PROJECT NEED AND ALTERNATIVES

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2. PROJECT NEED AND ALTERNATIVES

This section describes the background leading to development of the project in its current form including the market requirements and the local, regional and State benefits of the commitment to improving facilities for the cruise shipping industry. A justification of the project is provided in terms of the project design, the availability of sites for location of the project and feasible alternatives that were considered.

2.1 Project Justification

The proposed TOT development delivers a critical infrastructure asset consistent with the requirements of the Queensland Cruise Shipping Plan 2003. The potential benefits to the region's tourism sector are significant, with annual contributions to Gross Regional Product estimated to be $4.7m arising from the ocean terminal itself. The operations of the ocean terminal have the potential to create some 55 full-time equivalent jobs in the region.

Additional cruise ship visits will create demand for recreational services offered by the nearby Jupiters Townsville Casino, as well as demand for recreational and retail services found the in the CBD. Similar benefits can be expected from visits by naval vessels.

There is a strong need for additional recreational marina facilities in North Queensland. Existing supply falls well short of known demand for marina berths. There also is a need for superyacht facilities in North Queensland. The proposed superyacht berths at the TOT will complement existing facilities in Cairns and the Whitsundays.

There is strong consumer demand for waterfront residential opportunities, such as those proposed at Breakwater Cove. Water front property prices in Townsville have experienced above-average growth for at least the last five years, reflecting strong interest and demand for living in this part of Townsville. The recent sales success of Mirvac's nearby The Stanton Apartments at Mariner's Peninsula development reinforces the existence of strong demand for waterfront residential opportunities in Townsville.

The project is expected to act as a catalyst to further development of the region's marine industry. Opportunities for growth relate to ship maintenance and repairs as well as marine-based cruise tourism operations.

The TOT project includes provision for 1,500m^2 of retail space. The retail offer is likely to meet the immediate needs of Breakwater Cove residents as well as attract customers from throughout the city. Tourists particularly from cruise ships will also benefit from the retailing offered in the precinct.

Overall the project is expected to involve a capital injection into the regional economy of $209 million over a construction period of 3 years. An estimated 1,900 full-time equivalent jobs will be created by the project directly and indirectly. On site, the project is expected to employ some 200 workers. Once operational, the ocean terminal is forecast to create a maximum of 55 full-time equivalent jobs in the region, directly and indirectly.

From a social perspective, the project has a range of benefits including:

- Provision of additional recreational open space for public use;
- Provision of improved recreational fishing facilities for public use;
- Demonstration of Townsville's maturity as a regional city;
- Enhancing Townsville's reputation as a relaxed, tropical city;

- Reinforcing Townsville's sense of place as a tropical, port city; and
- Driving economic diversification that will create employment opportunities into the future.

The following Scorecard of anticipated social impacts arising from the construction and operation of the Townsville Ocean Terminal and Breakwater Cove residential precinct has been prepared based on detailed findings of the Social Impact Assessment Report. The Scorecard is a summary of key impacts.

Social Impacts Scorecard

Anticipated Positive Impacts	Potential Adverse Impacts*
Enhanced public amenity on the new breakwater in the form of public open space and continuation of the Strand via the new pier. Additionally the extended northern pier is conceived with dedicated fishing opportunities for recreational angling usage.	Potential adverse amenity impacts on existing nearby residents during construction, particularly residents living at #1, 3 and 7 The Strand and on Sir Leslie Thiess Drive who will be impacted by increased traffic movement resulting from material haulage to the project site. This involves some 120 dwellings.
The project is expected to result in enhanced public perceptions of Townsville as a mature, dynamic and progressive city. The community survey confirms that the majority of greater Townsville residents are favourable towards the proposed development and its impact on the city's reputation and residents' 'sense of place'.	Future Breakwater Cove residents' amenity may be impacted due to proximity to operating Port. In particular noise and odour impacts arising from port activities may impact these residents. Anticipated noise impacts are expected to be within acceptable limits or can be mitigated within the design of the dwelling. Odour impacts, particularly during movement of live cattle, are expected but can be mitigated to some extent through appropriate building design. Odour and noise impacts are also expected to be seasonally variable given changes to prevailing wind directions.
Reinforces public perceptions of Townsville as a tropical, relaxed maritime city.	Future Breakwater Cove residents' amenity may be impacted by proximity to the Ocean Terminal. The main source of impact will be noise associated with docked vessels. These impacts are capable of being mitigated.
Employment created by the project – both during construction and future operations – is expected to enhance lifestyles of residents into the future.	Public access to the existing Breakwater will be prohibited during the project's 3-year construction period.
The project can potentially improve Townsville's reputation as a desirable residential destination and contribute the city's competitiveness in attracting and retaining skilled workers.	
Additional Oceanside and marina residential opportunities are expected to meet evident needs and aspirations for this kind of 'active' residential lifestyle environment.	
The project is consistent with the values shared by the majority of greater Townsville residents of sustained economic opportunity and security for the region into the future.	

*Note: identified potential impacts are addressed through detailed mitigation measures outlined in the specialist reports and elsewhere in this EIS document.

2.2 Compatibility with the Port of Townsville

The EIS has investigated the compatibility of the project, particularly the Breakwater Cove precinct, with the existing and future operations of the Port of Townsville. The assessment considered the future expansion and operations of the port to 2050 including capital works, dredging and growth in throughput over existing and proposed new berths.

2.2.1 Emissions associated with port operations

Potential nuisance and amenity impacts within the Breakwater Cove precinct associated with current and future port operations relate to:

- Noise;
- Emissions;
- Dust; and
- Traffic.

