

Appendix A: Priority Port of Gladstone master planned area regulation map

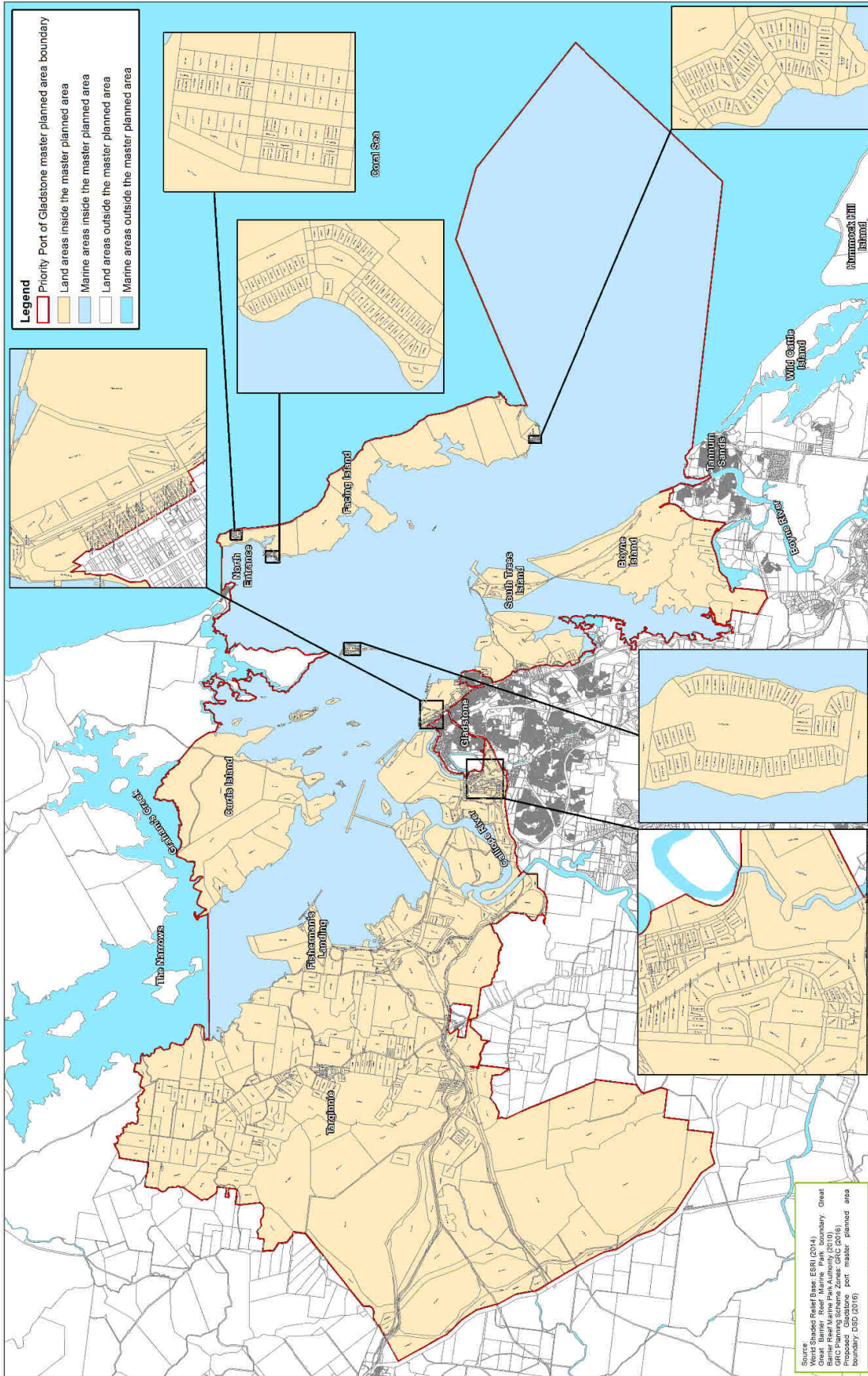


Figure A1 - Priority Port of Gladstone master planned area – regulation map

Appendix B: Master planning for the priority Port of Gladstone master planned area – capacity for growth scenarios

As part of the overall evidence base to inform master planning processes for the priority Port of Gladstone, the Department of State Development has determined capacity for growth scenarios for the priority Port of Gladstone master planned area.

A range of capacity for growth scenarios associated with economic development exists for the Gladstone region. In identifying capacity for growth scenarios a number of assumptions have been considered relating to economic drivers, industry opportunities, physical influences and the state's ports network.

The master plan for the priority Port of Gladstone is a strategic document with a long-term outlook to the year 2050. In accordance with the *Sustainable Ports Development Act 2015* the minister must complete a review of the master plan at least every 10 years after the plan has effect.

