Port of Gladstone
Western Basin Master Plan

Under Section 10(2) of the *State Development and Public Works Organisation Act 1971*

The Coordinator-General
March 2010

Toward Q
Tomorrow's Queensland

Queensland Government

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1 Introduction

The Port of Gladstone Western Basin Master Plan has been prepared by the Department of Infrastructure and Planning on behalf of the Coordinator-General to provide the strategic planning framework against which the Coordinator-General and other approval agencies will consider future development in the Port of Gladstone Western Basin (Western Basin).

The master plan also discusses the implementation mechanisms to be enacted to achieve efficient and coordinated development of the Western Basin.

1.01 Port of Gladstone

The Port of Gladstone is one of the largest natural resource exporting facilities on the eastern seaboard and one of three major ports in Queensland. This makes the Port of Gladstone a strategic asset and a driver for the state's economic prosperity, and a major contributor to the Australian economy.

The emergence of a liquefied natural gas (LNG) industry in Gladstone, along with existing industrial/manufacturing activities further elevates the importance of the Port of Gladstone and the need for the Government to develop a long-term strategic approach for the development of the port and surrounding state development area.

1.02 Liquefied natural gas

The LNG proposals represent the most significant and immediate contributor to future development of the Western Basin. Consequently the LNG industry is discussed regularly throughout this document. However, the master plan has not been prepared solely for the benefit of the LNG industry. Rather, the master plan is aimed to meet the needs of all future development in the area.

The Government is undertaking the preparation of the master plan to provide all industry and the community with certainty that the Western Basin will be developed in an efficient manner that meets future development requirements. The master plan also assists with meeting the State's objective of fully utilising existing port infrastructure to prevent resources being prematurely committed to new 'green-field' port development, while adequate export capacity is available in the Port of Gladstone Western Basin.

1.03 Future direction

The master plan, in setting the direction of the Western Basin for the next 30 years (2009–2039), is expected to be influenced by national and/or global events, the emergence of new technology and the potential decline of existing industries, as well as changes in Government policy. As a consequence, the master plan will be reviewed approximately every five years. However, should other new industry emerge during that period, the master plan will be reviewed in light of that industries' influence on the Western Basin.

1.1 Purpose of the master plan

The purpose of the master plan is:

- to provide the Government with a broad assessment of current and potential industrial and port infrastructure development opportunities in the Western Basin
- to provide a strategic land and port development framework (2009–2039) which can be used by the Coordinator-General when making decisions related to current and future projects in the Western Basin; and to ensure the coordinated and efficient development of this area
- to assist the Gladstone Ports Corporation and the Coordinator-General to develop complementary planning strategies for the port of Gladstone and the Gladstone State Development Area
- to assess the capacity triggers necessitating new infrastructure within the Western Basin and the means to deliver those activities
- to promote the development of common-user infrastructure where there is mutual benefit and/or where a net reduction in impacts on the environment can be obtained
- to meet the requirements of the Queensland Department of Environment and Resource Management and the Commonwealth Department of Environment, Water, Heritage and the Arts for a planning framework that allows the cumulative impacts of the numerous projects proposed in the Western Basin to be coordinated.

The master plan, however does not seek to assess an individual project's social, construction, operation or environmental impacts. These assessments are addressed through the environmental impact assessment processes each project completes under either the *State Development and Public Works Organisation Act 1971*, the *Environmental Protection Act 1994* or the *Sustainable Planning Act 2009* (which replaces the *Integrated Planning Act 1997).*

Further, it is not the intent of the master plan to stipulate regulatory requirements or project specific conditions. Rather, the master plan provides acknowledgement of these requirements and identifies the appropriate assessment mechanism.

1.2 Statutory authority

The master plan has been prepared in accordance with the *State Development and Public Works Organisation Act 1971*. In particular, section 10(2) of the Act, which provides for the Coordinator-General to prepare plans that give direction *"…to secure the proper planning, preparation, execution, coordination, control and enforcement of a program of works, planned developments, and environmental coordination for the State and for areas over which the State claims jurisdiction".*

The master plan is recognised by the Commonwealth Government as a Queensland Government assessment mechanism that investigates the cumulative impacts of development in Gladstone. It is not intended to be used as part of any assessment under the bilateral agreement for individual project environmental impact statements under the *Environment Protection and Biodiversity Conservation Act 1999.*

Should the Queensland Government choose, the master plan could act as a precursor to the establishment of a strategic assessment under the *Environment Protection and Biodiversity Conservation Act 1999.*

1.2.1 Regulatory context

Development in the Western Basin is subject to a number of land use and planning schemes and Acts. The following list constitutes the core Acts applicable to development proposals in the Western Basin.

- *State Development and Public Works Organisation Act 1971*
- *Environment Protection Act 1994*
- *Integrated Planning Act 1997* replaced by the *Sustainable Planning Act 2009*
- *Transport Infrastructure Act 1994*
- *Dangerous Goods Safety Management Act 2001*
- *Petroleum and Safety (Production and Safety) Act 2004*
- *Petroleum (Submerged Lands) Act 1982*
- *Vegetation Management Act 1999*
- *Coastal Protection and Management Act 1995*
- *Fisheries Act 1994*
- *Mineral Resources Act 1989*
- *National Conservation Act 1992*
- *Marine Parks Act 2004*

It should be noted that the majority of the land in the Western Basin is part of the Gladstone State Development Area and is assessable under the *State Development and Public Works Organisation Act 1971*. While the *Integrated Planning Act 1997* and *Sustainable Planning Act 2009* are listed, they are only used by the Gladstone Regional Council to undertake land use planning decisions and its responsibilities as the planning authority where the *State Development and Public Works Organisation Act 1971* and *Transport Infrastructure Act 1994* are not in effect.

Within the Gladstone State Development Area, the Coordinator-General is the assessment manager for material change of use assessments. Outside the Gladstone State Development Area, the Gladstone Regional Council's planning scheme or Gladstone Ports Corporation's strategic port land arrangements apply.

The Western Basin is also subject to Commonwealth legislation as it lies within the Great Barrier Reef World Heritage Area as illustrated in figure 1. The development of the Western Basin has, and is expected to, affect a number of matters of national environmental significance. The principle national environmental significance matters that have been applied to projects in Gladstone are:

- Sections 12 and 15A (world heritage places)
- Sections 15B and 15C (national heritage places)
- Sections 18 and 18A (listed threatened species and communities)
- Sections 20 and 20A (listed migratory species)
- Sections 16 and 17B (Ramsar wetlands).

Figure 1—Commonwealth legislative zones

Source: GHD (2009) Port of Gladstone Western Basin Master Plan Study.

1.2.2 Legislative context

Given the variety of planning authorities, in and around the Western Basin, there is potential for inconsistency in development decisions. If this occurs, the potential benefits to be gained from the coordinated planning and development of the Western Basin may be compromised.

Consequently, the master plan, while not attempting to resolve this issue in its first iteration, recognises the need to consider the possible benefits to be acquired through Gladstone State Development Area, strategic port land and other categories of land being owned and coordinated by one entity or managed through a collaborative process. The Queensland Government will investigate the required legislative instruments in due course.

1.2.3 Administration arrangements

The master plan has been developed under the guidance of a steering committee representing:

- Queensland Department of Infrastructure and Planning
- Queensland Department of Environment and Resource Management
- Queensland Department of Transport and Main Roads
- Gladstone Regional Council
- Gladstone Ports Corporation.

Following the endorsement of the master plan by the Coordinator-General, the above parties will become signatories to a memorandum of understanding committing them to its implementation.

The Department of Infrastructure and Planning is the lead agency responsible for the master plan. All enquiries relating to the master plan should be addressed to

Port of Gladstone Western Basin Master Plan Manager
Department of Infrastructure and Planning
GPO Box 15009
Brisbane, Qld 4002.

1.3 Study area

The limits of the Western Basin study area are as follows and are illustrated in figure 2.

- The area extending from the top of Kangaroo Island down to the general vicinity of the Great Barrier Reef Coastal Management Park boundary adjacent to Friend Point and Laird Point.
- The coastal and port elements of the Targinie and Yarwun precincts of the Gladstone State Development Area, Fisherman's Landing, Wiggins Island, the Calliope River and the R.G. Tanna wharves
- South and south-east to include the port channels off Auckland Point
- East to include the Curtis Island Industry Precinct on the western side of Curtis Island from Laird Point to Boatshed Point.

There are many other factors not geographically confined to the study area that affect the master plan. These include:

- LNG pipelines entering the study area around Kangaroo Island and Fisherman's Landing
- environmental management precinct on Curtis Island
- Great Barrier Reef Coast Marine Park
- potential for additional channel duplication and outer channel works to meet port access requirements of the Gladstone State Development Area.

Each of the ancillary factors are discussed in relation to their influence of the study area.

Figure 2—Western Basin study area

Source: GHD (2009) Port of Gladstone Western Basin Master Plan Study.

2 Land use

As one of Queensland's key industrial cities, planning in Gladstone has predominantly been framed around providing opportunities for major industry and port development and ancillary supporting infrastructure.

To facilitate such development, in 1993 the Queensland Government established the Gladstone State Development Area under Section 77 of the *State Development and Public Works Organisation Act 1971*. The Gladstone State Development Area has been amended several times and now comprises approximately 28 000 hectares in five industry precincts. figure 3 illustrates each precinct within the Gladstone State Development Area.

The Queensland Government has also undertaken a series of land use and planning studies to assist in better managing the Gladstone State Development Area.

2.1 Yarwun, Targinie and Alodga precincts

Although the majority of land in these precincts falls outside the Western Basin study area, the Yarwun, Targinie and Aldoga precincts are the expected locations for large-scale industry that would place additional pressure on port capacity in the Western Basin.

To ensure that future land developments within the Gladstone State Development Area occurs in an efficient manner and match the port capacity, the Coordinator-General will use the port capacity model commissioned by Gladstone Ports Corporation to make recommendations and, where appropriate, facilitate development activities in partnership with the Gladstone Ports Corporation to ensure port planning and infrastructure activities are undertaken in a timely manner.

2.1.1 Stuart shale oil

The oil shale tenements of Queensland Energy Resources Limited underlay the Yarwun precinct. The tenements extend from the western side of Kangaroo Island down along the shore of the port and include the seabed beneath Fisherman's Landing. The mining licence is limited to a small parcel behind Fisherman's Landing. It is possible that within the life of the master plan Queensland Energy Resources Limited or another proponent could seek an application to mine and refine the shale oil.