These nuisances and impacts are affected by climatic conditions, in particular the direction of prevailing winds:

- In summer the winds tend to be north-easterly (bypassing the project site for a significant proportion of port activity and to some extent downwind from existing and future outer-harbour berths); and
- In winter the winds tend to be south-easterly.

Existing emission sources include the loading and unloading of:

- Bulk cement, scrap metal, minerals and ores;
- General cargo and containers;
- Motor vehicles and live cattle;
- Frozen beef, raw sugar, molasses and fertiliser;
- Passengers and luggage; and
- Discharge of bulk liquids and fuel oil bunkering.

Noise Impacts

Noise emanating from these activities include handling equipment (e.g. forklifts), transport movements such as trucks, trains and ships (engines, tugs etc.), and reversing and moving alarms.

An acoustic impacts assessment was conducted by Hyder Acoustics to evaluate, among other things, the potential impact of the Townsville Port on Breakwater Cove residences.

As part of this assessment, two weeks of data logging was recorded at a variety of receptor locations in and around the project site. The most relevant to the TOT residential precinct was the logger external to the Jupiters Casino. Over the period of the logging, ship traffic was higher than average and marginally below the highest density for the year according to the Port's records.

The purpose of the noise logging was to ascertain and describe the existing noise environment at locations considered representative of the proposed development.

To this end, measured noise levels immediately external to the Casino have been used to represent (with some adjustments) those at the Breakwater Cove residences.

Criteria have been determined using planning noise levels from Qld EPA Planning for Noise Control Guidelines and the Specific Noise Assessment Objectives. These set:

- The maximum L_{Aeq} or average sound pressure for the classification of the area depending on its neighbourhood characteristics (in the case of TOT Z4).

- The background noise level (L_{A90}) being 3dBA above that measured outside the Casino.

From these noise factors the Project Noise Level Objectives have been determined as the ideal standard for the Breakwater Cove residential precinct.

The Port Users operate under a variety of approvals and licences which require compliance with EPA noise guidelines in accordance with their specific activities (ERAs).

Noise data showed the following levels at the Port of Townsville and Jupiters Casino during the period of monitoring:

L_{Aeq}	Townsville Port	Jupiters Casino
Day	71	56
Evening	64	53
Night	68	50

Source: Hyder Acoustics Report (Table 6)

The acoustic analysis has concluded that a number of port operations have the potential to produce noise that may exceed the noise levels experienced at the closest sensitive location, namely Jupiters Casino:

- Noise emanating from the Port Control Tower area (with potential exceedance of 1.2dB(A));

- Noise emanating from activities at Berth 10 (potential exceedance of 2.6dB(A) at the Breakwater Cove apartments and 1.1dB(A) at the detached dwellings); and

- Noise emanating from activities at Berth 11 (potential exceedance of 2.3dB(A) at the Breakwater Cove apartments and 2.7dB(A) at the detached dwellings).

Therefore, the acoustic analysis concludes that existing port operations are likely to generate noise impacts on Breakwater Cove that, at their worst, are predicted to be no more than 3dB(A) higher than what is presently experienced at the nearest noise receptors at the Casino. As such, they are likely to be either indiscernible or slightly discernible to future Breakwater Cove residents. Dwellings located further away from the sound source are likely to experience a lower noise level and will also benefit from the shielding offered by the 6m acoustic berm and fence and other buildings.

Air Quality Impacts

Port operations also have impacts on air quality. An analysis of air quality impacts of the Townsville Port on Breakwater Cove was undertaken by Air Noise Environment Pty Ltd (ANE).

The ANE assessment evaluated these impacts by referencing the extensive database of air quality data that is available for the project site locality. Monitoring data for particulates, oxides of nitrogen, sulphur dioxide and hydrocarbon measurements at positions representative of the project site was gathered from ANE monitoring, Port of Townsville monitoring and data from the EPA.

The EPA has recently published findings of an investigation of dust complaints from residents living in the Yarrawonga area. These complaints centred around the reported presence of high

levels of so-called 'black dust'. Some community concern exists that the 'black dust' is the result of Port operations.

The EPA investigation measured dust fallout and collected dust wipe samples from a number of residences in Townsville. Analysis of the samples confirmed that deposited insoluble dust levels at all five EPA monitoring sites were well within the criteria levels of 120mg/m^2/day. The monthly averages for the Yarrawonga residences range from 2-80% of the criterion, the sites between Yarrawonga and the Port between 10-60% and the background site between 2-80%. In all samples, the level of combustible matter was greater than 50%, indicating that a large proportion of the dust was organic matter.

Elemental and microscopic analysis of the samples was undertaken by ANE to determine the likely sources of the dust. This analysis indicated that the samples contained a predominance of mould spores, silica and silicate mineral grains. On this basis, it was concluded that the majority of dust was from non-industrial sources.

Air quality monitoring data for nitrogen dioxide (NO_2) collected at the EPA Pimlico monitoring station indicated that concentrations at this location are well below the ambient air quality goal and are considered typical of residential areas in Townsville. Nitrogen dioxide concentrations at Berth 10 at the Townsville Port were also assessed. The results confirmed that existing NO_2 concentrations at this location are well within the criteria level of 246ug/m^3 with a maximum 1-hour average NO2 concentration recorded during the monitoring period of 34.2ug/m^3.

The measured NO_2 concentrations at the Berth 10 monitoring location were correlated with Port activities for the measurement period. This comparison confirmed that only small increases of concentrations are observed when shipping activities occur at the nearest berth.

Sulphur dioxide concentrations were also measured. Data from 2000 onwards was assessed and measured concentrations were well below the ambient air quality goal of 570 ug/m^3 as a 1-hour average. These concentrations are considered typical of residential areas of Townsville. Project site monitoring shows that existing ambient air quality at that location complies with the SO_2 criteria of 570 ug/m^3 as a 1-hour average by a significant margin. The maximum 1-hour average SO2 concentration during the period between 11 August and 12 September 2007 was 45.9 ug/m^3, which represents only 8% of the ambient air quality goal.

