This chapter describes the status of existing infrastructure within the NT, Darwin, East Arm, and the EAW precinct, as it relates to the proposed expansion of the EAW. Specifically, the purpose of this chapter is to describe the existing EAW transport networks, infrastructure, water supply and wastewater services, and to identify any constraints existing infrastructure and transport impacts may impose upon the proposed EAW expansion.

New infrastructure requirements, including details of upgrades to existing facilities and networks, as well as corresponding approval requirements are also described. It is noted that the individual main components of the proposed development are detailed in Chapter 2.

5.1 Existing Infrastructure

5.1.1 Rail

Services

The AustralAsia rail link between Adelaide and Darwin was completed in September, 2003 with first freight and passenger trains arriving early in 2004 (DPC, 2011e). Currently, five general freight train services are operated to and from Darwin each week by GWI (see also Section 2.2.3), whilst the Great Southern Railway operates two return trips each week by "The Ghan" passenger train. Both the freight train and passenger train services operate between Adelaide and Darwin.

The Ghan passenger service stops at the Darwin Passenger Rail terminal, approximately 1 km north east of the EAW precinct. Freight trains continue past the Darwin Passenger Rail terminal and enter the EAW precinct to unload their freight.

Bulk transport

Where the rail line enters the EAW precinct, a 1,500 t/h rail dump facility is installed for transferring rail-transported ore (iron ore, manganese and copper concentrates, and phosphate rock) from bottomdumping rail carriages to a conveyor system (refer Figure 5-1). The conveyor transports this dry bulk material to existing ore-specific stockpiles, located to the south east of the rail line. The unloading infrastructure has the capacity to handle 25 ore trains per week, and is currently operating at a rate of eleven trains per week (DPC, 2011e).

Dry bulk materials are not currently loaded onto rail freight vehicles at EAW for transport out of the facility by rail; all transport of dry bulk imports out of EAW is by road (Section 5.1.3).

Containerised freight

In addition to dry bulk rail freight, EAW has facilities for container rail freight. Rail container freight deliveries continue past the rail dump facility to the terminus of the rail line, near the western-most tip of the EAW. This area has cranes for unloading container deliveries from incoming freight trains, and a container storage facility.

From the container storage facility, containers are transferred to the ship container loading facility, which features a rail-mounted portainer crane. These cranes are also used for unloading container freight. Incoming containers are transferred to the container storage area, prior to being loaded on trains or trucks at the container loading / unloading facility.



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Constraints

The major constraint to operation of the rail line at EAW is the current one way in-out rail access to East Arm peninsula. The 'one way in-out' design restricts the ability of rail cars and trains to manoeuvre within the EAW precinct, and also restricts the number of trains which can enter the precinct and be loaded / unloaded at any given time (refer Section 2.2.3). As dry bulk handling has increased, access to the EAW is becoming inefficient, with excessive shunting required. This is a time consuming process, which reduces rail loading / unloading capacity of the EAW.

Other current constraints on the number of rail movements and volume of freight transported along the Adelaide-Darwin rail line are road / rail crossings and rail passing loops. All Adelaide-Darwin line road / rail crossings in the NT are currently level crossings. An increase in the number of rail movements, or in the average length of trains, has the potential to interrupt local traffic flows. The interruptions to regional traffic flows would be minimal and acceptable due to low traffic density, but in the more densely populated Darwin region there is the potential for significant traffic impacts.

Planned Infrastructure Upgrades

To reduce the impact to traffic of increased rail use, the extension and upgrade of Tiger Brennan Drive will incorporate the conversion of two level crossings to grade-separated crossings (AustralAsia pers. comm. 4 November 2010). These will comprise a grade-separated interchange over the extended Tiger Brennan Drive and a rail overpass on Berrimah Road near the existing weigh bridge. The grade-separated interchange and rail overpass are currently under construction.

The Adelaide-Darwin rail line at present includes only four passing loops between Alice Springs and Darwin. If rail activity increases in the future the limited number of passing opportunities has the potential to restrict growth due to potential limitations for transporting goods along the rail line. No additional loops are currently planned but would be investigated by AustralAsia if warranted by future growth in rail activity (AustralAsia pers. comm. 4 November 2010).