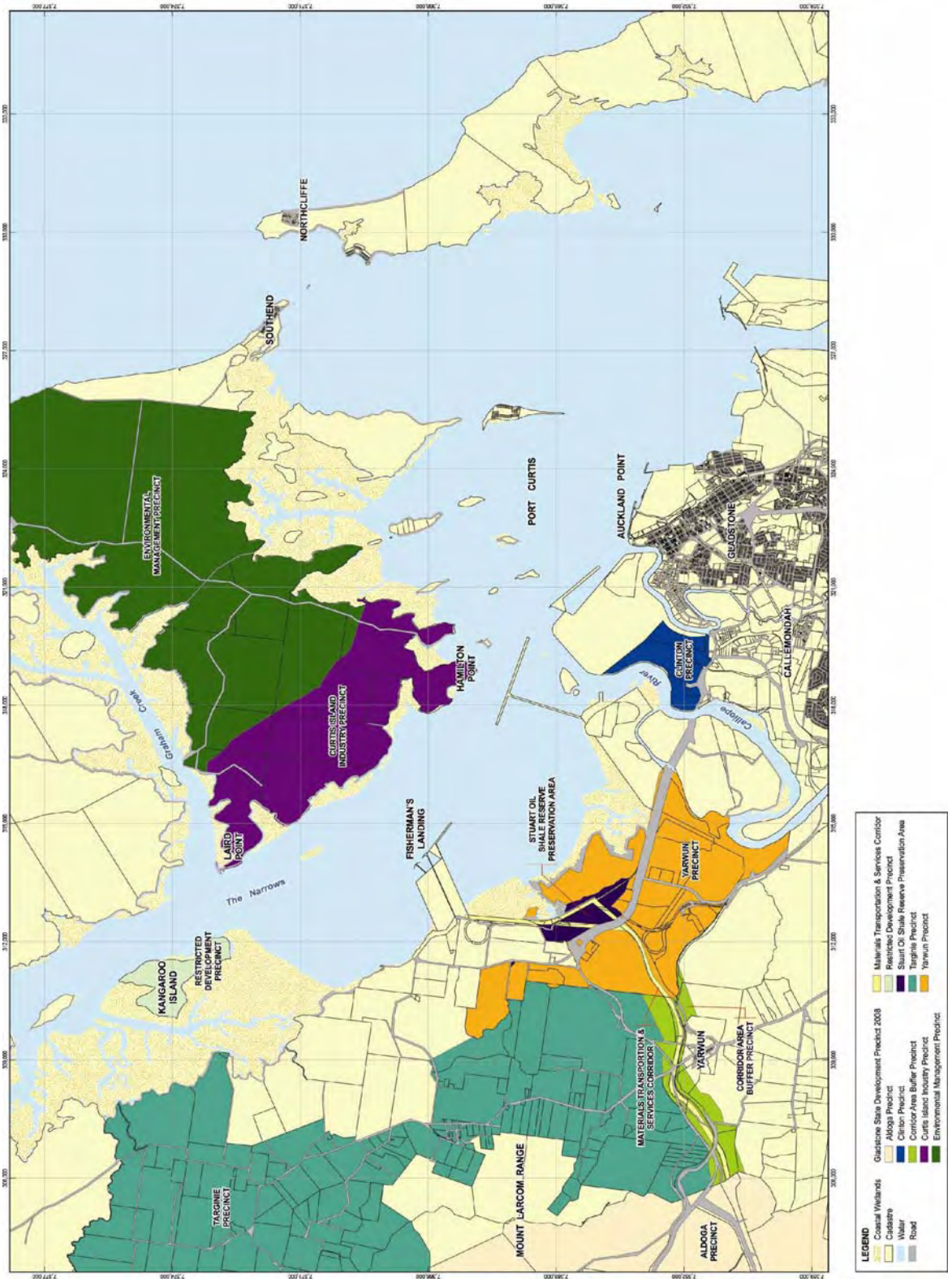
On that basis the Queensland Government believes that it is prudent to consider the location of any current or future linear infrastructure within or that traverses the oil shale resource area.

Implementation

The Coordinator-General will require material change of use applications within the Gladstone State Development Area and declared 'significant projects' to recognise the shale oil resources and to demonstrate that the location of any development avoids or minimises sterilisation of those resources.

The Coordinator-General will seek from the relevant approval agencies a similar assessment approach for all new applications received by those agencies to ensure they recognise the shale oil resources with the aim of minimising sterilisation of those resources.

Figure 3—Gladstone State Development Area precincts



Source: GHD (2009) Port of Gladstone Western Basin Master Plan Study.

2.2 Fisherman's Landing

Fisherman's Landing is designated strategic port land under the control of the Gladstone Ports Corporation, with two proposed LNG projects to be located on its northern edge.

A northern extension (153 hectares) of Fisherman's Landing has also undergoing environmental impact assessment and will provide a site for dredge spoil resulting from future port maintenance dredging and the Fisherman's Landing swing basin. The northern extension is also flagged to be used to accommodate the dredge spoil from the material offloading facilities proposed on Curtis Island by the LNG projects. When consolidated, the northern extension will enable the construction of an additional five to six berths to accommodate the future industrial requirements of the Gladstone State Development Area.

Consideration is also being given to the timing and practicality of incorporating both the Fisherman's Landing and the northern extension into the Gladstone State Development Area or managed under a collaborative arrangement.

Implementation

The Department of Infrastructure and Planning will coordinate its development assessment processes with Gladstone Ports Corporation in assessment of land and port developments on both Fisherman's Landing and the Fisherman's Landing northern extension and within the Gladstone State Development Area.

The Coordinator-General in partnership with Gladstone Ports Corporation will consider the potential for the incorporation of both the Fisherman's Landing and the Fisherman's Landing northern extension as part of the Gladstone State Development Area.

2.3 Curtis Island Industry Precinct

Development of the Curtis Island Industry Precinct presents a number of challenges, including on and offshore environmental values, significant site preparation works, and the development of infrastructure and other services.

To accommodate the construction and land use requirements of the LNG industry, in 2008 the Government established the 1563 hectare precinct, which forms part of the Gladstone State Development Area.

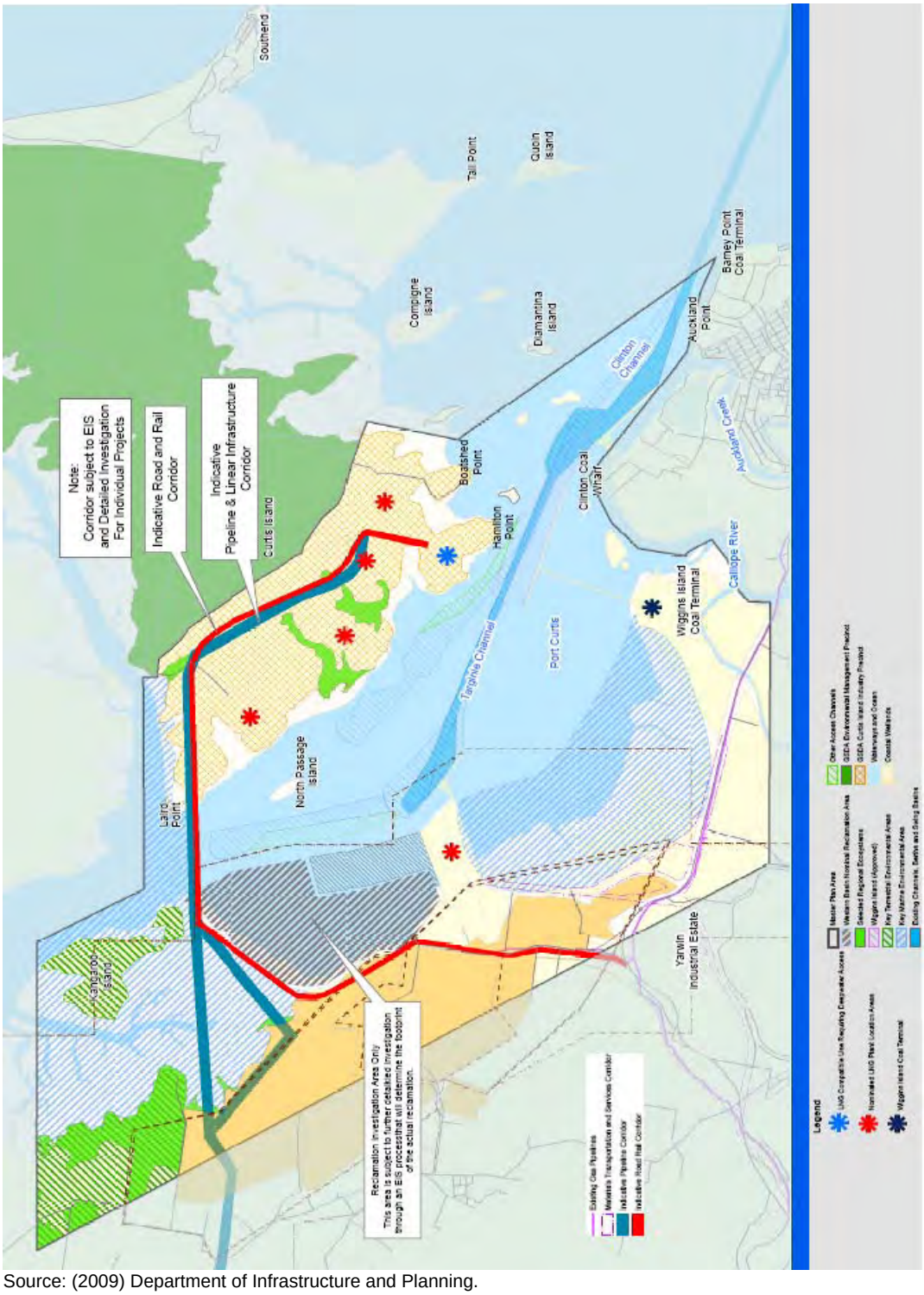
The Gladstone State Development Area Development Scheme designates the land for "*the establishment of liquefied natural gas (LNG) facilities for processing operations (including liquefaction and storage)... and the establishment of infrastructure associated with LNG facilities including transport linkages to wharf facilities".* It also refers to the establishment of port facilities, which relates to the potential development of port-related activities at Hamilton Point.

Based on a desktop analysis, the Coordinator-General has identified five acceptable areas within the Curtis Island Industry Precinct upon which an LNG project or port-related activity could be established. Each area is discussed in the following sub-sections and is illustrated in figure 4. The Gladstone State Development Area Development Scheme also provides for associated commercial opportunities resulting from site preparation (such as forestry, sand or fill material).

Implementation

The Coordinator-General will maintain the Curtis Island Industry Precinct for the development of LNG facilities and related activities in accordance with the Gladstone State Development Area development scheme.

Figure 4—Indication of LNG plant locations and associated infrastructure



Source: (2009) Department of Infrastructure and Planning.

2.3.1 Temporary Workers' Accommodation Facilities

The Queensland Government, as a result of the proposed development of LNG on Curtis Island, is currently considering the establishment of temporary workers' accommodation facilities (TWAF) and what extent or size those facilities could be, if permitted.

The Coordinator-General has requested LNG proponents provide greater clarity around TWAF proposed on Curtis Island. Following receipt of further information from LNG proponents the Coordinator-General will provide guidance on the extent to which, if any, TWAF may be considered on Curtis Island. Subsequent to this advice any proposals for TWAF will be formalised through environmental impact statement and development assessment decision making processes.

2.3.2 Laird Point

Laird Point is the largest designated site for LNG development within the Curtis Island Industry Precinct. It is heavily influenced by the marine environment due to the existence of a tidal inlet and its proximity to North Passage Island (tidal flows). Development of this area could also be impacted by the transport and pipeline corridor, on the northern/eastern boundaries of the two sites. See figure 4 and section 4.1 and 5 for further discussions on the transport and pipeline corridor.

Shipping access to this area would require significant dredging with the berth and swing basin presently located on the north-eastern or north-western side of North Passage Island and in close proximity to The Narrows.

The LNG proponent investigating Laird Point as part of its environmental impact statement is examining alternative channel/berth arrangements, as well as the establishment of a material offloading facility which will be subject to environmental impact assessment. The alternative proposal however is not recognised by this iteration of the master plan as it deviates from the agreed channel works program.