Comparison of the measured SO_2 concentration at the Berth 10 monitoring station with Port activities indicated that there may be a correlation between measured concentrations and shipping activities at that Berth.

ANE undertook hydrocarbon monitoring at Berth 10. The results found that existing concentrations of non-methane hydrocarbons are low with concentrations at or below the instrument's limit of detection for the majority of the time.

The conclusion of this analysis of air quality and impacts are that the existing ambient air quality meets the appropriate air quality health risk values and criteria by a significant margin, with the exception of occasional exceedances of the NEPM PM_{10} threshold. These exceedances are noted by the EPA to be associated with regional events and are not specific to the project site.

The gaseous monitoring data collected from the Port of Townsville, when correlated with specific activities taking place at the Port, demonstrated that emissions from ship movements, docked vessels and loading and unloading activities at the nearest berths to the project site may result in measurable short-term changes to air quality; however, even during these periods measured concentrations are well within relevant ambient air quality criteria. Indeed, the ANE assessment found that ambient air quality at the project site is expected to be significantly better than that measured at Berth 10 in the case that the Port represents the dominant emission source for measured pollutants.

Air quality analysis has found that there are periodic odour impacts associated with the loading of live cattle, molasses during sugar season and diesel emissions. Impacts on Breakwater Cove are more likely during winter when winds tend to be south-easterly.

Lighting and Visual Amenity Impacts

Impacts on Breakwater Cove from lighting associated with the Port of Townsville were evaluated by Chenoweth Environment Planning (Chenoweth). The Chenoweth assessment found that:

- The separation distance between the Port and Breakwater Cove precinct is greater and is largely screened by the landscaped mound (acoustic barrier), such tat the 2-storey residential dwellings will have no view of the Port;
- Internally, the 3m mound and 3m acoustic barrier (plus tall trees) will diffuse and part-screen lights from the Port, terminal and any berthed ship, such that visual intrusion to the residential areas is minimised;
- Only the taller 5 and 9 storey buildings will be within view of the Port, but that most of these are well separated from the nearest Port docks and wharves, with the exception of the south-western 6-storey building adjacent to the proposed car park;
- All the taller buildings will be oriented and designed to take advantage of the main views to Cleveland Bay, the marina and the City, such that views southwards towards the Port are minimised; and
- The overall visual effect will be an increase in lighting which will add to the attractiveness of Townsville's nightscape, as seen from The Strand, Castle Hill and offshore, in that there will be more of a transition between the foreshore and the Port.

On the basis of this assessment the EIS concludes that:

- Breakwater Cove precinct will include areas close to the existing port operations, but the port has long been an accepted part of Townsville's foreshore character and its appearance has largely been accepted by Townsville's community; and that
- Any potential visual impacts on new residents will be minimised by the landscaped mound and fence and other screening measures.

Electromagnetic Radiation (EMR)

The potential for EMR impacts on the Breakwater Cove precinct arising from Port activities was assessed by EMC Technologies. The assessment measured radiofrequency Electromagnetic Radiation that currently exists in and around the project site. The assessment was undertaken while a US Naval Vessel was in Port.

Broadband measurements were carried out at a number of locations along the perimeter of the project site. These were performed on ground level along the existing breakwater barrier. Narrowband measurements with spectrum analyser and antennas were carried out at the project site with the highest reading from the broadband measures, in the frequency range of 30MHz to 2,900MHz to determine the cumulative Electromagnetic Energy and the contribution from various sources.

The assessment found that EMR:

- At no location where public access is allows did the levels exceed the general public exposure limit as specified in the ARPANSA RPS3 Standard;

- The EMR/RF levels measured during the survey are all relatively low compared to the ARPANSA limit, and would not be expected to pose a risk to either residential or businesses located within the TOT precinct;

- Poses a low risk potential to cause interference with electronic devices in nearby apartments; and

- Is unlikely to have an effect on wireless LAN, Bluetooth transmissions etc. as these are digital short range devices operating in close proximity to each other. Many of short range devices use frequency hopping technology (that is, utilise a number of frequencies within a defined band), so if there is a disturbance on one particular frequency these devices can pick the frequency next to it. These devices are built to work in environments with several other devices operating on similar frequencies.

The EMC Technologies assessment concludes that the risk of radiofrequency disturbance from the Port of Townsville having adverse impacts on residential and business activities within the TOT precinct is low.

Traffic Impacts

In terms of traffic impacts arising from the proposed project, analysis of the road network undertaken by Holland Traffic Consulting Pty Ltd showed:

- Capacity constraints at the Flinders/Denham Streets intersection at times;

- This is aggravated by special events at the Townsville Entertainment Centre causing higher than normal traffic movements to and from the breakwater;

- The TOT project will not materially impact the existing situation; and

- Sir Leslie Thiess Drive, the main feeder to the project site, is more than adequate to accommodate the TOT project.

Council's long-term traffic planning proposes a bridge across Ross Creek close to the breakwater as an extension of the Strand to Ross Street in South Townsville. The timing of this initiative is still to be determined.

Traffic modelling and analysis of existing standards of operations and performance indicators conclude that the existing network south of The Strand causes problems, rather than the Breakwater network (existing or proposed) itself.

The traffic assessment did not identify any adverse impacts on the future operations and expansion of the Port.

Impact of Future Port Operations

Future port operations include the expansion of Berth 10, upgrade of Berth 4 and extension of Berth 8 in the inner harbour, and the construction of new Berths 12 and 13 in the outer harbour. These developments may include dredging, reclamation, pile driving and additional truck traffic etc.