Regulatory Regime

Arrangements for access to the Adelaide-Darwin railway are provided under the AustralAsia Railway (Third Party Access) Code, which is a Schedule to the *AustralAsia Railway (Third Party Access) Act* 1999, and is enacted by the NT and South Australian (SA) governments (NTG, 2006). The regulatory arrangement by which access is able to be achieved is administered by the Essential Services Commission of South Australia (ESCOSA).

The access regime in the above Code has been certified as an effective State regime in accordance with section 44N of the *Trade Practices Act 1974*. It is a registered open access regime, with access negotiated by the owner / operator (GWI) and interested parties. Access agreements are subject to a range of conditions including fair remuneration. Environmental requirements for all rail users are set out by the EMP under which GWI operates (AustralAsia pers. comm. 3 February 2011).

Operations at the interface between the railway line and EAW port facilities are carried out under control and regulation by DPC. This includes operation of the loaders and unloaders, storage facilities, and conveying / transport of materials (AustralAsia pers. comm. 3 February 2011).

Companies involved in the rail industry (provision of rail infrastructure, rail services and maintenance and train operators) must be accredited under NT and / or SA Rail Safety Acts (NTG, 2006).

5.1.2 **Ports**

Port facilities in the vicinity of Darwin operated by DPC in addition to the EAW include Fort Hill Wharf, Stokes Hill Wharf, Fisherman's Wharf, and Frances Bay Marina (refer Figure 5-2).

Fort Hill Wharf provides berthing facilities for cruise ships and Defence vessels (both Australian and international), and includes a purpose-built cruise ship terminal that has been added to the precinct. The terminal is a modern air-conditioned facility with a covered walkway to the wharf deck. It is capable of handling complete passenger changeovers for smaller cruise vessels whilst providing a transit lounge for the more infrequent larger international cruise ships (DPC, 2011a).

Frequent naval ship visits to Darwin are catered for at Fort Hill Wharf, including through the provision of a dedicated amphibious vehicle landing berth. The DPC facilitates these calls through providing secure and efficient port facilities and services. Fort Hill Wharf also provides berthage for tugs and pilot boats used within Darwin Harbour (DPC, 2011a). Refueling trucks use Fort Hill, and the wharf includes refueling pipes.

Stokes Hill Wharf is primarily a historical tourist precinct with a number of dining facilities on the wharf itself. Harbour cruise vessels moor at the wharf, with facilities provided to embark and disembark passengers. Stokes Hill wharf remains a working wharf for smaller marine industry users and large cruising yachts, and also is a popular fishing area (DPC, 2011b). An extensive rehabilitation program at Stokes Hill wharf is currently underway.

Fisherman's Wharf is a 200 m long wharf used to fuel vessels (it includes a refueling facility) or work cargo, located adjacent and to the east of Frances Bay Drive. This wharf can cater for up to eighteen 30 m vessels. Public toilets and showers are also provided. Adjacent to Fisherman's wharf is a floating pontoon called Hornibrooks Wharf, which caters for smaller fishing vessels (DPC, 2011c).

The Frances Bay Marina is a basin provided primarily for commercial fishing vessels, located approximately 300 m north of Fisherman's Wharf. The basin is tide free with access through a 35x15 m lock. 85 berths are provided catering for vessels up to 30 m. Amenities include showers and toilets (DPC, 2011d).

A marina located at Cullen Bay, approximately 2 km North West of the Darwin CBD, is not operated by DPC. It has berths for over 250 mostly private vessels, and facilities include yacht maintenance services, internal slipway, external fuelling station, and waste pump-out facilities. The water way features a lock to provide protect from waves and all tide access (Cullen Bay Estate, 2007).

The EAW provides 754 m of wharf quay line, approximately 18 ha of hardstand area, and a single rail line spur linking the wharf to the Adelaide-Darwin rail line. The facility can accept vessels up to 80,000 t and comprises a bulk liquids berth, a common user facility, a container facility and a bulk loading berth (DPC, 2011e).

In 2010 the EAW serviced 178 general cargo (container) vessels, and a total of 1642 trading vessels (import and export) visited the facility. Over 3 Mt of dry bulk material was exported, and over 1 Mt imported. The common user berths are also heavily utilised by offshore oil rig tenders. In 2010 approximately 200,000 t was imported and exported by rig tenders.