Implementation

The Coordinator-General will assess and determine the suitability of the current and any alternative channel(s) or berth(s) presented by LNG proponents and, if appropriate, will incorporate those amendments into the Coordinator-General's Report or as a Change Report for Port of Gladstone Western Basin Strategic Dredging and Disposal Project.

2.3.3 North China Bay

North China Bay is bordered to the north and south by 'endangered vegetation' communities, necessitating careful design of the plant and site development to minimise environmental loss.

Shipping access to this area requires substantial dredging, the creation of a berth swing basin and materials offload facility adjacent to Hamilton Point West. To avoid/minimise impacts, the master plan recommends the creation of a common-user channel to service both this area and Hamilton Point West.

Implementation

The Coordinator-General as part of the Hamilton Point Land Use Plan, in consultation with LNG proponents and Gladstone Ports Corporation, will determine the extent and location of a

common-user infrastructure corridor on Hamilton Point to service North China Bay, Boatshed Point and Hamilton Point West.

2.3.4 Hamilton Point West

Hamilton Point West consists of a tidal bay lined with mangroves. This site is heavily wooded, contains limited areas of 'endangered vegetation' and is bordered to the north and east by two ridge lines.

Shipping access to this area would involve significantly less material removed than that required to access any of the other proposed sites. This dredging would be the precursor to a common-user channel to North China Bay. This site may still require the creation of a berth swing basin and materials offload facility should the proposed common-user facility at Hamilton Point not be used.

Implementation

The Coordinator-General as part of the Hamilton Point Land Use Plan, in consultation with LNG proponents and Gladstone Ports Corporation, will determine the extent and location of a common-user infrastructure corridor on Hamilton Point to service North China Bay, Boatshed Point and Hamilton Point West.

2.3.5 Hamilton Point

Hamilton Point is the closest site to Gladstone within the Curtis Island Industry Precinct and comprises steep, heavily timbered terrain. The site will require significant clearing and earth works to enable development. Visual amenity will also be a significant planning consideration in this area.

Hamilton Point is owned by the Gladstone Ports Corporation which intends to retain the area for future port-related activities, such as a container port or liquid products exporting facility. The area provides natural deep water access for cape-size vessels and is backed by land suitable, with significant earth works, for associated port facilities. Any port development would be subject to the same visual amenity and environmental impact obligations as required by the LNG proposals.

The Queensland Government has determined that Hamilton Point will not be approved for stockpiling (i.e. coal or other products that could become airborne) as there is the potential for impacts upon the air filtration systems of the adjoining proposed LNG plants, as well as contributing to contaminants in Gladstone's airshed.

The Queensland Government has also determined that LNG projects do not meet its future development plans for Hamilton Point. Consequently, no LNG plant will be approved for development on this area. However, the construction of common-user facilities may be permitted, subject to satisfying visual amenity obligations.

2.3.5.1 Common-user material offloading facility

Hamilton Point is the nominated location for a possible common-user material offloading facility to service projects located at North China Bay, Hamilton Point West and Boatshed Point.

Gladstone Ports Corporation as part of the Fisherman's Landing northern extension project's environmental impact statement has investigated the inclusion of spoil from the material offloading facilities on Curtis Island within that project.

Implementation

The Coordinator-General will prepare a Hamilton Point Land Use Plan that sets out how the land and water zones around Hamilton Point should be used. The Plan will also stipulate the extent of natural terrain to be maintained to provide a visual buffer between Gladstone City and any development in the Curtis Island Industry Precinct.

The Coordinator-General as part of the Hamilton Point Land Use Plan, in consultation with LNG proponents and Gladstone Ports Corporation, will determine the extent and location of a common-user infrastructure corridor on Hamilton Point to service North China Bay, Boatshed Point and Hamilton Point West.

The Department of Infrastructure and Planning, in collaboration with LNG proponents, will investigate the potential for concentrating the number of LNG berths on Curtis Island to reduce the total area subject to exclusion zones and to ensure limited impacts on harbour access when the loading of LNG occurs.

The Coordinator-General will, if appropriate, consider amending the Gladstone State Development Area development scheme to clarify what activities are permitted on Hamilton Point.

2.3.6 Boatshed Point

Boatshed Point is located east of Hamilton Point and consists of two titles held by Gladstone Ports Corporation and Kemsip Pty Ltd. The area is heavily wooded and its tidal bays are lined with mangroves.

To provide shipping access significant dredging would be required between Tide and Witt islands. The resulting berth(s) would be subject to strong cross-current and tidal eddies created by the surrounding islands.

Boatshed Point is also close to significant seagrass communities which are core feeding grounds for dugong and turtles. Any dredging into Boatshed Point would be expected to create impacts on the area's environmental values, particularly from dredge plumes.

Implementation

The Coordinator-General will recommend to LNG proponents establishing plants in Boatshed Point to locate their berth(s) at Hamilton Point West, instead of at Boatshed Point. This will enable the LNG proponents to take advantage of the proposed development of shared facilities, reduce the total quantity of dredge material, and minimise the impacts of dredging activities.

The Coordinator-General as part of the Hamilton Point Land Use Plan, in consultation with LNG proponents and Gladstone Ports Corporation, will determine the extent and location of a common-user infrastructure corridor on Hamilton Point to service North China Bay, Boatshed Point and Hamilton Point West.

2.3.7 Kangaroo Island

Kangaroo Island is located at the northern edge of the Western Basin and adjacent to the Great Barrier Reef Coast Marine Park. Kangaroo Island is identified as being part of a key environmental area that stretches from Graham Creek, across The Narrows and westwards.

In 1970s, Kangaroo Island was recognised through the local government planning scheme as an alternative airport site for Gladstone. An airport facilities overlay code was enacted to cover the airspace around Kangaroo Island.

With the extension of the Gladstone State Development Area to include the Curtis Island Industry Precinct, Kangaroo Island became a restricted development precinct within the Gladstone State Development Area. Any application for material change of use on Kangaroo Island would be assessed under the Gladstone State Development Area Development Scheme in accordance with the *State Development and Public Works Organisation Act 1971* rather than the *Integrated Planning Act 1997* or *Sustainable Planning Act 2009*.

Effectively, the air zoning over Kangaroo Island and the assessment of land use, are now administered by the Gladstone State Development Area Development Scheme.

Despite the transfer of development assessment to the Gladstone State Development Area Development Scheme, the airport facilities overlay code remains in effect as part of the local government planning scheme and may be triggered by any development assessments within the 'coded' area.

In 2009, the Gladstone Regional Council made a submission to the Queensland Government for funding to extend the existing airport and has indicated that it is prepared to discuss relinquishing Kangaroo Island. Negotiations on this matter are at an early stage.

Implementation

The Coordinator-General will enter into negotiations with the Gladstone Regional Council on the future use of Kangaroo Island in respect to the overlay code and the removal of the airport designation.

The Department of Infrastructure and Planning will seek clarification from the Commonwealth Government on the steps required to amend or remove the airport facilities overlay code from future development assessments in the Western Basin.

2.3.8 Environmental management precinct

As part of the Curtis Island Industry Precinct declaration, the Queensland Government established the environmental management precinct, which accounts for 4400 hectares (75 per cent) of the total Curtis Island declaration.

The environmental management precinct on Curtis Island extends south from Graham Creek to, but excluding, the South End community and contains areas of ecological value and degraded agricultural land. The Queensland Government's objective with the environmental management precinct is to rehabilitate the degraded land, protect the areas of 'high ecological' value and establish low level recreational activities, such as walking trails and recreational fishing areas.

To the precinct's immediate east is a 290 hectare nature reserve and turtle hatchery on the east coast of Curtis Island, which is administered by Department of Environment and Resource Management, along with the national parks and conservation parks immediately to its north.

Waters seaward of the nature reserve are included in the Great Barrier Reef Marine Park. The state marine park also encompasses Graham Creek and The Narrows.

As part of the process to establish the Curtis Island Industry Precinct the LNG industry were required to contribute to the ongoing management of the environmental management

precinct, as part of their site acquisition process. These funds have been set aside in the Estates Construction Fund, which is administered by the Department of Infrastructure and Planning for rehabilitation and environmental management precinct management works.

2.3.9 Impact mitigation and offsets

Establishment of LNG facilities and associated infrastructure will impact on the environmental values of Curtis Island and adjacent waterways. Proponents through their individual environmental impact assessment processes will need to undertake the detailed environmental studies and plans to show that these impacts have been avoided, or mitigated and offset. While the Gladstone State Development Area has been established to facilitate industry development, environmental protection and offset provision within legislation still applies.

The sharing by proponents of common facilities and infrastructure is one way to reduce the environmental footprints of each project and cumulative impacts.

Implementation

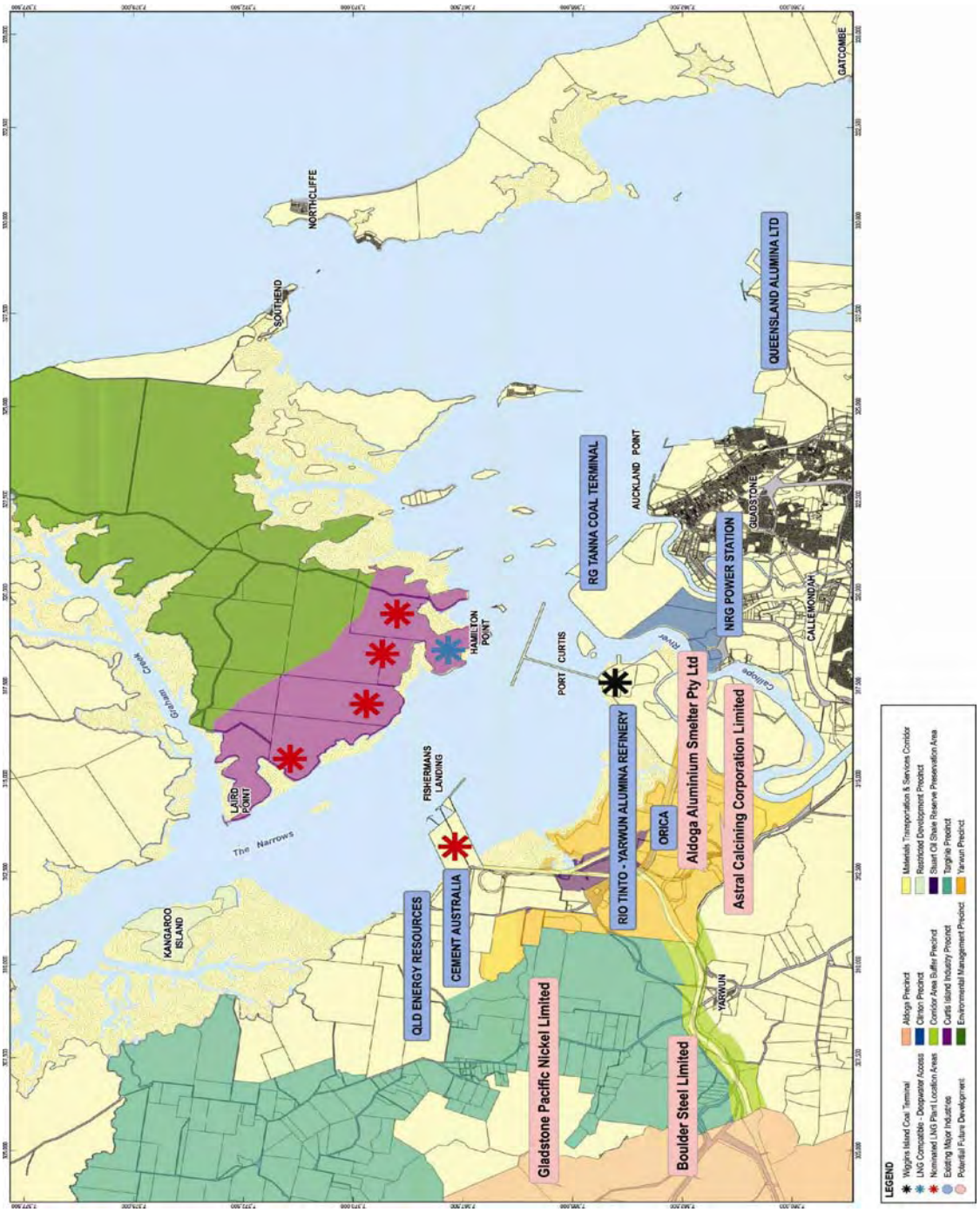
The Coordinator-General will encourage proponents to collaborate on common-user infrastructure (eg material offloading facilities, port facilities, infrastructure corridors) that minimise the total environmental impacts of multiple LNG projects. This will include undertaking investigations into the potential for shared facilities and the establishment of parameters where infrastructure sharing can occur safely and efficiently.