Noise

The potential impact of future port operations on the Breakwater Cove precinct were modelled using SoundPlan, a proprietal software package. A number of situations were modelled to represent an estimate of a worst case scenario of port operations. The situations that were modelled were:

- Loading and unloading activities on Berth 10;
- Impact noise from dropping containers etc. on Berth 10;
- Loading and unloading activities on Berth 9;
- Impact noise from dropping containers etc. on Berth 9;
- Dry cement ship loading/unloading on Berth 4;
- Impact of unloading activities on Berth 3;
- Sugar train movement;
- Ships horn; and
- Haulage truck movements within the port facility.

The modelling assessed the impact of noise impacts from these activities on a number of locations within the Breakwater Cove precinct. These locations included the multi-level unit dwellings at the southern end of the precinct through to the detached dwellings located throughout the remainder of the precinct.

The modelling results indicate that individual noise impact from each of these situations is generally within the external design emission guidelines for the three time periods: daytime, evening and night. The exceptions were:

- Berthing and operation of the car carrier ship (maximum level of 68 dB(A) at the nearest multi-level dwelling) with consequent predicted exceedance of the night time criterion of 8-18 dB(A); and
- Operation of the ship horn (maximum level of 76 dB(A) at the sixth floor of the multi-level dwellings and up to 70 dB(A) at the northern façade of the Casino), with consequent predicted exceedance of the night time criterion of 23-26 dB(A).

Any capital works that are undertaken by the Port as part of its future development and expansion would be required to comply with a range of relevant environmental standards, including those covering noise impacts. It is anticipated that should these standards be met, noise impacts arising from likely capital works would be within appropriate criteria.

Air Quality

ANE assessed the potential air quality impacts arising from future Port development and growth.

In terms of future activities, air dispersion modelling results show that the maximum predicted ground level pollutant concentrations are below the relevant criteria.

In terms of future growth, this assessment concluded that:

- Future uses of the proposed marine industries and boating facilities precinct will include shipbuilding, ship repair, commercial fishing, recreational boat ramps and marine search and rescue activities;

- Emissions from these types of activities include particulate emissions from grit blasting, heavy metals, and styrene;

- The location of these proposed activities is likely to create a significant buffer (approximately 1.5km) between these potentially emitting uses and the project site;

- Existing heavy marine industry activities undertaken in close proximity to the project site are likely to be relocated to the new proposed marine precinct, and serve to increase the buffer between these uses and the project site.

As such, it is unlikely that emissions from these activities would impact the project site in the future and in reality, is likely to result in a reduction in emissions.

The ANE assessment also modelled odour emissions from existing Port cattle export operations. The modelling predicts 99.5th percentile ground level odour concentrations for comparison with the Queensland EPA nuisance odour criteria. The results of the modelling indicate that there is potential for exceedance of the air quality criteria. Other odour-related impacts may arise as a result of the shipping of molasses during sugar seasons and diesel emissions.

They will impact Breakwater Cove residents particularly during winter due to the prevailing south easterly winds. Impacts during summer will typically be less likely.

2.2.2 Health and social impacts

Current and future impacts associated with dust and air emissions, and noise and odours from port activities are expected to be on the whole within acceptable standards as noted above, and therefore of acceptable risk to general health and well-being. The only significant health effect of noise impacts relates to sleep disturbance. To mitigate this, architectural design controls are recommended to ensure internal noise levels in future Breakwater Cove dwellings comply with relevant Australian Standards.

Residents of Breakwater Cove are typically likely to be from higher socio-economic groups, characterised by high levels of education, earning above-average incomes working as professionals, para-professionals and managers. Such groups exhibit a lower health risk profile and are associated with higher health and lifestyle indicators. They are also more likely to have private health insurance.

Local Breakwater Cove residents are likely to value the lifestyle offered by marina-based and/or water front living, and the more intense environment associated with living in proximity to the Strand and the CBD. These residents are expected to enjoy the recreational opportunities offered by the marine environment as well as The Strand precinct. This is consistent with the expectations and values of existing residents living near to the port.

Noise and odours from the port's present and future berths are the most likely source of public disamenity for Breakwater Cove residents. However, scientific analysis indicates that these are expected to be within accepted levels and where exceedance are anticipated, mitigation measures can and will be implemented.

Experiences of current nearby residents on the north-western side of Ross Creek indicate that on balance, they believe that the amenity benefits of living near to the ocean, The Strand and the CBD outweigh the disamenities (real or perceived) of proximity to the port.

Proximate location to the Port exposes the Breakwater Cove precinct to risks associated with the operation of Major Hazard Facilities at the Port. Dangerous goods and operation of such facilities, where hazardous materials may be stored or handled, are currently managed within the Port of Townsville in accordance with:

- *Hazardous Substances Regulation 1997;*
- *Dangerous Good Safety Management Act 2001; and*
- *Dangerous Goods Safety Management Regulation 2001.*

Potential hazards associated with the operation of such facilities include spillage or accidental release of hazardous substances to air, land or water and the potential for fire or explosion as a result of inappropriate storage and handling procedures. These potential hazards present risk to not only the Breakwater Cove precinct but other sites in Townsville as well.

Origin Energy is identified as an Existing Major Hazard Facility within the Port. Other storage facilities are classified ass Large Dangerous Goods Locations, and include:

- Patrick Logistics;
- Acid storage tanks near Queensland Nickel; and
- Ampol, BP, Shell and Caltex fuel storage tanks.

The operators of Major Hazard Facilities have obligations under the *Dangerous Good Safety Management Act 2001* to minimise the likelihood of accidents and impacts arising from operation of same. Safety obligations include:

- Undertaking systematic risk assessment and risk reduction measures;
- Developing emergency plans and procedures;
- Implementing a safety management system;
- Providing education, training and supervision of Major Hazard Facilities personnel; and
- Preparation of safety reports.