The capacity for growth scenarios, identified and examined through consultation with key stakeholders will assist the Queensland Government in determining the suitable extent and location of development areas within the priority port master planned area.

Three 'capacity for growth' scenarios have been determined for the priority Port of Gladstone master planned area:

Note: The capacity for growth scenarios focus on variations in port capacity measured in millions of tonnes per annum (mtpa) and the resulting development impacts. All figures are based on a best estimate informed by available project related documentation.

Scenario one

- There is very limited economic growth globally, as well as limited growth across the state and the Gladstone region.
- Growth is within capacity of existing facilities.
- There is a global shift away from the use of coal, and toward lower carbon intensive and renewable sources of energy to achieve improved emissions.
- There is no expansion of coal terminal capacity.
- There is minimal new industrial development.
- There is limited project-related capital dredging undertaken at the Port of Gladstone.
- Price of coal remains weak (recognising there is uncertainty about the future of coal).
- The main shipping channel is not duplicated.
- Continuation of cruise shipping.
- Maximum port throughput of 151 million tonnes per annum.

Scenario two

- There is global economic growth, as well as growth across the state and the Gladstone region.
- There is a global shift away from the use of coal, and toward lower carbon intensive and renewable sources of energy to achieve improved emissions.
- Potential for technological change to enable ongoing thermal coal due to lower emissions.
- Strong price growth for relevant commodities.
- New major industries developed within the master planned area.
- Limited duplication of the port's shipping channel and associated dredged material placement.
- Capital dredged material from the Gatcombe and Golding channel duplication, Targinie Channel and the Clinton Bypass is beneficially reused or placed onshore.
- Continuation of cruise shipping.
- Maximum port throughput of 230 million tonnes per annum.

Scenario three

- There is significant global economic growth, as well as growth across the state and the Gladstone region.
 - There is a global shift away from the use of coal, and toward lower carbon intensive and renewable sources of energy to achieve improved emissions.
 - Potential for technological change to enable ongoing thermal coal due to lower emissions.
 - Growth of coal exports supported by development of the Surat Basin linked to the Port of Gladstone by the Surat Basin Railway.
 - New major industries developed within the master planned area.
 - Significant development at Fisherman's Landing expansion and Hamilton Point.
 - Additional major infrastructure including road and rail connection from Curtis Island to mainland instead of additional dredging.
 - Strong price growth for relevant commodities.
 - Duplication of shipping channels and associated dredged material placement.
 - Capital dredged material from the Gatcombe and Golding channel duplication, Targinie Channel and the Clinton Bypass is beneficially reused or placed onshore.
 - Continuation of cruise shipping.
 - Maximum port throughput of 294 million tonnes per annum.
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Scenario one

Overall assumptions

- There is very limited economic growth globally, as well as limited growth across the state and the Gladstone region.
- Growth is within capacity of existing facilities.
- The use of low carbon and renewable sources of energy to achieve improved emissions reduces the demand for traditional energy sources such as coal.
- There is no expansion of coal terminal capacity.
- There is minimal new industrial development.
- There is limited project-related capital dredging undertaken at the Port of Gladstone.
- Price of coal remains weak (recognising there is uncertainty about the future of coal).
- The main shipping channel is not duplicated.
- Continuation of cruise shipping.

Scenario one

| Industry | Assumptions | Maximum throughput | Implications |
|--|--|--------------------|--|
| Coal | <ul style="list-style-type: none"> • Demand for coal does not increase. • Surat Basin mines are not developed. • Surat Basin rail is not developed. • There is no expansion of coal terminal capacity: <ul style="list-style-type: none"> ◦ RG Tanna coal terminal capacity remains at 75 mtpa. ◦ Future stages of Wiggins Island Coal Terminal (WICT) are not constructed, and the capacity of the terminal remains at 27 mtpa. ◦ Barney Point does not operate as a coal terminal. | 102 mtpa | <ul style="list-style-type: none"> • No additional coal facilities to be developed. • Actual throughput could be significantly less than maximum. |
| LNG | <ul style="list-style-type: none"> • Supply and demand for LNG remains stable. • There is no expansion of LNG capacity (APLNG—2 trains, 9mtpa; GLNG—2 train, 8 mtpa; QCLNG—2 trains, 8mtpa). | 25 mtpa | <ul style="list-style-type: none"> • No additional LNG trains developed. • Surplus infrastructure following LNG construction activities (e.g. laydown areas/warehousing/workforce accommodation). |
| Bauxite Alumina Aluminium | <ul style="list-style-type: none"> • Demand for alumina/aluminium decreases due to a downturn in the global economy. • One of Gladstone's two alumina refineries closes. Remaining capacity in Gladstone for alumina/aluminium is approximately 4 mtpa. • The supply of bauxite decreases to 12 mtpa in-line with the reduced refining capacity (based on approximate 3:1 ratio of bauxite imports to alumina/aluminium exports, as per 2013/14 trade figures). | 16 mtpa | <ul style="list-style-type: none"> • Opportunities for future redevelopment. • Potential road network upgrades required. |
| Other existing commodities and new industries | <ul style="list-style-type: none"> • The amount of other existing commodities (e.g. ammonium nitrate, magnesia, grain, limestone, petroleum coke) and general cargo (including containers) being imported/exported remains stable. • New industries are developed in the area to take advantage of lower entry costs e.g. waste management, gas-fired power, chemicals manufacture, meat processing. • There is some use of the port by the cruise shipping industry. | 8 mtpa | <ul style="list-style-type: none"> • Existing supply chain infrastructure is adequate. • No additional major infrastructure required at the port. • May require a purpose built terminal for cruise shipping. |
| | | 151 mtpa | |