The Department of Infrastructure and Planning in collaboration with Department of Environment and Resource Management will ensure vegetation clearing only occurs where it is necessary for the installation of infrastructure, and only after all feasible methods (such as overpasses, underpasses, fauna infrastructure and vegetation buffer strips) have been considered to avoid and minimise the extent of clearing to maintain ecological connectivity.

3 Future industry development

The Western Basin has a diverse range of existing industries (e.g. cement, coal, alumina, chemicals) that contribute to the demand for future shipping and port capacity. There are also other existing and proposed industries in the Gladstone State Development Area and surrounding region which directly influence the demand for shipping and, in turn, the development of the Western Basin. Figure 5 illustrates a number of these proposals.

Figure 5—Existing and proposed industrial development



Source: GHD (2009) Port of Gladstone Western Basin Master Plan Study.

The two most immediate needs for future land and shipping capacity in the Western Basin are the LNG industry and the expected development of the Wiggins Island Coal Terminal. In light of this, the master plan has been developed using an assumed LNG industry size of approximately 50 million tonnes per annum (Mtpa), which is based on the size and number of announced LNG projects in the Gladstone area (table 1).

It is possible that a LNG industry of greater or lesser size could develop dependent on a range of physical, regulatory, environmental and commercial considerations by proponents.

Table 1—LNG project specifications

Proponent	No. of trains*	Production (Mtpa)	Production date
BG/QGC	3-4	12	2014
Impel LNG	2	1.5	2013
LNG Limited	2	3	2013
Origin/ConocoPhillips	4	16	2014
Santos/Petronas	3-4	10	2014
Shell	3-4	16	TBC

* a train is the term used to describe a processing plant that converts coal seam gas to LNG.

In addition to the proposed LNG projects and the announced staging of the Wiggins Island Coal Terminal, a number of other industrial developments are also planned in the Gladstone State Development Area. The specifications of these are provided in table 2.

Table 2—Industrial project specifications

Proponent	Production	Production date
Boulder Steel	2.1 (Mtpa) 5.0 (Mtpa)	2012 (delayed) TBC
Wiggins Coal Terminal	25 (Mtpa) 70 (Mtpa)	2011 (delayed) TBC
Gladstone Pacific Nickel – stage 1	60 000t nickel + 4 800t cobalt	2008 (delayed)
Gladstone Pacific Nickel – stage 2	126 000t nickel+ 10 400t cobalt	TBC

Other potential industries which at some point have approached development authorities include:

- fertiliser-production and export of urea and phosphate
- various import and export liquid operations
- shale oil.

Implementation

The Coordinator-General will collaborate with signatories of the Port of Gladstone Western Basin Master Plan Memorandum of Understanding including the Department of Employment, Economic Development and Innovation, Department of Transport and Main Roads, Department of Environment and Resource Management, Gladstone Ports Corporation and Gladstone Regional Council.

The Coordinator-General, through the 'significant project' declaration process under the *State Development and Public Works Organisation Act 1971*, will use the master plan in considering whether a project is to be declared 'significant project' subject to its impacts on the existing port capacity of the Western Basin and/or the cumulative shipping requirements

of the proposal. Should the proposal exceed the port's capacity the Coordinator-General may choose to recommend delaying the declaration of the proposal until sufficient capacity is available.

4 Common-user and support infrastructure

The Western Basin is relatively undeveloped in terms of transport and utilities infrastructure required to meet industry's needs, particularly in relation to the integration of existing and future project sites with port operations.

The Queensland Government has considered two gas pipeline routes through the Gladstone State Development Area to Curtis Island, along with transport and utilities infrastructure. These are as shown in figure 6.

Although the promotion of shared infrastructure is a key objective of the master plan it is recognised that shared facilities such as berths may not always be feasible. Issues associated with safety, the cost of cryogenic pipes and conveyors, distances between loading arms and risk management may limit some cooperative arrangements. The Queensland Government, however, remains committed to pursuing shared infrastructure and will investigate these matters with proponents as part of the environmental impact statement process for each project.

4.1 Transport infrastructure requirements

To meet the needs of future development through the Western Basin, transportation corridors have been proposed.

In 2008, the Department of Infrastructure and Planning completed work on stage 2 of the Gladstone Land, Port, Road and Rail Infrastructure Study. This study included the initial design of an infrastructure corridor linking the mainland section of the Gladstone State Development Area (GSDA) with the Curtis Island Industry Precinct. The proposed corridor was designed to accommodate a range of linear infrastructure types including road and rail connections to the Curtis Island Industry Precinct.

Although identified in the Connell Wagner Curtis Island Corridor Study[1], the establishment of an electrified rail system (i.e. haulage or sprinter) to Hamilton Point has not been assessed. The Government's decision on the future use of the area will be part of the Hamilton Point land use plan which will determine whether there is a need for a rail system.

Implementation

The Coordinator-General will identify and seek the establishment through the Governor in Council of an infrastructure corridor on Curtis Island from Laird Point to Hamilton Point to ensure that future development is sufficiently catered for and that the establishment of infrastructure does not negatively impact upon the operation of any project.

The Department of Infrastructure and Planning in collaboration with Department of Environment and Resource Management will ensure vegetation clearing only occurs where it is necessary for the installation of infrastructure, and only after all feasible methods (such as overpasses, underpasses, fauna infrastructure and vegetation buffer strips) have been considered to avoid and minimise the extent of clearing to maintain ecological connectivity.

[1]Connell Wagner (2008) Curtis Island Corridor Discussion Paper, Gladstone Land, Port, Rail and Roads Study, revision 2, 14 May 2008.

4.2 Common-user linear infrastructure corridor

On the basis the proposed LNG plants commence construction within the next two years, due to the relative timing, it is unlikely that bridge access to Curtis Island would provide any material benefit to their Stage 1 construction.

In the absence of demonstrated demand or willingness to pay by potential users, the development of road and rail infrastructure to connect the mainland section of the Gladstone State Development Area to Curtis Island will not be viewed at this stage as a priority by the Department of Infrastructure and Planning.

The capacity to accommodate future linear infrastructure such as road and rail infrastructure will be maintained to ensure all infrastructure planning options are available to the Government in the future.

4.3 Support infrastructure

The master plan does not provide specifically for major utilities, quarry materials or other industry supporting services, as they generally exist outside the master plan's subject area and have been accounted for in infrastructure corridors undertaken for the Gladstone State Development Area.

The master plan however does provide for a corridor that extends from Fisherman's Landing to Curtis Island parallel to the existing transport corridor for service infrastructure, such as water supply, gas, electricity and telecommunications.

Implementation

The Coordinator-General will identify and seek the establishment, through the Governor in Council, of an infrastructure corridor through the Gladstone State Development Area and across to Curtis Island of an appropriate width to accommodate all linear infrastructure and to allow for the optimal combination and location of services.

4.4 Funding mechanisms

Funding of infrastructure is a key underlying component in delivering the type of development proposed by the master plan. Contribution and funding arrangements will be developed to meet the specific needs of individual projects, the Gladstone State Development Area and the Gladstone community based on the level of development, both planned and under construction, at the time of each project's assessment.

The master plan does not seek to determine the final contribution mechanism or specific policy on how infrastructure is to be funded. Rather, it recognises the need for all authorities to seek or reclaim costs occurred in facilitating infrastructure for the benefits of developments in the Western Basin.

5 Gas pipelines

Planning of the pipeline corridor through the Gladstone State Development Area is a core element in establishing an LNG industry in Gladstone. The Coordinator-General is currently assessing two pipeline route corridor alignments. The first runs directly across the tidal flat to the west of Kangaroo Island and across The Narrows. The second diverges from the first route running south along the shore line to join with the transport corridor from Fisherman's Landing to Friend Point and then across The Narrows. As part of this determination, negotiations are ongoing with the shale oil leaseholder to enable appropriate access, while limiting the potential for resource sterilisation.

Figure 6 illustrates the two options currently under consideration, as well as the transport corridor across The Narrows.

The Queensland Government, following stakeholder consultation and internal review of the two option details from both an environmental and constructability perspective, has determined that the corridor as it crosses The Narrows will be 280 metres wide across, and due to curvature requirements at Laird Point will initially form part of a 340 metres infrastructure corridor on Curtis Island, which will progress decreasing width as it proceeds towards Hamilton Point.

In making the above determination the Queensland Government considered the following constraints:

- Surrounding environment, including the Great Barrier Reef Coast Marine Park to the north
- Dredging requirements and the location of future port works
- Pipe security
- Proximity to possible future bridge infrastructure.

The methods of constructing/laying the gas pipelines (e.g. tunnelling, directional drilling, trenching, etc.) within the corridor will be identified by the proponents as part of each project's environmental impact assessment.

The Queensland Government in considering the above, is prepared to accommodate a two-stage approach that will enable proponents to either pre-invest in laying a pipeline(s) during the first opening of The Narrows, or should the project's assessment still be ongoing, to lay its pipe at a later point determined by the Department of Infrastructure and Planning in consultation with the Department of Environment and Resource Management in relation to the rate of rehabilitation.

Implementation

The Coordinator-General, recognising the need to avoid/minimise impacts on environmental values, will require LNG proponents as part of their environmental impact statements to specify their preferred installation method for laying gas pipes across The Narrows and to demonstrate how installation activities will minimise environmental disturbance through appropriate construction methods, timing to avoid critical periods and shared trenching and sequencing (e.g. tunnelling following surface trenching).

5.1 Callide Infrastructure Corridor

The Queensland Government, recognising the need for co-location of underground gas pipelines from Callide to the Curtis Island Industry Precinct, proposed the establishment of the Callide Infrastructure Corridor State Development Area. This corridor was declared by the Governor in Council on 1 October 2009.

This state development area will maximise the potential for LNG proponents to co-locate their gas pipelines; in turn reducing the impacts on landowners between the Calliope Range and the Curtis Island Industry Precinct and the environment.

The route is approximately 44 kilometres long and is generally 200 metres wide. In specific areas where environmental, geographic and construction issues exist, the corridor is wider for pipe separation and construction purposes.