The Port of Townsville has approved limits for loading and unloading of Class 1 Explosive and Security Sensitive Ammonium Nitrate at Berths 1 to 4 and 7 to 11. These berths are in closer proximity to the Breakwater Cove precinct than Major Hazard Facilities and the Breakwater Cove precinct would be within the zone of influence should an explosion occur at one of these berths.

The Port of Townsville complies with the Australian Standard for the Handling and Transportation of Dangerous Cargoes in Port Areas in order to minimise risks of injury, and loss of life or property.

The risk analysis undertaken by Hyder Consulting indicates that the risk of fire or explosions at the Port is unlikely.

Should a Port emergency eventuate, the risk assessment concluded that The Port of Townsville's Emergency Response Plan (ERP) would be followed, and that the operator of the TOT would be required to prepare its own Emergency Plan in consultation with Townsville Port Authority and Townsville City Council.

In terms of fire and explosion incidents, the Queensland Fire and Rescue Service will be responsible for directing a response to any fire within the Port. The TOT operator would comply

with all instructions from Townsville Port Authority and the response agency as is the requirement of all port users. Further, the risk assessment noted that:

- Fire fighting equipment will be provided within the TOT precinct and will be maintained in accordance with relevant standards and legislation; and
- The TOT operator will be responsive for preventing and managing impacts from fire and explosion within the TOT precinct.

2.2.3 Economic impacts on Port of Townsville

The Port of Townsville anticipates significant and sustained growth in activity over the next 20 to 25 years, possibly by a factor of 3. In planning to meet the requirements of this growth, a master plan has been developed that addresses the transportation and berthing requirements and opportunities.

The Port master plan envisages the construction of additional berths as well as the expansion of existing berths. In the longer term, the master plan involves the seaward development of the port on reclaimed land to the north-east of existing operations.

Urban encroachment is a major issue impacting on the operations of ports across the world; Australian ports – including Townsville – are no exception. In Townsville the interface between the Port and surrounding residential and commercial areas is being addressed through the development of the City-Port Strategic Plan. This Strategic Plan is being developed jointly by Townsville City Council and Townsville Port Authority. It is not yet final.

This notwithstanding, the interface between the Port and nearby residential developments to the north-west of the Port has been governed through a range of documents that combined together provide for the protection and continuation of existing and future Port operations and ensure that any complaints against the Port and Port users by nearby residents are restricted.

These Port Protection Measures (PPMs) include the Port Protection Agreement, Port Protection Code, Community Management Scheme for the Development and contractual protection. The overall objectives of the PPM are:

- Acknowledge the Port operations and their importance;
- Make initial and subsequent buyers abundantly aware of the Port and its potential nuisance;
- Remove body corporate rights to complain about or sue the Port; and
- Regulate building design to mitigate any impacts.

As a result of the PPM, landowners will be required to overcome a number of protective measures prior to having the right to subsequently complain against the Port operations or Port users.

The extent to which the proposed TOT development poses a risk to current and future operations of the Port thereby generating adverse economic impacts, is a function of what can be described as the political risk of residents' complaints causing changes in operational or environmental regulations and/or legislation that would impose additional costs on the Port and/or port users.

Political risk has two dimensions, namely:

- The risk of complaints per se; and
- The risk that such complaints will result in regulatory or legislative changes.

The Economic Impact Assessment considered these two dimensions in details, evaluating the extent to which such risks were prevalent and what the likelihood that such risks would materialise in the future.

The evaluation found that:

- Nearby residents on the whole tend to accept the amenity benefits of their location (such as proximity to the Strand and the CBD) over the disamenities associated with proximity to an operational Port. Evidence of this trade-off can be found in:
- High levels of stated amenity preferences, confirmed through a survey of local residents;
- Comparatively low residential turnover rates reflected in low re-sale activity in nearby residential developments;
- High property values (actual and relative) in nearby properties, indicative of the relative desirability of the location and dwelling type; and
- Low levels of complaint activity from residents located north-west of the Port.

The assessment found that (a) provided that noise and air quality impacts from the Port do not significantly change into the future (from current levels), or which can be effectively mitigated through measures such as appropriate dwelling design and construction, and that (b) future residents of Breakwater Cove are aware of and therefore expect that certain levels of port activity and growth take place, it is reasonable to conclude that future residents will make similar trade-off decisions between the amenity and disamenity of being located in the area.

As such, it is unlikely that the proximate location of new residential dwellings at Breakwater Cove and the Port will amount to irreconcilable incompatibility.

The presence of political risk by definition introduces an element of uncertainty about future investment and business activities. However, on the basis of the evidence considered in the detailed evaluations it is reasonable to conclude that:

- There is strong community support for the Port of Townsville and its contribution to the region (that is, there is substantial good will from the community);
- There is a history of limited community complaints about the Port and port users' activities;
- Nearby residents trade-off reasonable disamenity associated with proximity to the Port with the amenity benefits of being close to the Strand/ocean and the CBD; and
- There is no history of systematic failures of the Port or port users to comply with their operational, regulatory and legislative obligations.

Under these circumstances, the risk of regulatory or legislative change that will give rise to increased compliance costs to the Port and its users as a result of community complaints from nearby residents is unlikely or remote.

This being the case, from an economic impact perspective, the conclusion is that the proposed Breakwater Cove residential precinct is:

- Unlikely to limit future expansion of the port, provided that future operations continue to comply with relevant environmental standards and policies and appropriate mitigations are utilised and the Port Protection Code is implemented;

- Unlikely to cause limitations on future port growth as a result of nuisance complaints, which would be curtailed by a range of Port Protection Measures that would be implemented as part of the project (see Mitigation below); and

- Of limited to negligible risk in terms of the potential for higher environmental compliance costs for Townsville Port Authority and port users.