Constraints

The primary growth areas foreseen by the proponent are dry bulk exports and rig supply tender movements.

The existing rail dump facility has a maximum operating capacity of 1,500 t/h. Overall, the current unloading infrastructure has the capacity to handle 25 ore trains per week, while the bulk ship loading facility with a capacity of up to 2,000 t/h. The rail-mounted portainer crane has a heavy lifting capacity of 70 t at 10 m outreach (DPC, 2011e).

Planned Infrastructure Upgrades

The planned upgrades to EAW infrastructure are discussed in Chapter 2. Currently there are no immediate, short term port infrastructure upgrades planned for the Port of Darwin and the EAW, other than the proposed MSB, barge ramp and the tug and small vessel berths presented in this DEIS.

The EAW Master Plan 2030 (GHD, 2009) and the EIS prepared for the present EAW (Acer Vaughan, 1993a) indicate future development of the port by extending the existing wharf to accommodate additional berths for cargo vessels.

Regulatory Regime

EAW and DPC are regulated by the DPC Act, which enacts the establishment and operation of the DPC, establishment and operation of the DPC Advisory Board, property, finance, reports and control and management of the port. Additional NT by-laws govern operation of the DPC, including *Port By-Laws* and *Darwin Port (Handling and Transport of Dangerous Cargoes) By-Laws*, as well as the *Commonwealth Maritime Transport and Offshore Security Act*.

The DPC is responsible for the administration of the DPC Act and subordinate legislation, with the DPC's Port Management Group responsible for the governance obligations of the Corporation. It is supported in its role by the Advisory Board.

The Advisory Board's role is to provide advice to the Corporation on strategic matters referred to it by the Chief Executive Officer. In considering its advice, the Board must take a generally commercial approach but must also have regard to Government strategic objectives, which are to:

- Grow trade
- Develop workforce capability
- Achieve financial viability
- Provide a safe working environment
- Be environmentally responsive
- Be innovative.

5.1.3 Road

The EAW is an important inter-modal (rail, road and marine) transfer facility and transport hub for the NT, Australia, and South East Asia. The key roads that cross the rail line in the vicinity of the project area include Berrimah Road, Wishart Road, Channel Island Road, Finn Road and Cox Peninsula Road (refer Figure 5-3). These roads are generally sealed, two-lane, two-way, single-carriage roads, and provide sub-regional connection to Darwin.



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Berrimah Road is the sole direct road link and primary access to the EAW port facility and to the Darwin Business Park and Darwin Railway Passenger Terminal. It links EAW to the Stuart Highway, and also intersects Tiger Brennan Drive and Wishart Road (refer Figure 5-3). A traffic study by URS (2010) found that utilisation of the southern end of Berrimah Road by commercial vehicles is high (28%).

The majority of imported containers containing general cargo are distributed by road – in 2010 this equated to approximately 134,000 t of general cargo (DPC pers. comm. 3 February 2011). Dry bulk freight, mainly cement clinker, is also unloaded and transported by road from EAW.

Liquids (mainly fuels) are also imported to EAW, which impact road transport loads. In 2010 approximately 1 million kL of fuel was imported to the bulk liquids berth. This 157 m berth handles regular imports of fuel, and the usage rate of the berth remains high. Liquids are emptied from tanker ships using arm-mounted pipes, and then piped to the nearby Vopak fuel storage and distribution facility (DPC pers. comm. 3 February 2011). Chemicals such as acids are also piped to adjoining areas. Road trains then transport the chemicals by bulk to Darwin and regional areas (not by rail).

Livestock for export is transported to EAW by road, which increases local road traffic loads. Live cattle exports have increased significantly over the past few years with 360,000 head (177,000 t) exported in 2010, and ongoing increased demand is expected (DPC pers. comm. 3 February 2011).

Constraints

The condition of Berrimah Road is poor in parts but the Federal and NTGs are jointly funding upgrades to the East Arm Port access route, as well as other local roads, which will further enhance the capacity of these important access routes to cope with increased traffic volumes.