Figure 6—Pipeline and road/rail corridor options in the Gladstone State Development Area and across The Narrows

Source: (2009) Department of Infrastructure and Planning.

6 Channel and reclamation works

The Western Basin includes areas of shallow waters and high-value marine environment. Any new and/or deepened shipping channels and the resulting spoil disposal works pose unique challenges for avoiding, minimising and offsetting environmental impacts to the Western Basin's environmental values. Consequently, the Government will need to ensure that a balanced and coordinated approach is implemented.

The master plan provides an approach for the whole of the Western Basin. The environmental impact statement for the Port of Gladstone Western Basin Strategic Dredging and Disposal Project will address the impacts of the channels, berths and swing basins proposed in the Western Basin. This will include spoil disposal/reclamation behind Fisherman's Landing. Individual project environmental impact statements will then provide a further level of assessment relevant to the direct impacts of each project.

The master plan may require review/amendment to accommodate outcomes of the more detailed investigations and project refinement as a consequence of the findings of the environmental impact statements. The principle planning direction will however emulate from the master plan, rather than being project driven.

6.1 Channel works

To realise current and possible development in the Western Basin over the study period, further dredging works will be required as the depth of current channels are not sufficient to accommodate the anticipated draft and type of ships expected in the harbour. The channel works proposed in the Western Basin are illustrated in figure 7.

6.2 Reclamation works

It is estimated that the investigation area (grey hatching in figure 7) could accommodate approximately 60 million cubic metres of dredge spoil. However, the volume of dredge spoil generated as a result of the proposed channel works in the Western Basin is estimated to be in the order of only 36–55 million cubic metres. Accordingly, the hatched investigation is only an indication of the area within which the reclamation works would occur.

Offshore disposal was not considered feasible due to the transportation distance required, the need to assess an alternative disposal site within the Great Barrier Reef Marine Park and the resulting dredge plume that occurs with the over-flow dredging method.

Options for on and off-shore disposal in the Western Basin were also considered. These options would have required multiple sites to accommodate the amount of dredge material. Multiple sites would also increase disposal costs, potentially sterilise future industry sites and be expected to cause more environmental impacts than a single site. The steering committee, consequently determined that the investigation area behind Fisherman's Landing was the most appropriate the location for spoil disposal resulting from the Western Basin dredging works.

6.2.1 Western Basin reclamation specifications

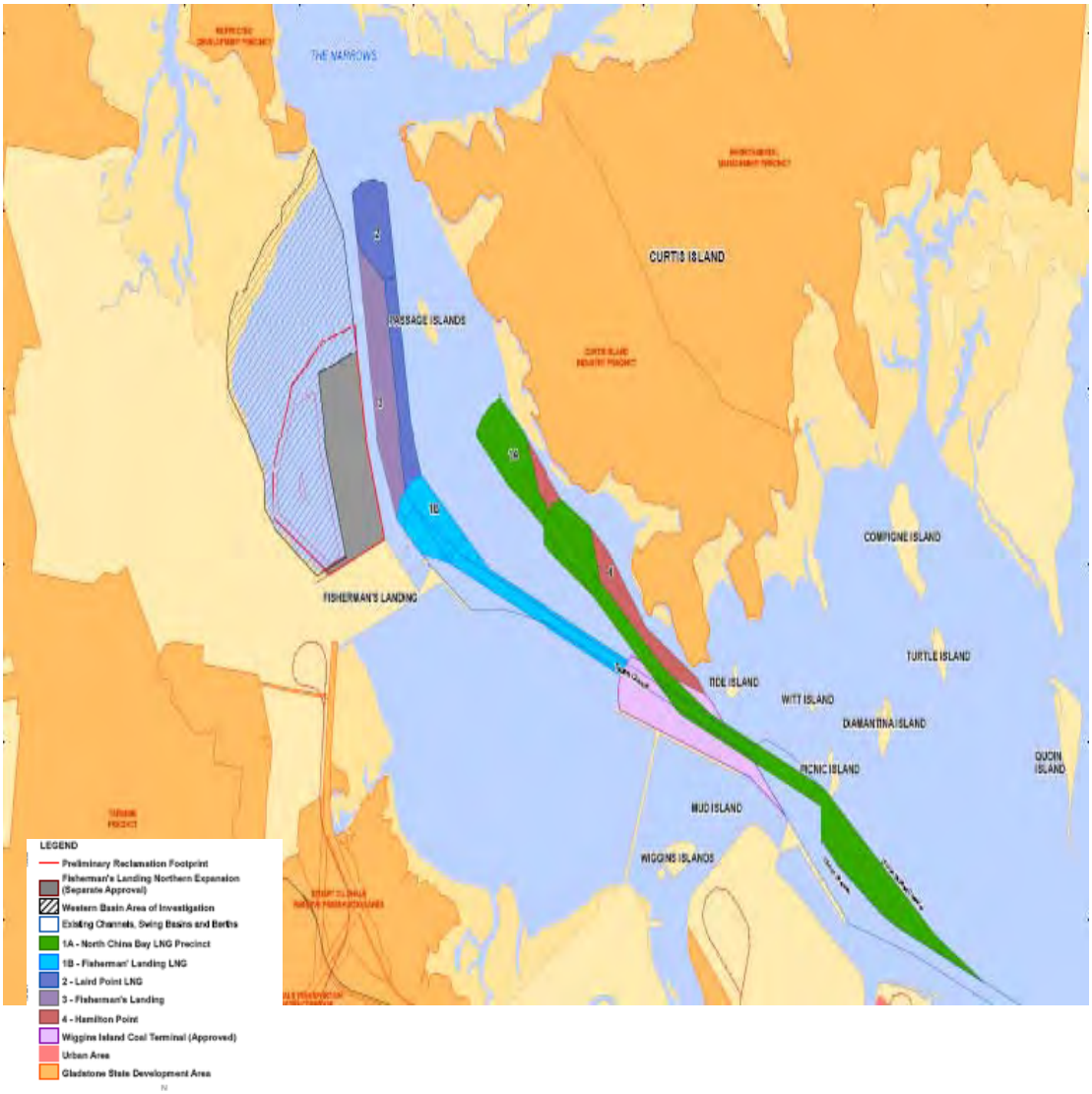
The Western Basin reclamation is intended to build upon the Fisherman's Landing northern expansion by extending north and running west towards the shoreline approximately half way

round the Fisherman's Landing extension. The reclamation will be set back approximately 40 metres from the foreshore to allow for maintenance of the benthic, algal, and mangrove communities. In addition, it will assist with conveying overland flows and stormwater.

The footprint for the reclamation provides storage for approximately 29 million cubic metres of dredge spoil, however, as the Port of Gladstone Western Basin Strategic Dredging and Disposal Project will produce approximately 55 million cubic metres of dredge spoil, it is proposed to shape the material into a 50–70 metre-high mound at the back of the reclamation.

The final configuration is to be determined following the stability tests and assessment as part of the environmental impact statement in terms of the configuration's ability to minimise impacts on tidal velocities and the re-establishment of seagrass and other benthic communities. The proposed configuration is shown as red terraces in figure. 7 and in detail on figure 8, including the proposed wetlands.

Figure 7—Indicative aerial view of reclamation works in relation to channel works



Source: Gladstone Ports Corporation (2009) Port of Gladstone Western Basin Strategic Dredging Project environmental impact statement.

Figure 8—Aerial view of Western Basin Reclamation

Source: Gladstone Ports Corporation (2009) Port of Gladstone Western Basin Strategic Dredging Project environmental impact statement.

6.2.2 Dredge spoil characteristics

The dredged material from the Western Basin is generally a complex matrix of silts, gravels, and clays which have proven to be suitable for reclamation. In some location the dredge spoil could contain acid sulfate soil which will be addressed by the proponent's environmental impact statement and managed in accordance with the State Planning Policy SP2/02 and associated guidelines.

Gladstone Ports Corporation has deemed the material unsuitable for general use in the industrial and construction sectors. The dredge spoil is expected to have a protracted settling period of one to ten years (unless surcharged) before it is suitable for any industrial purposes or construction (such as stockpiling bulk material). Consequently, the proposed berths on the northern extension are a long-term prospect, unless significant soil compounding is undertaken.

7 Port and outer channel capacity

The preliminary findings of the Gladstone Ports Corporation port capacity modelling[2] found that the Western Basin in the short to medium term showed impacts on port traffic resulting from increase at anchorage delays, as well as delays on ships leaving berths, principally due to channel occupation and tidal constraints.

The relationship between the capacity of the port and industrial demands is defined by the following:

- The mix of industry types and resource development within and around the Western Basin
- The resulting generation of cargo volumes and shipping traffic
- The operational requirements of particular cargo types and related shipping types (such as safety, security, depth, swing basins, etc.)
- The physical characteristics of the port infrastructure (such as quay line, handling areas, and channels)
- Land transport and infrastructure providing sufficient access to and from the port.

With the only existing channel providing access solely to Fisherman's Landing, all other development in the Western Basin will require new channels, berths and swing basins.

The estimated increase in both the volume and type of shipping required for current and approved projects also has a flow-on effect on the outer approach channels. The outer channels are outside of the master plan's current study area. However, these channels are of relevance to the Western Basin profile as they provide the essential shipping access into and out of the Western Basin.

Gladstone Ports Corporation's revised port capacity modelling[3] has identified a series of intermediary measures that would achieve operational improvements in the Western Basin sufficient to accommodate all of the LNG projects' first trains and the first stage of the Wiggins Island Coal Terminal, therefore not requiring in the immediate need for the outer channels to be duplicated.

However, depending on the actual sequence of the development/combinations of LNG trains and the staging of the Wiggins Island Coal Terminal, as well as other industrial developments in the Gladstone State Development Area that rely on the port capacity, this position may alter and bring about the need for channel duplication sooner than expected.

Implementation

Gladstone Ports Corporation will maintain the accuracy of the port capacity modelling and will revisit it in response to major project proposals to ensure the Department of Infrastructure and Planning is kept aware of the extent of surplus capacity in the Western Basin.

The Coordinator-General, through the 'significant project' declaration process under the *State Development and Public Works Organisation Act 1971*, will use the master plan in

[2] Gladstone Ports Corporation (2006) Port of Gladstone Shipping Operations Simulation.

[3] Gladstone Ports Corporation (2009) Port of Gladstone Shipping Operations Simulation: 2009 Future Trades Scenarios, draft Sept. 2009.

considering whether a project is to be declared ‘significant project’ subject to its impacts on the existing port capacity of the Western Basin and/or the cumulative shipping requirements of the proposal. Should the proposal exceed the port’s capacity the Coordinator-General may choose to recommend delaying the declaration of the proposal until sufficient capacity is available.

8 Environmental management

As indicated in section 2.3, the identification, protection and mitigation measures relating to environmental values on Curtis Island will be addressed in each project's environmental impact statement.

The master plan does not provide recommendations in relation to each project's obligations, rather it provides a high level strategic direction and acts as the catalyst for the establishment of an environmental management plan in the whole Western Basin.