The detailed Economic Impact assessment report has considered potential impacts of the project on the Port of Townsville to 2030, on the basis of information available on the Port Master Plan which extends to 2030. The Terms of Reference required consideration of impacts up to at least 2050.

The Port Master Plan anticipates that future Port to 2030 can be readily met through augmentation of existing infrastructure (berth upgrades and extensions) and new berths on the outer harbour. The outer harbour developments effectively increase the distance between future port activities at these berths and the proposed Breakwater Cove residential precinct. The impacts of this development plan have been considered.

Port growth beyond 2030 (and possibly up to 2050 and beyond) is likely to be met through development of additional Port lands to the south east of the existing Port in Ross River and to the north east. The present Master Plan has identified this additional land as available for future development should the need arise. Should this broad trajectory be the case, future development of the Port post 2030 will effectively take it further away from the Breakwater Cove precinct; as such, any amenity-related impacts of future port growth post 2030 on Breakwater Cove precinct are likely to be considerably less than the anticipated impacts up to 2030.

2.2.4 Mitigation

A range of amenity impact mitigation measures have been proposed to minimise impacts from port operations on future residents and businesses at Breakwater Cove and to provide protection to current and future port operations.

These include:

- A range of Port Protection Measures (PPM);

- The construction of a 6m acoustic berm and fence between the Ocean Terminal and the Breakwater Cove precinct;

- The adoption of architectural design criteria for future Breakwater Cove dwellings to mitigate noise and odour impacts; and

- The provision of information to local residents on future events that may have odour impacts, such as loading live cattle to minimise inconvenience.

Relevant internal and external noise criteria have been developed from statutory requirements, regulations and relevant Australian Standards. These criteria will be incorporated into the FDA Port Protection Code.

The PPM includes:

- Port Protection Agreement;

- Port Protection Code;

- Community Management Scheme for the Development; and

- Contractual protection measures.

The PPM in these documents have several layers of protection as follows:

- Disclosure to buyers of the port operations;
- Flagging the port operations and the PPM to subsequent buyers;
- Measures that limit individual and group actions against the port; and
- Controls that regulate development designed to mitigate impacts on port operations.

The overall objectives and outcomes of PPM are:

- Acknowledge the port operations and their importance;
- Make initial and subsequent buyers abundantly aware of the port and its potential nuisance;
- Remove body corporate rights to complain or sue the port; and
- Regulate the building design to mitigate any impacts.

As a result of the PPM, landowners will be required to implement a number of protective measures prior to having the right to subsequently complain against the port operations or port Users. These PPM therefore form a robust set of protections for current and future port operations.

Specific noise mitigations as they relate to Port activities include:

- Construction of the 6m acoustic berm;
- Adoption of acoustic design of glazing and the building envelope construction for exposed facades of the Breakwater Cove precinct, to comply with AS3671, where noise reduction of up to 35 dB(A); and
- Door and window orientation/positioning is away from sight lines to the Port.
- Specific air quality impact mitigation measures as they relate to the operations of the Port include:
- The implementation of a registered covenant over all individual lots within the Breakwater Cove precinct that identifies that there will be a potential for occasional odour nuisance resulting from activities at the Port;
- Ensuring that all purchasers within the Breakwater Cove precinct acknowledge and accept this covenant;
- Requiring all residential buildings to be fitted with air conditioners capable of recycling internal air, such that internal air quality can be controlled within individual premises during cattle shipping activities; and
- Requesting that the Port notifies the Body Corporate of scheduled cattle export activities so that the Body Corporate can notify residents.

2.3 Alternatives to the Project

Background

The concept of an Ocean Terminal in Townsville was included in the State's report on opportunities in the Cruise Ship Industry of 2003.

At that time the State had no plans for the construction of an Ocean Terminal in Townsville.

Early in 2002, Jupiter's Limited, owner of the Jupiter's Townsville Hotel & Casino considered the desire for an Ocean Terminal by the State and linking it to the development of a residential precinct by reclamation in the adjacent area named the Future Development Area in the Breakwater Island Casino Agreement Act (BICA).

Another group made a submission to the State in the FDA area with different commercial arrangements. The State and the Proponent entered into a Development Agreement in March 2006.

Alternative Locations

A formal proposal was lodged with the State in July 2004 and it took into account the State's objective of a low to no cost option to the State for the Ocean Terminal and the need to absorb this cost as part of the development of the residential precinct.

In light of this nexus between the Ocean Terminal, largely paid for by the Proponent and the reclaimed residential precinct, no other alternative locations were considered.

Alternative Designs

Several alternative design options were considered and from these a masterplan was decided and developed in detail and submitted to the State.

Masterplan no. 9 was submitted in July 2004 with the first Tabcorp proposal.

Masterplan no. 10 was submitted in March 2006 and was included in the Development Agreement executed between the State, Tabcorp and the Developer.

Masterplan no. 12 was submitted in October 2006 as part of the IAS.