Planned Infrastructure Upgrades

In 2008, the NTG in partnership with the Commonwealth, allocated \$110 million to extend Tiger Brennan Drive (refer Figure 5-3) and upgrade rail interchanges. The new road is to include a flyover and a 7 km road extension to the Stuart Highway. The extension of the Tiger Brennan Drive is considered an important infrastructure project in that it supports the economic opportunities of EAW, by providing better access for trucks and trains to deal with increased transport and freight volumes.

Additional upgrades to local road infrastructure, which are either planned currently underway, include the duplication of Berrimah Road between Tiger Brennan Drive and Wishart Road and constructing a rail overpass on Berrimah Road near the existing weigh bridge (refer Figure 5-3). These works will enhance freight capacity between Darwin, Palmerston, and rural areas by reducing congestion and providing a direct link to East Arm Port.

Regulatory Regime

Public road infrastructure in the NT is regulated under the *Control of Roads Act* (the Roads Act). The Roads Act lists the powers of the Minister for Lands and Planning, including the opening and closing of roads. Under the Roads Act, the DLP manages the road network and undertakes a variety of activities to provide a broad range of road services to the NT Community. The Transport Policy Division provides policy and legislative advice and development services to the DLP and other departments of the NTG.



Overall, development planning priorities for the NT are set out in the Economic Development Framework whilst the Department of Lands and Planning's Road Network Division is responsible for developing and administering policy regarding access to and use of the NT road networks. The key pieces of legislation involved in this are:

- Control of Roads Act
- Motor Vehicles Act
- Traffic Act.

In addition to the above, road projects must comply with the requirements of other NT (and Australian) legislation; particularly those concerning environmental and heritage matters. Environmental aspects of road construction and operation, and their management, are generally regulated by various NT and Commonwealth environmental legislation.

5.1.4 Air

Darwin International Airport (DIA) is a curfew-free domestic and international airport located approximately 7 km north of EAW. It is a joint user airport (civil and military), and comprises a 215 ha military area, and DIA Pty Ltd operating a 311 ha leased site for civil activities (DIA, 2010).

DIA has two runways. The design aircraft for the main runway is a Code 4E aircraft, which allows for Airbus 330 and Boeing 747 / 777 / 787 type aircraft. The design aircraft for the secondary runway is a Code 3C aircraft. This allows for Fokker 100, Bombardier Q300, SAAB 340, and other general aviation aircraft types. The Airbus 380 is classified as a Code F aircraft. Although it is not expected that Code F aircraft will operate regularly into Darwin there is the possibility for Code F diversions and cargo operations. Such Code F usage operates under dispensation and Code E aircraft will remain the critical design aircraft size for DIA (DIA, 2010). Various Defence aircraft also operate at DIA.

Aprons at DIA include the Regular Public Transport (RPT) apron, for scheduled commercial airline activity, and the General Aviation (GA) apron for usage such as charter, aero medical, agricultural aviation, aviation-based fire-fighting, training, photography, and surveying operations (DIA, 2010).

In addition to the DIA, the other major NT airports (those catering for jet aircraft operations and interstate flights) are located at Alice Springs, Ayers Rock, Nhulunbuy and Groote Eylandt. These airports are all privately operated.

Constraints

The current RPT apron can accommodate up to 14 large aircraft in various combinations. There are three GA areas providing approximately $89,000 \text{ m}^2$ of hangar space and $74,000 \text{ m}^2$ of parking space (DIA 2010).

The capacity of the DIA runway system is approximately 200,000 movements per year, and it is estimated that by 2030 there will be approximately 143,000 movements per year. The existing runway system is therefore considered adequate to cope with any increase in activity associated with the proposed development.

Planned Infrastructure Upgrades

A two phase upgrade of the terminal is currently underway. Phase 1 comprises a \$7 million expansion of the domestic terminal, with completion expected during 2011. It is anticipated that Phase 2 of the

expansion, which includes significant upgrades to common use and international facilities, will be completed by 2014. The upgraded terminals will be sufficient to support any increased usage associated with the proposed development.

Upgrades to the taxiways and RPT apron are planned to support a projected increase in movements. Any increased demand for GA facilities associated with the proposed development would be developed on a commercial basis as required. Sufficient land is available for significantly increased GA facilities should it be required (DIA, 2010).

Regulatory regime

The Commonwealth leased airports at Darwin and Alice Springs are subject to the master planning regime under the *Airports Act*. Commonwealth leased airports are not subject to State/Territory planning, ensuring that there is no inappropriate non-aviation development on airport land.