Scenario two

Overall assumptions

- There is global economic growth, as well as growth across the state and the Gladstone region.
- There is a global shift away from the use of coal, and toward lower carbon intensive and renewable sources of energy to achieve improved emissions.
- Potential for technological advances to enable ongoing demand for thermal coal due to lower emissions.
- Strong price growth for commodities.
- New major industries developed within the master planned area.
- Limited duplication of the port's shipping channel and associated dredged material placement.
- Beneficial reuse or land disposal of dredged material will be required.
- Capital dredged material from the Gatcombe and Golding channel duplication, Targinie Channel and the Clinton Bypass is beneficially reused or placed onshore.
- Continuation of cruise shipping.

| Industry | Assumptions | Maximum throughput | Implications |
|--|---|--------------------|--|
| Coal | <ul style="list-style-type: none"> • Demand for coal increases slightly. • Surat Basin mines are not developed. • Surat Basin rail is not developed. • There is some expansion of coal terminal capacity: <ul style="list-style-type: none"> ◦ RG Tanna coal terminal continues to operate and Stage 2 of Wiggins Island Coal Terminal (WICT) is constructed. ◦ Barney Point does not operate as a coal terminal. | 135 mtpa | <ul style="list-style-type: none"> • Expansion of coal terminal capacity will take place only at WICT—additional coal terminals will not be required. • Additional berths may be required which would involve additional dredging (could be more than 1Mm³). • Barney Point Terminal may be used for other bulk commodities. |
| LNG | <ul style="list-style-type: none"> • Supply and demand for LNG increases. • The existing LNG plants are operating at maximum capacity (based on approvals: APLNG—4 trains, 18 mtpa; GLNG—3 trains, 10 mtpa; QCLNG—3 trains, 12 mtpa). | 40 mtpa | <ul style="list-style-type: none"> • Additional trains may be required at the existing plants. • Two additional berths may be required which would involve additional dredging. • Surplus infrastructure following LNG construction activities (e.g. laydown areas/ warehousing/ workforce accommodation). |
| Bauxite Alumina Aluminium | <ul style="list-style-type: none"> • Demand for alumina/aluminium increases. • The supply of bauxite increases: <ul style="list-style-type: none"> ◦ The South of the Embley project delivers 50 mtpa of bauxite (as per EIS report), of which approximately half is sent to Gladstone (25 mtpa). ◦ The Aurukun project delivers approximately 5 mtpa of bauxite (as per EIS report), all of which is sent to Gladstone. • Refining processes continue at Gladstone and refineries and smelters are built or expanded as required. • 10 mtpa of alumina/aluminium is exported through the port (based on approximate 3:1 ratio of bauxite imports to alumina/aluminium exports, as per 2013/14 trade figures). | 40 mtpa | <ul style="list-style-type: none"> • An additional refinery will need to be constructed in the master planned area, even if the existing refineries are expanded to maximum capacity. • An additional smelter may be required. • Tighter emission controls. • Additional energy supply may be required. • Additional residue storage facilities may be required. • Two additional berths may be required which would involve additional dredging. • Beneficial reuse or land disposal of dredged material will be required. |
| Other existing commodities and new industries | <ul style="list-style-type: none"> • The amount of other existing commodities (e.g. ammonium nitrate, magnesia, grain, limestone, petroleum coke) and general cargo (including containers) being imported/exported increases, but remains a relatively small proportion of overall trade. • New industries (e.g. steel plant, nickel refinery, fertilizer manufacture, fuel refinery, oil shale) are developed in the area and new commodities are traded through the port. • There is some use of the port by the cruise shipping industry. | 15 mtpa | <ul style="list-style-type: none"> • No major port infrastructure required. • Potential use of Barney Point for bulk commodities other than coal. • Further development of Fisherman's Landing expansion area. • Potential road network upgrades required. • May require a purpose built terminal for cruise shipping. |