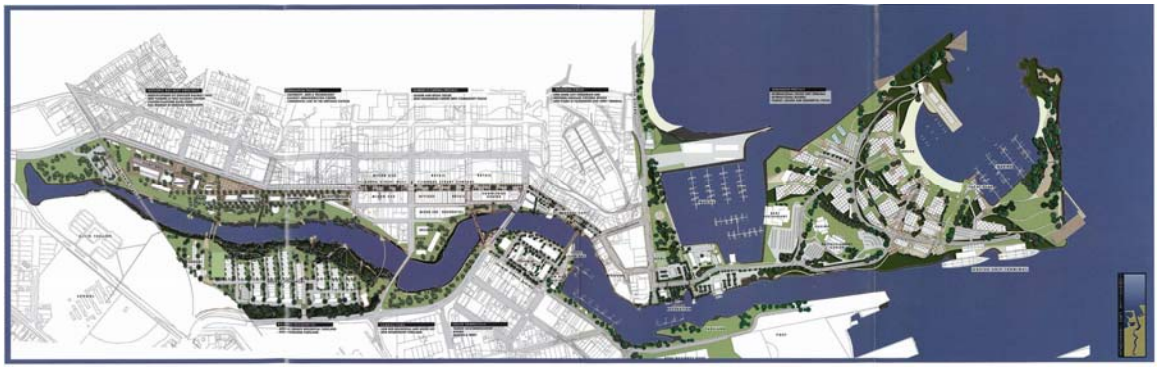
Masterplan no. 14 is the final design which has been refined as a consequence of the studies and the State TOR and forms the basis for the EIS. This masterplan has been approved in principle by the State subject to it meeting the requirements of the EIS Approvals process.

No Project Alternative

The option of not proceeding with the TOT Project was not considered as an alternative, but rather would be the consequence of not being able to find a balance between the cost of the Ocean Terminal and the net value of the residential development. This also dictated the proportion of the reclamation. As a viable balance was achieved, this alternative, being the TOT Project, is not considered relevant.

Alternative Uses of the Site

The CBD Masterplan produced by the CBD taskforce in the 1998-2001 period anticipated a cruise ship terminal on the western side of the mouth of Ross Creek. It also envisaged another recreational and commercial boat harbour (to complement the existing marina) in the general locality of the development site by adding to the existing outer breakwater, reclaiming behind the Casino and constructing a new breakwater in a north westerly direction from the end of the Casino breakwater. The CBD Masterplan picture below envisaged a great deal of development within this area including a number of large resort style developments with tourist, leisure, residential and commercial foci, as well as an extensive parkland with artificial beach functioning as an extension of the Strand. It clearly envisaged a much more intense medium to high density development outcome.



Whether the Townsville community needs or can afford such an expansive and additional open space precinct is a moot point and has been questioned by Council who will ultimately have to manage such a facility. As for the intensity of the development, notwithstanding that the State decided that the cost of developing the TOT had to be offset by some development dollars, City Pacific have proposed and the State have supported in principle, a more modest outcome.

The intensity of the development within the development site has been the subject of local debate as development proposals for the area have been tabled over the last five years. On the one hand there are those who advocate more green space for users and residents of the CBD/Northward area and therefore less development. Alternatively there are the more environmentally aware commentators who want to curtail urban sprawl and optimise development intensity in localities like this to take advantage of the range and convenience of the services and facilities in the area. The later would result in a Melbourne Docklands scale of development with dozens of high rise apartments buildings clustered around an active recreational and hospitality waterfront. Development of this scale is arguably inconsistent with the vision for the Townsville CBD and would be in direct competition to the CBD which is only now showing positive signs of recovery after a decade of decline. From an urban planning perspective something less intense but which still provided an income stream to dilute the cost of the TOT was required and there emerged a consensus between the State, Council, The Port, Breakwater Island Limited and the Developer that a less intense development was more appropriate.

The development masterplan (discussed in detail in section 3.3) includes a mix use development with limited commercial opportunities and a mix of housing types, including detached dwellings, semi-attached and attached as well as multiple level apartments and in doing so is not restricted to a narrow market or group of potential residents. This diversity in housing type is considered to be a feature of the masterplan and will allow a broad cross-section of residents to enjoy the benefits of living in the completed development. There is nevertheless still a generous allocation of open space within the planned development with walking and cycling paths for locals and visitors alike.

The planned development represents a balance approach and will result in a development which complements the planning for the CBD.

Breakwater Cove Land Use Suitability

The land use proposed for Breakwater Cove Precinct is predominantly single and medium density dwellings. In addition a small proportion of the TOT Project will include retail, food and commercial uses.

Immediately to the east is the port of Townsville which is planned to expand to the north east, in accordance with the port of Townsville expansion plan. Studies as part of this EIS have shown that the impacts from Port operations are low and when coupled with the proposed Port Protection Codes, mean that the residential use will exist comfortably in relative close proximity to the Port.

Studies and research have shown a strong demand in a number of locations world wide for residential dwellings in or close to active harbours and ports. This is consistent with the value that homeowners and investors attribute to existing dwellings close to the Townsville Port for example in No. 1 the Strand, Breakwater Villas, Mariners North and the land recently sold on the northern edge of the marina.

Alternative studies were undertaken periodically into the configuration of the TOT Project. This included consideration of the density, style and location of dwellings. As a result of those studies, the configuration of the master plan was revised (see master plan development above) to eventually determine the layout of the master plan on which the Environmental Impact Statement was based.

The final configuration increased the amount of medium density housing clustered around a large marina opposite Jupiter's Casino. The number of single residential lots has decreased overall and the residential lots have been moved further away from the port of Townsville , particularly in the north east corner of the TOT project. The result is a better located mix of product. The evolution of the configurations can be seen from the changes in the four (4) approved versions of the masterplan. The alternative of a development of medium density housing was considered and discounted.

This was due to the underlying objective to maintain the development as a low rise precinct, the need to create a balanced mix of product and concerns over security and the increased visible impact of existing and future port operations from the upper levels of medium density dwellings.

Alternative Sites and Designs

The site has unique characteristics which enable a TOT to be developed on the western edge of the Port together with a large world class waterfront residential precinct to the north of the Jupiter's Casino. No other site was found or considered which has these attributes.