5.1.5 Water Supply

Mains water supply services for East Arm are provided by Power and Water Corporation (PWC).

Darwin's water supply has three water sources. Darwin River Dam accounts for around 90% (110 ML/day) of the water supplied by PWC to Darwin for potable use. The combined McMinns and Howard East borefields contribute some 10% of supply to Darwin, comprising a total of six bores, with a capacity of around 25 ML/day. Manton Dam provides a back-up water supply if required.

Primary mains water supply to the EAW precinct is provided by a DN600 water main, which was commissioned in 1997. This DN600 mains pipe runs within the Berrimah Road corridor from a storage tank at Karama to EAW. It currently extends to the south western tip of Berrimah Road (refer Figure 5-4).

Constraints

The Karama – EAW mains pipe has capacity of approximately 400 L/s. This is sufficient capacity to service the current EAW precinct, and it is anticipated that it would be sufficient to supply the demands of the proposed EAW expansion. The predicted additional demand of the expanded wharf and associated facilities will be provided to PWC for modelling to confirm if the current mains pipe is of sufficient capacity. If this modelling indicates that additional capacity is likely to be required, an additional mains supply pipe would be constructed.

Planned Infrastructure Upgrades

Although capacity of the current mains supply pipe is likely to be sufficient for the proposed expansion, security of water supply and water quality is limited by only having one supply pipe into EAW. In the future another main (probably a DN450) may be constructed and looped back to provide supply security. However this upgrade is unlikely to be warranted until more land is developed.



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Regulatory Regime

Water resources, including both surface water and groundwater, are administered under the *Water Act* by the Natural Resources division of DPI. Under the *Water Act*, water resources may be designated to an area known as a water control district. There are six water control districts in the Territory, covering resources in the vicinity of Darwin, Katherine, Gove, Tennant Creek, Ti-Tree and Alice Springs. The allocation and usage of water resources within a water control district are subject to a prescribed allocation plan, and may include specific conditions including licensing.

Any bore constructed for the extraction of groundwater requires a licence, which is issued by the Controller of Water Resources. The applicant must specify the intended use and estimated volume of water to be extracted. However, subsequent monitoring or reporting of extraction rates by approved users is generally only required for bores delivering more than 15 L/s. As a result of uncontrolled groundwater extraction, some areas are currently considered to be at risk of over use and excessive draw down.

Extraction of surface water from natural water bodies also requires a licence issued by the Controller of Water Resources. As for groundwater extraction, applicants must specify the intended use and estimated consumption.

5.1.6 Waste Water

Sewerage system services for East Arm are provided by PWC.

The existing Darwin Region Sewerage System comprises six sewage collection, treatment and disposal systems which serve an existing population of about 100,000 Equivalent Persons (EP). These are Larrakeyah, Ludmilla, Berrimah, Leanyer, Palmerston, and Humpty Doo. Pump stations throughout the network transport collected sewage from low-lying areas to treatment ponds. This primary effluent is then disposed to Darwin Harbour via a shallow outfall near East Point.

The East Arm Wastewater Treatment facility has been established specifically to treat high retention time sewage arising from the heavy industrial areas of East Arm. This system is operated as part of the Berrimah wastewater treatment facility. The waste water infrastructure at EAW is shown in Figure 5-5.

Constraints

The existing sewer infrastructure at EAW is nearing capacity, and will be at capacity or very close to capacity once all of the allotments in the current business park subdivision have been developed. Extensive upgrades to sewer infrastructure are therefore necessary for the proposed development.

Planned Infrastructure Upgrades

Development of sewerage infrastructure in the area planned by PWC includes significant upgrades of pumps, sewer rising mains, and other assets. PWC is also planning to build a sewage treatment plant in the East Arm area, to the east of the Business Park.

A discharge licence for the proposed plant has not yet been obtained, and at the time of writing PWC intends to discharge at the Berrimah sewer farm discharge. There will be no requirement for operators of the MSB to have their own waste water systems or waste water pre-treatment systems.