8.01 Western Basin characteristics

Within the Western Basin, there are several marine and terrestrial areas containing significant environmental values, including:

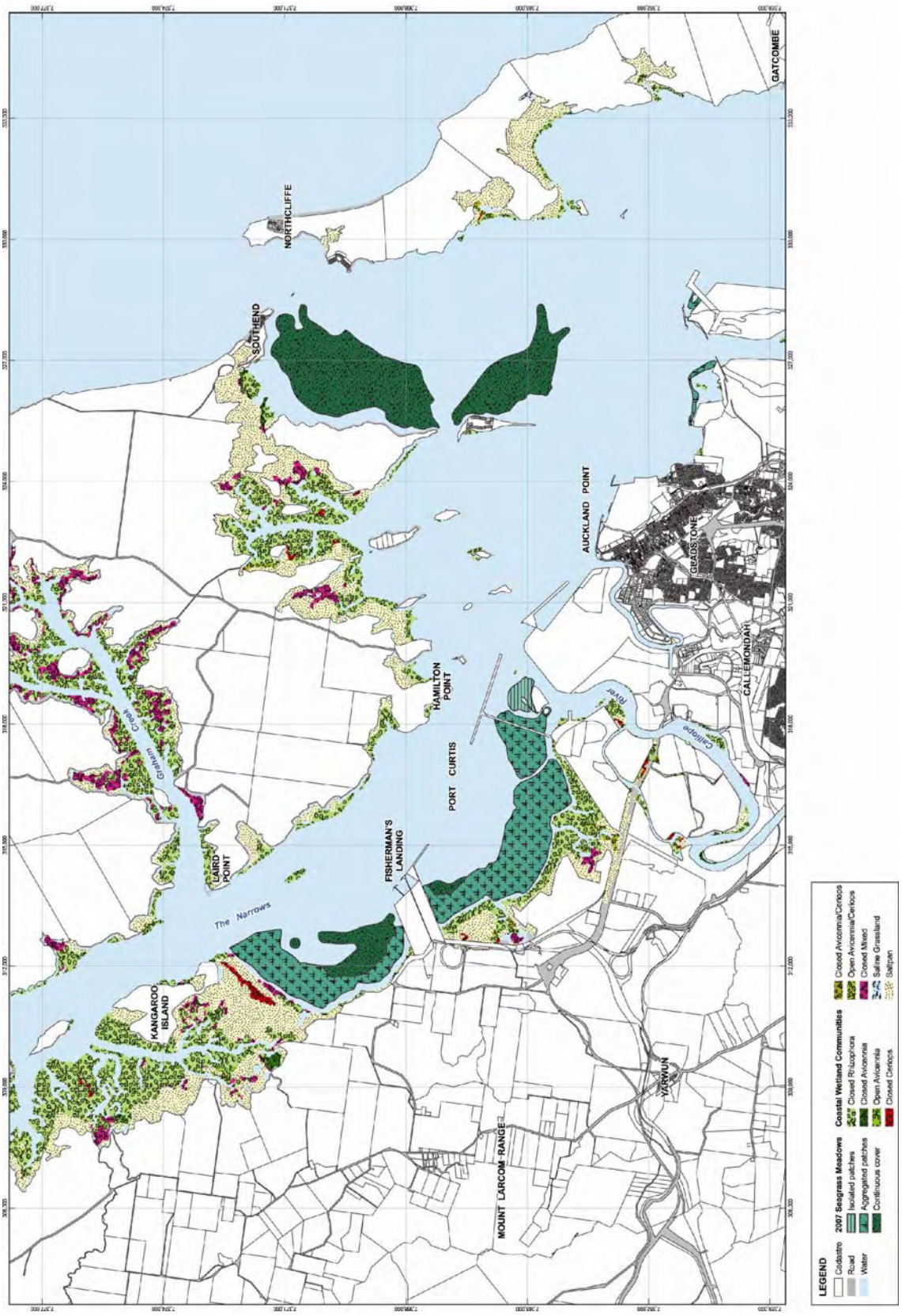
- the coastal areas between Wiggins Island and Friend Point
- between Graham Creek and Kangaroo Island and down to Friend Point
- inshore areas adjacent to Curtis Island.

All of these areas (see figure 9) contain seagrass, benthic communities, mangroves, coastal wetlands and remnant vegetation. In additional, these areas provide significant habitats for fish, prawns and molluscs, as well as feeding grounds for dugong and turtles.

Due to its proximity to the Great Barrier Reef world heritage area the northern portion of the Western Basin is largely undeveloped. Consequently, it provides limited opportunities for the creation of environmental areas. Equally, the extent of industrial development in the southern portion of the Western Basin also limits opportunities by there being too much development.

The master plan proposes that the area between Wiggins Island and Fisherman's Landing and the area north of the pipeline/common-user corridors near Kangaroo Island are maintained in their present state and that no development is permitted in this area. Outside of the above areas, the master plan will seek locations where environmental outcomes can be sought to mitigate the expected environmental impacts in the Western Basin. The potential areas under consideration are discussed in section 8.2.

Figure 9—Key environments in the Western Basin



Source: GHD (2009) Port of Gladstone Western Basin Master Plan Study.

8.1 Seagrass

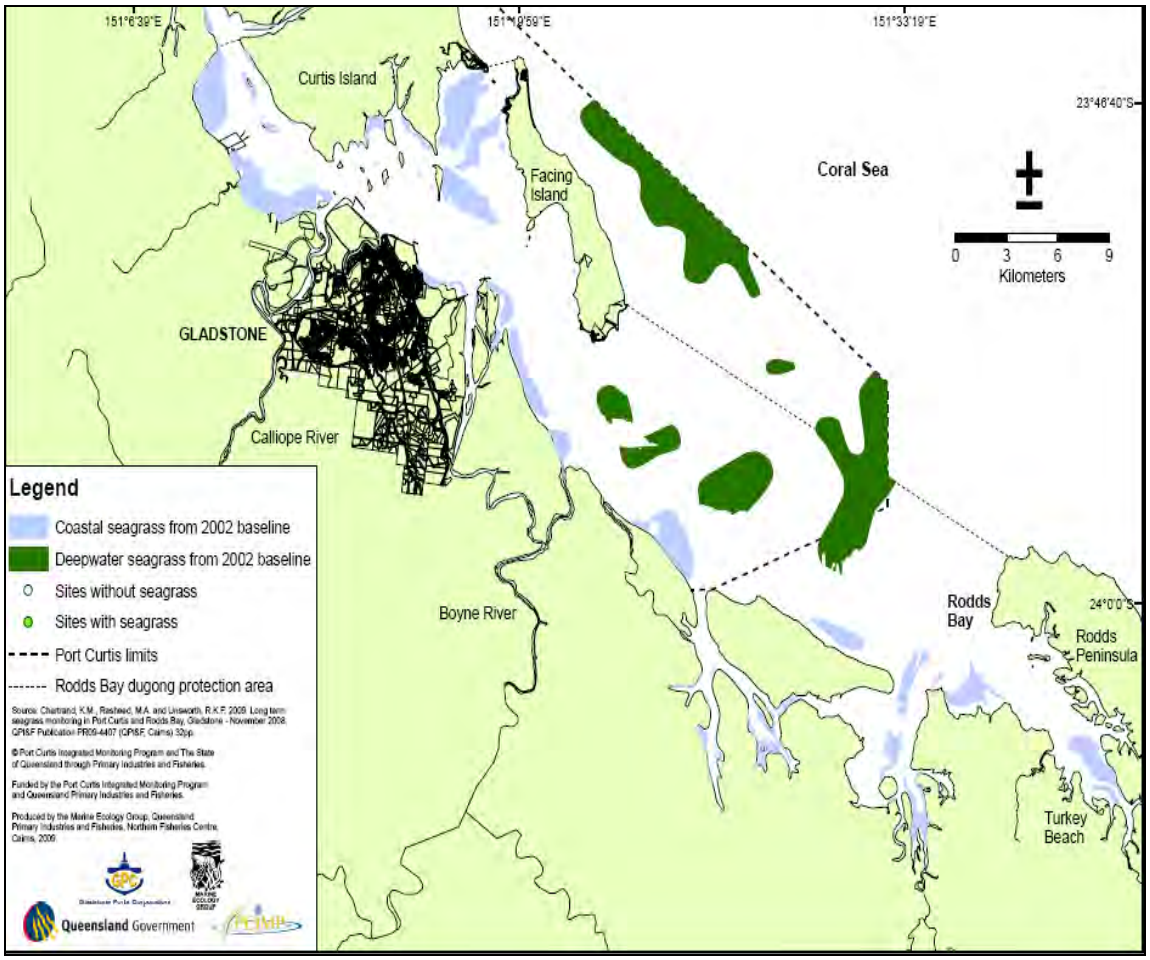
Port Curtis supports extensive areas of coastal and deepwater seagrass and represents the only substantial seagrass communities between Shoalwater Bay (170 kilometres to the north) and Hervey Bay (170 kilometres to the south) of Gladstone.

According to field analysis, a total of 7246 hectares of seagrass has been identified on the inter-tidal banks with an additional 6332 hectares of deepwater seagrass seaward of Facing Island. These seagrass meadows include species that are the preferred food of dugongs and turtles, as well as meadows that are known to be important breeding grounds for tiger prawns.

8.1.1 Seagrass monitoring

Seagrass monitoring within Port Curtis is conducted by Queensland Primary Industries and Fisheries and is funded by industry through the Port Curtis Integrated Monitoring Program[4]. A baseline survey of all the seagrass meadows in the Port Curtis and Rodds Bay region was undertaken in 2002 (illustrated in figure 10).

Figure 10—Seagrass monitoring sites and seagrass meadows: 2002 baseline survey in Ports Curtis and Rodds Bay