Community uses have been considered and provided for with park areas, walkways linking back to the Strand and additional marina facilities.

Commercial uses were carefully considered including a larger retail precinct together with hotel and office accommodation.

Council did not wish to see the area developed with a major retail centre both from a competition perspective but also in light of the significant potential traffic impacts. The peninsula nature of the development does not lend itself to more intensive commercial and retail activity.

Dredge Material and Disposal

The construction approach for the TOT Project has evolved through several methodologies. The proposed construction method is described in section 3.4.

The construction method has focussed on minimising the amount of dredging required and more so the need to dispose of the dredge spoil at sea. A very small proportion of the material being moved will be required to be moved and dumped off site. The material that cannot be relocated on the site is the material from the actual berth pocket for the TOT precinct. This dredge spoil will most likely be used in the Townsville Port land fill areas or disposed of at sea.

Social, Economic, Ecological and Technical Criteria for Selection

The preferred and final masterplan option was selected based on the following criteria.

- Social - a world class residential precinct with a diversity of dwelling product with large open spaces available to the wider community to enjoy in close proximity to existing facilities being the Jupiter's Casino and the Strand.

- Economic - a development that will give primacy to the operation of the TOT Project and is balanced so that the TOT Project cost is almost completely paid for by the adjacent development. As a consequence, the contribution of Cruise and Military shipping as well as the new residential community will be optimised. Further, that the development will not adversely impact on the current and future operations of the Port of Townsville.

- Ecological - during development impacts damage to the existing ecology is to be minimised and once complete the ecology issues of water quality and general environmental standards are to be maintained or enhanced.

- Technical - the development must meet the stringent requirements to withstand a Q100 storm event and the TOT Project must also meet or exceed the State's standards and provide for future port expansion.

Preferred Option Selection

The selection of the preferred option did not occur as a consideration of four (or more) alternatives, the rejection of three and the selection of the preferred one. The selection was rather the result of an evolution of the design as issues arose from the evaluation of the project, its impacts, its location and the compatibility of the masterplan with the selection criteria.

A summary of this process of evaluation is set out below in bullet point form against each approved stage of the masterplan.

[Figure 1]

- Western breakwater protection was not an ideal design.

- The western residential lots looked directly east towards the port of Townsville.

- The park area was unduly linear and therefore difficult for the public to use.

- The flushing characteristics did not create ideal water quality.

[Figure 2]

- The western or Strand Breakwater is created as a stand alone structure.
- One single protected channel for access to Breakwater Cove Precinct.
- Most sites now face north or south with few facing towards the Port.
- Flushing improved.
- TOT precinct moved along the same alignment to the north.

[Figure 3]

- Strand Breakwater shifted slightly further west.
- A small medium density building site added in the north west corner.
- A small harbour added in the north east corner with super yacht capacity.
- Residential fingers increased in length and park community area increased at north east.

[Figure 4]

- The southern double residential finger has been omitted and a substantially larger inner harbour adjoining the Jupiter's Casino Site will provide the opportunity for both marina berths for the surrounding multiple dwellings and for approximately 10 super yacht berths. The economic benefit of these will be substantial, providing Townsville with its first dedicated berths for visiting super yachts.

- The residential land in the north east corner of Breakwater Cove Precinct has been moved approximately 200m further from the current and future Port activities.

- The 3 metre high berm topped by a 3m acoustic fencing between the residential precinct and the TOT precinct (and hence the Port activities) has been extended to the north and south so as to provide better protection to the residential precinct.

- The public open space area remains the same in net area, but has increased in terms of the overall percentage of public versus private space.

- There is a new area in the north east corner that allows public access to an internal canal edge via a linear park.

- The mix of residential dwellings has changed with more medium density (5 storeys) units which can be designed for maximum protection from Port activities in terms of acoustics, air quality and visual impacts and a reduced mix of small and large individual residential lots. Total residential dwelling unit numbers remain relatively static (with only a minor increase overall of 8% due to multiple dwelling density increases).

- The canal widths have been extended to improve flushing, water quality and navigability to 75m and 80m as opposed to the 55m previously.

Alternative Fill Materials

The most significant issue for the TOT Project is the fill. To create the land forms, 2.3 million cubic metres of fill is required. The availability of this quantity of fill from external sources at economically acceptable rates, is a key to the project's success, ie., its ability to meet the viability threshold.

Alternative fill sources were considered from:

- Ross River
- Ross River mouth
- The Don River
- The Herbert River and mouth
- The Burdekin River
- Cape Flattery Silica Mine

Sources 1 to 5 were areas where the sand had to be dredged and transported to the site. The source 6 is a commercial sand facility not requiring additional approvals although the shipping cost was a significant constraint.

Other material such as various grades of rock, armour rock and engineered fill were located in three (3) or more quarries in the Townsville area.

The masterplan and method of construction, sources the bulk (approximately 80%) from the seabed of the site. This significantly reduced the need to import large quantities of fill for the land forms. All of the material for the breakwaters is transported from the local quarries.

Fill Selection - Environmental Impacts and Sustainability

The construction method is not only environmentally the safest, it is also the most sustainable. Use of material from the existing site solved three key environmental concerns:

- Avoidance of the removal and potential disposal of fine clay sediments at sea. The layer of clay sediments (called ooze) remains on site largely within the canal zones.
- The reduction in imported fill took away the need for large scale dredging of one or more rivers/river mouths in the region.
- The reuse of seabed material (stiff clays) reduced the amount of fill required from external sources particularly local quarries.

Overall the major advantage of the fill source selection is certainty of supply which has a direct bearing on risk and therefore the viability of the project.

The method of construction is not unique to the development. It is in fact very similar to the method used to build the Breakwater Marina over twenty (20) years ago and to reclaim the adjacent land.

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