Regulatory Regime

The discharge of liquid wastes (including sewage or treated effluent) to the environment comes under the jurisdiction of the *Water Act*, and requires a licence under the Act. The issue and administration of licences are carried out by the Office of Environment and Heritage, as a delegate of the Controller of Water Resources. Licence conditions are at the discretion of the NRETAS on a case-by-case basis.

The disposal of solid waste, including sewage sludge, is required to meet the conditions of the *Waste Management and Pollution Control Act*, which is also administered by the NRETAS. Re-use of onsite wastewater must be performed in accordance with the requirements of the Department of Health and Community Services (1996). All PWC reuse schemes are individually reviewed and approved by the DHF.

5.1.7 Electricity

The majority of Darwin's electricity is generated at the Channel Island Power Station and distributed by PWC. The Channel Island plant is a duel-fuel gas turbine power station. It is the NT's largest power plant, generating 232 MW. The second largest power station is Weddell, which also supplies Darwin (and Katherine). It currently generates 88 MW, and a third gas turbine is scheduled for installation at the site in 2011-12. Back-up power is provided by the Berrimah gas power station.

Large industrial consumers such as Alcan, Gemco, and ERA generate and distribute their own electricity.

There are two 11 kV feeders into the East Arm area. The primary feeder to the EAW is an underground cable. The secondary feeder comprises a combination of underground and overhead cables. The feeders are arranged in a general 'ring' shaped layout and incorporate several radial offshoots, as well as various other ties between the feeders (refer Figure 5-6).

Constraints

The current total loading on the two EAW feeders is approximately 5 MVA. PWC consider that additional loading of up to approximately 3 MVA would be possible, allowing for backup (Christina Camilleri [PWC] pers. comm. 5 November 2010).

The two East Arm feeders run from the Berrimah substation to EAW. Various developments between Berrimah and EAW, in addition to the proposed EAW expansion, are currently underway, and will be connected to the two East Arm feeders. These developments will place additional demands on the two East Arm feeders, which may reduce the available capacity. In addition to the currently confirmed developments, it is likely that additional developments will be confirmed prior to completion of the proposed EAW expansion.

There are no physical constraints limiting the provision of additional electricity infrastructure between Berrimah and EAW, and the costs of any additional infrastructure required in the future would be shared between users, in accordance with PWCs' Distribution System Extension Policy.



Planned Infrastructure Upgrades

In light of the developments additional to the proposed EAW expansion, it is not currently possible to confirm whether the currently available excess feeder capacity will be sufficient for all new developments. PWC currently has no plans to provide additional electricity infrastructure between Berrimah and EAW. However, as new developments are confirmed, PWC will reassess the need for additional power supply infrastructure.

Regulatory Regime

The electricity industry in the NT operates within regulatory and institutional arrangements principally determined by the provisions of the following legislation:

- Electricity Reform Act (Reform Act)
- Electricity Networks (Third Part Access) Act (Networks Act)

5.1.8 Gas

Natural gas supply in the NT is managed by NT Gas, and gas distribution in Darwin is provided by NT Gas Distribution, a fully owned entity of NT Gas. NT Gas Distribution owns the gas distribution and reticulation systems, and operates a 19 km long low pressure gas pipeline in the Darwin area (NT Gas, 2011). There is no domestic gas supply in Darwin.

Mains natural gas supply is currently provided to East Arm extending as far as the Vopak fuel storage and distribution facility. Infrastructure for mains gas supply does not currently extend into EAW. It is not anticipated that mains gas supply will be required for the proposed development.

5.1.9 Telecommunications

Telecommunications services at the EAW are provided by infrastructure owned by Telstra. Landbased telecommunications is provided by a combination of optical fibre and copper cable systems.

Some allotments are connected by optical fibre directly to the Berrimah Road optical fibre system. Other allotments are connected to the copper cable system, which is routed through a substation and then connected to the Berrimah Road optical fibre system.

A base transceiver station (commonly referred to as a mobile phone tower) has been constructed by Telstra at Hudson Creek, which is within the EAW precinct. This tower provides mobile telecommunication services for the entire EAW precinct.

Constraints

The telecommunications infrastructure currently in place at EAW is sufficient for the current number of users, and has been designed with excess capacity should the facility be expanded. If the expansion is of sufficient scale that the capacity of the Berrimah optical fibre system is exceeded, upgrading of the optical fibre system to EAW can be undertaken relatively easily and quickly.