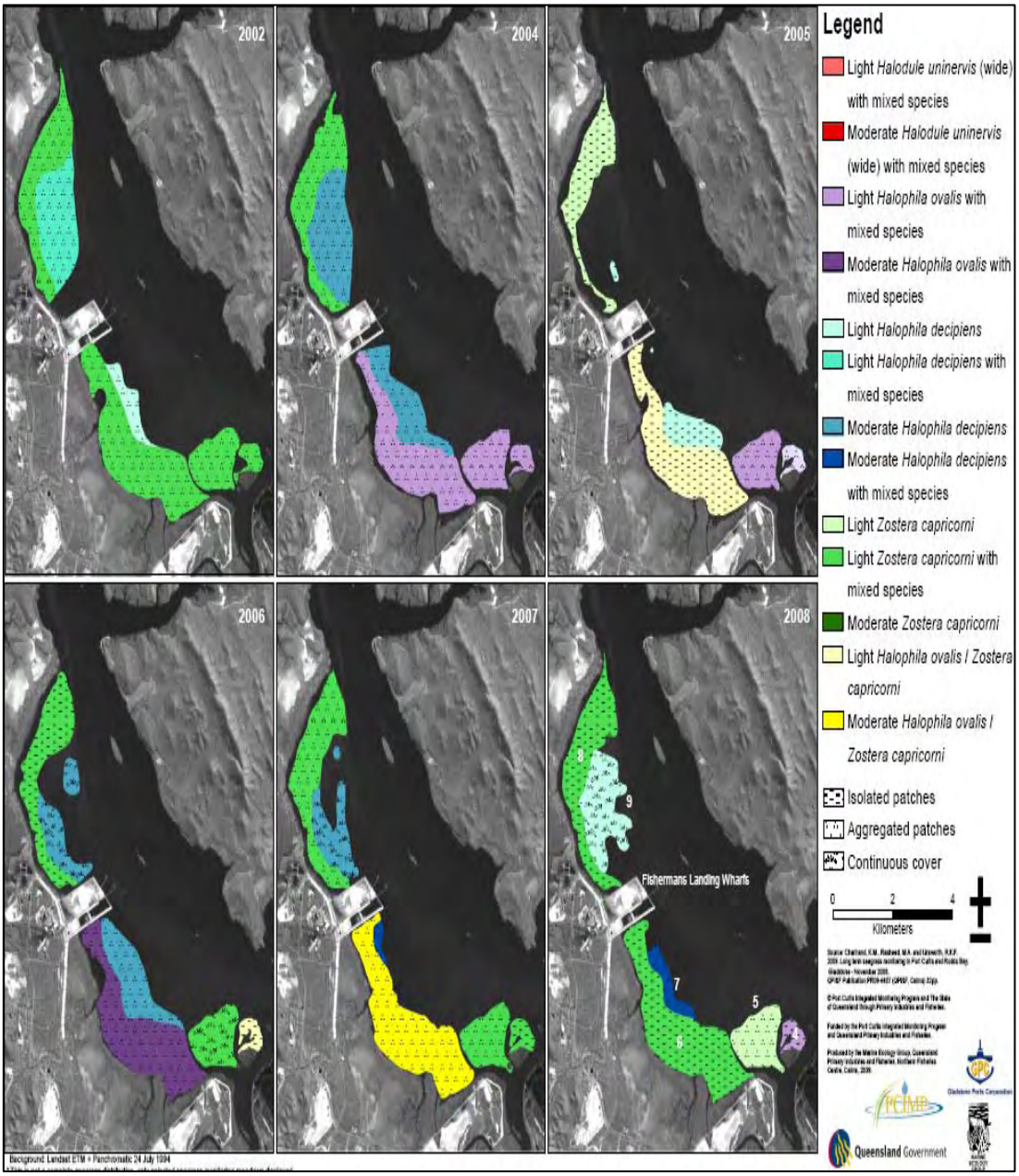


Source: Queensland Primary Industries and Fisheries (2009) Long term seagrass monitoring in Port Curtis and Rodds Bay, Gladstone -November 2008.

[4] Long term seagrass monitoring in Port Curtis and Rodds Bay, Gladstone—November 2008.

Since the 2002 baseline study, Port Curtis Integrated Monitoring Program in partnership with Queensland Primary Industries and Fisheries have undertaken annual surveys of the nominated monitoring meadows with the Western Basin with 2008 being the latest analysis. Figure 11 illustrates the outcomes of the prior six surveys for the Fisherman's Landing area and the species of seagrass present.

Figure 11—Monitoring meadows comparison, Fisherman's Landing 2002-2008



Source: Queensland Primary Industries and Fisheries (2009) Long term seagrass monitoring in Port Curtis and Rodds Bay, Gladstone -November 2008.

It is apparent from the above time series that the seagrass meadows have been relatively constant in the area south of Fisherman's Landing to Wiggins Island, hence its identification as an areas for possible environmental protection. The area between Fisherman's Landing and Friend Point (the location of the spoil disposal) has experienced a larger degree of variation in seagrass coverage over the six years of analysis. Of particular note, is the reduction of seagrass from the area proposed for the Fisherman's Landing northern extension.

Implementation

The Coordinator-General through the environmental impact statement process will encourage project proponents to assist Queensland Primary Industries and Fisheries to expand its baseline seagrass monitoring systems, with the aim to obtaining a better understanding of seagrass meadow migration and development patterns within the Western Basin. This data in turn will be used to determine the cumulative impacts of proposals and the extent of appreciable conditions to be applied in the Coordinator-General's report.

8.2 Environmental mitigation

The master plan, while providing a strategic direction for industrial and land development in the Western Basin, also ensures that the environmental aspects of the Western Basin are managed in a practical and efficient manner. The master plan has regard for the area's environmental values. The master plan also provides the catalyst for addressing the cumulative impacts of developing the Western Basin, by identifying areas within the Western Basin or along the Queensland coast that can be set aside to address expected environmental impacts and mitigation obligations of projects.

Two possible areas are Kangaroo Island, which is currently designated as an alternative airport for Gladstone, and an area east of Balaclava Island in Port Alma which is designated as strategic port land.

Kangaroo Island is located adjacent to the Great Barrier Reef Marine Park, Graham Creek and The Narrows and is a key component of the environmental characteristics of the Western Basin.

Port Alma located on the northern end of The Narrows passage is also within the Great Barrier Reef Marine Park and represents the second significant environmental community within close proximity to the Western Basin.

Parts of Port Alma are declared strategic port land, with a development proposal for Balaclava Island requiring significant dredging works.

The identification of other areas for environmental mitigation and the expected environmental benefits of Kangaroo Island and Port Alma are ongoing matters that will need to be negotiated with the Department of Environment and Resource Management and Queensland Primary Industries and Fisheries following additional investigations. Consequently, the master plan can not be prescriptive about the precise location and size of the areas chosen until future investigations are undertaken.

Each individual proposal will investigate, through its environmental impact statement process, suitable environmental areas and the level of environmental management to be applied. The specific calculation and mechanisms used to identify each project's offset requirements will then be determined as part of the project's environmental impact statement and in

consultation with the Department of Infrastructure and Planning and Department of Environment and Resource Management, in accordance with the Queensland Government's offset policy[5] and conditioned through the project's Coordinator-General report.

Implementation

The Coordinator-General will enter into negotiations with the Gladstone Regional Council on the future use of Kangaroo Island in respect to the overlay code and the removal of the airport designation.

The Coordinator-General will enter into negotiations with Gladstone Ports Corporation in relation to relinquishing strategic port land in Port Alma to enable it to be designated an environmental area.

[5] Queensland Government (2008) Environment Offset Policy.

9 Safety and security

The issues of safety and security have received increased attention in recent years as a result of potential for terrorist acts. While guarantees can not be given in relation to the possibility of addressing every potential incident, each project has an obligation as part of its environmental impact statement to formulate a security management plan in conjunction with emergency services and relevant government agencies.

The Gladstone Ports Corporation also has in place a long-standing port protocol and transit safety system which all port users must comply too.

The master plan does not seek to deviate from the current arrangements, but provides the following commentary and explanation of what systems are in place.

9.1 Industrial hazard/security

All industrial development proposed and currently operating within the Western Basin have an inherent hazard and safety risk due to the nature of its operations and its potential to conflict with adjoining developments.

The emergence of the LNG industry is a continuation of this situation. To maintain a safe environment each LNG proposal as part of its operational management plans will undertake a safety and hazard analysis, with relevant emergency and regulatory agencies.

9.1.1 LNG safety

In its liquid state LNG is relatively inert and non-explosive. As a gas its flammable limits at atmospheric pressure are quite narrow, making it safer than other petroleum based products and easier to transport.

This is demonstrated by the fact that over 470 000 cargoes have been transported globally since 1941 without reported incident. However, like any other manufacturing process there have been a small number of unfortunate fatalities at LNG plants. Each of these fatalities have resulted in notable improvements in the operational procedures and standards applied by the LNG industry.

9.1.2 LNG security procedures

Like many heavy and petrochemical industries, the LNG industry could be a potential terrorism target. As a consequence the global LNG industry, Commonwealth and Queensland Governments have implemented mechanisms to address potential security risks.

Two of these mechanisms are the International Maritime Organisation's *International Ship and Port Facility Security Code 2002* and the Commonwealth Government's *Maritime Transport and Offshore Facilities Security Act 2003*. Both deal with the safe transport of LNG.

The above code and legislation also require Gladstone Ports Corporation and vessel operators to have a maritime security plan, which outlines the measures and procedures to be undertaken to protect vessels that trade in Australian waters. Such plans typically identify the type of threat (e.g. explosives, external attack and hijacking) and the security response measures that need to be put in place. This may also include measures in the vicinity of the LNG wharves and on the vessels as they enter and leave the port.

To assess the range of potential risks and hazards to people, the environment and adjacent facilities from potential accidents, a preliminary hazard analysis is also undertaken by each proponent and included in its environmental impact statement. The preliminary hazard analysis is then assessed by Department of Infrastructure and Planning in collaboration with Major Hazard Facilities Group of the Department of Justice and Attorney-General.

The content of a number of these plans are not publicly available as such access could compromise the responses measure proposed.

Implementation

The Coordinator-General and the Department of Environment and Resource Management in collaboration with the Major Hazard Facilities Group of the Department of Justice and Attorney-General will ensure that development proposals sought either through the *State Development and Public Works Organisation Act 1971* or the *Environmental Protection Act 1994* adequately demonstrate hazard and risk analysis and mitigation measures.

9.2 Biosecurity risks

There is a need for Queensland to be protected from the risks and impacts of pests and diseases. Biosecurity is important to Queensland as pests and diseases can have a long-term impact on the profitability of our primary industries, our unique biodiversity and our way of life. In 2008 Queensland Primary Industries and Fisheries published The Queensland Biosecurity Strategy: 2009-14 [6].The strategy aims to:

- articulate a shared vision for Queensland's biosecurity system
- set out the high-level goals and strategies for biosecurity in Queensland
- identify the key strategies that will be pursued to achieve these goals
- position Queensland within the changing national and international biosecurity environment.

The master plan does not aim to deviate from the current arrangements, rather provides it commentary and explanation of what systems are in place.[6]

9.2.1 Marine biosecurity risks

There are reportably about 80 marine pest species to which the Western Basin is exposed. If any of these species became established their eradication would be problematic because of the associated environmental impacts and the scale of the marine geography involved.

As marine pests are most likely to come through ship movements, prevention will be achieved by either exchanging ballast water (water used to stabilise the ship) at sea or by chemical or physical treatment of the ballast water. These techniques are expected to limit the likelihood of a pest incursion, but do not totally eliminate the risk.

Consequently, with the increased arrival of international vessels in the Western Basin the Queensland Government and Gladstone Ports Corporation will need to consider implementing a whole of port marine pest management plan.

Implementation

The Coordinator-General will require, where relevant, as part of the environmental impact statement process that proponents develop and implement a marine pest monitoring plan

[6] The Queensland Biosecurity Strategy:2009-14

consistent with the Queensland Primary Industries and Fisheries' most recent version of the marine pests Monitoring Guidelines and Manual.

The Coordinator-General will encourage Queensland Primary Industries and Fisheries and Gladstone Ports Corporation to develop a comprehensive marine Biosecurity Management Plan for the Western Basin, which would in turn be utilised by project proponents as part of their environmental impacts statement.

9.2.2 Terrestrial flora/fauna biosecurity risks

The mitigation and management of weeds, pest animals, contaminants, diseases, and pathogens is also a high priority of the Queensland Government in ensuring the protection of Queensland's economy, environment, social amenity and human health.

Corridors are particularly vulnerable to becoming conduits for the movement of pest species.

Successful invasive species management will therefore depend on shared ownership and responsibility for action across government, stakeholders and the community for the preventative measures.

The master plan therefore proposes, in addition to existing mechanisms, the development of a Biosecurity Management Plan to provide guidance to industry in addressing the cumulative impacts of projects, as well as development in the Curtis Island Industry Precinct.

Implementation

The Coordinator-General will encourage Queensland Primary Industries and Fisheries and Gladstone Ports Corporation to develop a Biosecurity Management Plan to minimise the introduction of invasive pests in the Western Basin.

10 Community development

While the master plan principally focuses on balancing industrial, port development and environmental values within the Western Basin, the master plan also recognises that strategic planning and assessment of the impacts and the needs for social infrastructure is required from an individual project perspective, as well as cumulatively.