230 mtpa

Scenario three

Overall assumptions

- There is significant global economic growth, as well as growth across the state and the Gladstone region.
- There is a global shift away from the use of coal, and toward lower carbon intensive and renewable sources of energy to achieve improved emissions.
- Potential for technological advances to enable ongoing demand for thermal coal due to lower emissions.
- Growth of coal exports supported by development of the Surat Basin linked to the Port of Gladstone by the Surat Basin Railway.
- New major industries developed within the master planned area.
- Significant development at Fisherman's Landing expansion and Hamilton Point and road and rail connection from Curtis Island to mainland instead of additional dredging.
- Strong price growth for relevant commodities.
- Duplication of shipping channels and associated dredged material placement.
- Capital dredged material from the Gatcombe and Golding channel duplication, Targinie Channel and the Clinton Bypass is beneficially reused or placed onshore.
- Continuation of cruise shipping.

Scenario three

| Industry | Assumptions | Maximum throughput | Implications |
|--|---|--------------------|---|
| Coal | <ul style="list-style-type: none"> • Supply and demand for coal increases. • Surat Basin mines are operational. • Surat Basin rail is operational. • RG Tanna coal terminal is operating at its full capacity (80 mtpa). • Wiggins Island Coal Terminal (WICT) is fully constructed and operating at full approved capacity (84 mtpa, as per EIS report). • Barney Point does not operate as a coal terminal but is used for other bulk commodities. | 164 mtpa | <ul style="list-style-type: none"> • Expansion of coal terminal capacity will take place only at WICT and RG Tanna—additional coal terminals will not be required. • Additional berths may be required which would involve additional dredging. |
| LNG | <ul style="list-style-type: none"> • Supply and demand for LNG increases. • The existing LNG plants are operating at maximum capacity (based on approvals: APLNG—4 trains, 18 mtpa; GLNG—3 trains, 10 mtpa; QCLNG—3 trains, 12 mtpa). • An additional LNG plant is constructed with a capacity of 10 mtpa. | 50 mtpa | <ul style="list-style-type: none"> • Additional trains required at the existing plants. • 2-3 additional berths may be required which would involve additional dredging. • Beneficial reuse or land disposal of dredged material will be required. • Development requires large module/equipment to be transported through the port. |
| Bauxite Alumina Aluminium | <ul style="list-style-type: none"> • Demand for alumina/aluminium increases. • The supply of bauxite increases: <ul style="list-style-type: none"> ◦ The South of the Embley project delivers 50 mtpa of bauxite, of which approximately half is sent to Gladstone (25 mtpa). ◦ The Aurukun project delivers approximately 5 mtpa of bauxite, all of which is sent to Gladstone. • Refining processes continue at Gladstone and refineries and smelters are built or expanded as required. • 10 mtpa of alumina/aluminium is exported through the port (based on approximate 3:1 ratio of bauxite imports to alumina/aluminium exports, as per 2013/14 trade figures). | 40 mtpa | <ul style="list-style-type: none"> • An additional refinery will need to be constructed in the master planned area, even if the existing refineries are expanded to maximum capacity. • An additional smelter may be required. • Additional residue storage facilities may be required. • Development requires large module/equipment to be transported through the port. • Additional energy supply may be required. • Two additional berths may be required which would involve additional dredging. • Beneficial reuse or land disposal of dredged material will be required. |

| Industry | Assumptions | Maximum throughput | Implications |
|--|---|--------------------|--|
| Other existing commodities and new industries | <ul style="list-style-type: none"> The amount of other existing commodities (e.g. ammonium nitrate, magnesia, grain, limestone, petroleum coke) and general cargo (including containers) being imported/exported increases. New industries (e.g. steel plant, nickel refinery, fertilizer manufacture, fuel refinery, oil shale) are developed in the area and new commodities are traded through the port. There is increased development of industries supporting the resources sector. New port facilities are developed at Hamilton Point on Curtis Island. There is some use of the port by the cruise shipping industry. | 40 mtpa | <ul style="list-style-type: none"> Additional berths may be required which would involve additional dredging. Beneficial reuse or land disposal of dredged material will be required. There is some use of the port by cruise shipping. Potential use of Barney Point for bulk commodities other than coal. Additional major infrastructure including road and rail connection between Hamilton Point and the mainland. Further development of Fisherman's Landing expansion area. Potential road network upgrades required. May require a purpose built terminal for cruise shipping. Construction activities may require large module/equipment to be transported through the port. |

294 mtpa