Upgrading would involve additional optical fibres being installed within the existing Berrimah road conduit; additional allotments would be then connected as required. If required, additional fibre capacity could also be connected to the Hudson Creek base transceiver station, and additional transceivers installed, to increase mobile phone capacity.



Planned Infrastructure Upgrades

The fixed telecommunications line linking the EAW precinct (including the Industrial Park) to the greater fixed line telecommunications network comprises a carrier grade single mode optical fibre. This optical fibre was recently upgraded to a single mode type. Single-mode fibres allow longer, higher-performance links, than multi-mode fibres. The conduit for this optical fibre runs within the Berrimah Road corridor, and extends into the EAW site.

Regulatory Regime

Telecommunications are managed and regulated in the NT by the Department of Business and Employment (DBE). Entities in the NT must also comply with Commonwealth legislation governing Australian telecommunications (the *Telecommunications Act, 1997*).

5.2 Potential Impacts

5.2.1 Roads

It is intended that the EAW will remain operational throughout the construction phase of the proposed development. Construction materials and equipment will largely be delivered by road, with some exceptions such as work boats and barges travelling to the site by sea. Disruptions to road access will therefore potentially impact upon site operations and also on construction of the proposed development.

As discussed previously in Section 2.6.2, some disruption to site access and local traffic is inevitable during the construction phase of the proposed development. All construction works will be carried out within the EAW precinct, however, thus impacts on external roads impacts will be limited to increased traffic. In particular, traffic on the main access road to East Arm (Berrimah Road), and also Wishart Road and Tiger Brennan Drive, will increase during the construction phase of the proposed development, especially heavy vehicle traffic.

In this respect it is noted that East Arm is an industrial precinct, and local road infrastructure has been designed and constructed to cope adequately with construction activities at the scale of the proposed development.

Significant quantities of hard rock and riprap (for armouring), will require transport from quarries located at Mount Bundy (100 km east of Darwin along the Arnhem Highway) and Katherine (300 km south of Darwin along the Stuart Highway).

The Arnhem Highway carries mostly light vehicle traffic, but the heavy vehicle traffic on Arnhem Highway also includes freight trucks and other vehicle servicing the Ranger uranium mine. The road is subject to flooding in the wet season and can be closed in parts for periods of several days. The Stuart Highway links Darwin to other Australian cities, and carries all classes of traffic. It is well surfaced and graded, and is not prone to flooding even in the wet season, although closure does occur occasionally.



5.2.2 Rail

Although the proposed rail loop will be constructed adjacent to the existing rail lines, the majority of construction activities will be occurring at a sufficient distance from the existing line that the rail corridor will not be intruded upon. There is also sufficient space within the alignment of the proposed rail loop for a work zone to be established that would service construction of the loop, and not intrude upon the rail corridor in any way (although the access route to the work zone would necessarily cross the rail line).

As discussed previously in Section 2.6.3, part of the current container storage area adjacent to the container loading / unloading berth will be utilised temporarily for construction work zone of the wharf quay line extension. During this time some minor disruptions to rail container loading / unloading may be experienced as a result of less space for container storage.

5.3 Management of Potential Impacts

5.3.1 Road

Local traffic management measures will be implemented during construction to ensure that any traffic disruptions are kept to a minimum.

The existing stockpiling areas on the opposite side of Berrimah Road to the proposed barge ramp and hardstand will be used as a temporary work zone (fill / armour stockpiling, equipment storage, vehicle turn-around) until the hardstand and MSB construction sites are developed sufficiently, and can be further utilised for construction activities.

5.3.2 Rail

A section of the loop extension (the eastern section) will however be constructed adjacent and in close proximity to the existing railway line within the EAW precinct. Construction of this section would be staged to minimise the disruption to rail operations. Delays would be limited in duration, however, as it will be possible to use one of the lines within the site at all times.

5.4 Commitments

- Local traffic management measures will be implemented during construction to ensure that any traffic disruptions are kept to a minimum.
- Existing stockpiling areas would be used as temporary work zones until the hardstand and MSB construction sites are developed sufficiently that they can be further utilised for construction activities, to minimise impacts to roads and road users.
- Stage construction of the rail loop section adjacent to the existing railway line to minimise the disruption to rail operations.



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