Beyond the large-scale/physical requirements, the master plan recognises that marine-based recreational activities occur within the Western Basin and The Narrows, which will also require planning and development assessment.

10.1 Social infrastructure development

The Queensland Government is acutely aware that while significant employment and economic benefits are derived from industry development in the Gladstone region, there is equally an increased pressure on the social infrastructure (hospitals, schools, etc.), in particular the ability of this infrastructure to meet future demands.

Project proponents and the government have commenced a number of assessments to determine the extent of cumulative impacts arising from each proposal on the community and the identification of what additional infrastructure will be required.

The outcome of this assessment is to be provided in each project's environmental impact statement. Once a working framework is in place future iterations of the master plan may stipulate specific social and cumulative impact requirements.

10.1.1 Cumulative impact assessment

The issue of cumulative assessment is an important consideration in planning the future development of the Western Basin. The master plan does not aim to stipulate the perimeters of the assessment. Rather, the environmental impact statement for each proposed project will report on the cumulative impacts of that project and its interrelationship with other projects on the community's capacity to absorb the project.

The State Development Area unit of the Department of Infrastructure and Planning, Gladstone Regional Council and the Gladstone Economic, Investment and Development Board have undertaken a social infrastructure strategic plan for the Gladstone region.

The strategic plan is to be developed with the capacity to predict impacts on Gladstone by a major industrial development in the region. In addition, the plan will also have the capacity for review and update on a regular basis to ensure that it is a credible and dynamic document.

Implementation

The Department of Infrastructure and Planning will make each iteration of the Social Infrastructure Strategic Plan for Gladstone available to relevant development approval authorities and will aim to ensure that all relevant development approvals address the recommendations of the Social Infrastructure Strategic Plan.

10.2 Recreational/ commercial port activities

As part of the literature analysis that supports the master plan, it was noted that water access for small recreational vessels may decrease in proximity to where port, industry and

infrastructure development occurs, as a result of the exclusion zones required by loading terminals.

The exclusion zones will however not impact on navigational capacity for large commercial or recreational vessels into The Narrows, thereby maintaining Graham Creek's status as a sheltered mooring area during cyclones.

In order to maintain ongoing access to the Western Basin to launch small private vessels, the master plan will incorporate, in future iterations, the outcomes of investigations into the needs for recreational boating access in the Western Basin and examine opportunities for the construction of parking and boat ramp(s) in the Western Basin.

The criteria for locating these facilitates are:

- Providing safe all-tide access
- Minimising industrial road/port vehicles mixing with recreational traffic (noting that the road routes in the Western Basin, such as Landing Road are unlikely to be developed as traffic separated roads)
- Ensuring facilities will not sterilise future development opportunities
- Minimising conflict created by small boats entering the vicinity of large vessels (i.e. coal and LNG tankers) and barges/ferries associated with industry construction
- Incorporating safe site design
- Minimising environmental impacts during construction of the boat ramp, in relation to impacts on seagrass and marine fauna

Implementation

The Department of Infrastructure and Planning, in collaboration with LNG proponents, will investigate the potential for concentrating the number of LNG berths on Curtis Island to reduce the total area subject to exclusion zones and to ensure limited impacts on harbour access when the loading of LNG occurs.

Gladstone Regional Council and Gladstone Ports Corporation in consultation with Queensland Primary Industries and Fisheries and the Department of Environment and Resource Management will examine all areas within the Western Basin suitable for recreational fishing and boating to enable the greatest degree of access possible to the western side of Curtis Island, Graham Creek and The Narrows, subject to exclusion zones.

Gladstone Regional Council will conduct public consultation(s) to determine whether an area around Fisherman's Landing or the proposed ferry terminals could be converted into an all-tide boating ramp.

11 Summary of implementation measures

The following is a summary of the implementation strategies presented in the master plan:

1. The Coordinator-General will require material change of use applications within the Gladstone State Development Area and declared 'significant projects' to recognise the shale oil resources and to demonstrate that the location of any development avoids or minimises sterilisation of those resources.
2. The Coordinator-General will seek from the relevant approval agencies a similar assessment approach for all new applications received by those agencies to ensure they recognise the shale oil resources with the aim of minimising sterilisation of those resources.
3. The Department of Infrastructure and Planning will coordinate its development assessment processes with Gladstone Ports Corporation in assessment of land and port developments on both Fisherman's Landing and the Fisherman's Landing northern extension and within the Gladstone State Development Area.
4. The Coordinator-General in partnership with Gladstone Ports Corporation will consider the potential for the incorporation of both the Fisherman's Landing and the Fisherman's Landing northern extension as part of the Gladstone State Development Area.
5. The Coordinator-General will maintain the Curtis Island Industry Precinct for the development of LNG facilities and related activities in accordance with the Gladstone State Development Area development scheme.
6. The Coordinator-General will assess and determine the suitability of the current and any alternative channel(s) or berth(s) presented by LNG proponents and, if appropriate, will incorporate those amendments into the Coordinator-General's Report or as a Change Report for Port of Gladstone Western Basin Strategic Dredging and Disposal Project.
7. The Coordinator-General as part of the Hamilton Point Land Use Plan, in consultation with LNG proponents and Gladstone Ports Corporation, will determine the extent and location of a common-user infrastructure corridor on Hamilton Point to service North China Bay, Boatshed Point and Hamilton Point West.
8. The Coordinator-General will prepare a Hamilton Point Land Use Plan that sets out how the land and water zones around Hamilton Point should be used. The Plan will also stipulate the extent of natural terrain to be maintained to provide a visual buffer between Gladstone City and any development in the Curtis Island Industry Precinct.
9. The Department of Infrastructure and Planning, in collaboration with LNG proponents, will investigate the potential for concentrating the number of LNG berths on Curtis Island to reduce the total area subject to exclusion zones and to ensure limited impacts on harbour access when the loading of LNG occurs.
10. The Coordinator-General will, if appropriate, consider amending the Gladstone State Development Area development scheme to clarify what activities are permitted on Hamilton Point.

11. The Coordinator-General will recommend to LNG proponents establishing plants in Boatshed Point to locate their berth(s) at Hamilton Point West, instead of at Boatshed Point. This will enable the LNG proponents to take advantage of the proposed development of shared facilities, reduce the total quantity of dredge material, and minimise the impacts of dredging activities.
12. The Coordinator-General will enter into negotiations with the Gladstone Regional Council on the future use of Kangaroo Island in respect to the overlay code and the removal of the airport designation.
13. The Department of Infrastructure and Planning will seek clarification from the Commonwealth Government on the steps required to amend or remove the airport facilities overlay code from future development assessments in the Western Basin.
14. The Coordinator-General will encourage proponents to collaborate on common-user infrastructure (eg material offloading facilities, port facilities, infrastructure corridors) that minimise the total environmental impacts of multiple LNG projects. This will include undertaking investigations into the potential for shared facilities and the establishment of parameters where infrastructure sharing can occur safely and efficiently.
15. The Department of Infrastructure and Planning in collaboration with Department of Environment and Resource Management will ensure vegetation clearing only occurs where it is necessary for the installation of infrastructure, and only after all feasible methods (such as overpasses, underpasses, fauna infrastructure and vegetation buffer strips) have been considered to avoid and minimise the extent of clearing to maintain ecological connectivity.
16. The Coordinator-General will collaborate with signatories of the Port of Gladstone Western Basin Master Plan Memorandum of Understanding including the Department of Employment, Economic Development and Innovation, Department of Transport and Main Roads, Department of Environment and Resource Management, Gladstone Ports Corporation and Gladstone Regional Council.
17. The Coordinator-General, through the 'significant project' declaration process under the *State Development and Public Works Organisation Act 1971*, will use the master plan in considering whether a project is to be declared 'significant project' subject to its impacts on the existing port capacity of the Western Basin and/or the cumulative shipping requirements of the proposal. Should the proposal exceed the port's capacity the Coordinator-General may choose to recommend delaying the declaration of the proposal until sufficient capacity is available.
18. The Coordinator-General will identify and seek the establishment through the Governor in Council of an infrastructure corridor on Curtis Island from Laird Point to Hamilton Point to ensure that future development is sufficiently catered for and that the establishment of infrastructure does not negatively impact upon the operation of any project.
19. The Coordinator-General will identify and seek the establishment through the Governor in Council of an infrastructure corridor through the Gladstone State Development Area and across to Curtis Island of an appropriate width to accommodate all linear infrastructure and to allow for the optimal combination and location of services.

20. The Coordinator-General, recognising the need to avoid/minimise impacts on environmental values, will require LNG proponents as part of their environmental impact statements to specify their preferred installation method for laying gas pipes across The Narrows and to demonstrate how installation activities will minimise environmental disturbance through appropriate construction methods, timing to avoid critical periods and shared trenching and sequencing (e.g. tunnelling following surface trenching).

21. Gladstone Ports Corporation will maintain the accuracy of the port capacity modelling and will revisit it in response to major project proposals to ensure the Department of Infrastructure and Planning is kept aware of the extent of surplus capacity in the Western Basin.

22. The Coordinator-General through the environmental impact statement process will encourage project proponents to assist Queensland Primary Industries and Fisheries to expand its baseline seagrass monitoring systems, with the aim to obtaining a better understanding of seagrass meadow migration and development patterns within the Western Basin. This data in turn will be used to determine the cumulative impacts of proposals and the extent of appreciable conditions to be applied in the Coordinator-General's report.

23. The Coordinator-General will enter into negotiations with Gladstone Ports Corporation in relation to relinquishing strategic port land in Port Alma to enable it to be designated an environmental area.

24. The Coordinator-General and the Department of Environment and Resource Management in collaboration with the Major Hazard Facilities Group of the Department of Justice and Attorney-General will ensure that development proposals sought either through the *State Development and Public Works Organisation Act 1971* or the *Environmental Protection Act 1994* adequately demonstrate hazard and risk analysis and mitigation measures.

25. The Coordinator-General will require, where relevant, as part of the environmental impact statement process, that proponents develop and implement a marine pest monitoring plan consistent with the Queensland Primary Industries and Fisheries' most recent version of the marine pests Monitoring Guidelines and Manual.

26. The Coordinator-General will encourage Queensland Primary Industries and Fisheries and Gladstone Ports Corporation to develop a comprehensive marine Biosecurity Management Plan for the Western Basin, which would in turn be utilised by project proponents as part of their environmental impacts statement.

27. The Coordinator-General will encourage Queensland Primary Industries and Fisheries and Gladstone Ports Corporation to develop a Biosecurity Management Plan to minimise the introduction of invasive pests in the Western Basin.

28. The Department of Infrastructure and Planning will make each iteration of the Social Infrastructure Strategic Plan for Gladstone available to relevant development approval authorities and will aim to ensure that all relevant development approvals address the recommendations of the Social Infrastructure Strategic Plan.

29. Gladstone Regional Council and Gladstone Ports Corporation in consultation with Queensland Primary Industries and Fisheries and the Department of Environment and Resource Management will examine all areas within the Western Basin suitable

for recreational fishing and boating to enable the greatest degree of access possible to the western side of Curtis Island, Graham Creek and The Narrows, subject to exclusion zones.

30. Gladstone Regional Council will conduct public consultation(s) to determine whether an area around Fisherman's Landing or the proposed ferry terminals could be converted into an all-tide boating ramp.

12 Bibliography

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