

LYTTELTON PORT RECOVERY PLAN

LYTTELTON PORT COMPANY'S INFORMATION PACKAGE

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Glossary of acronyms

Berth - The space allotted to a vessel at the wharf.

Break bulk - General cargo, as opposed to cargo in containers. Also referred to as conventional cargo. Can include cargo in packages, pallets or bulk form (dry or liquid).

Bulk - Cargo moved in bulk form, such as coal, gypsum (dry bulk) or diesel (bulk liquid).

CCC – Christchurch City Council

Coastal services - Shipping service between ports within New Zealand.

Container - Metal box structure of standard design, used to carry cargo in units. Containers can be 20 or 40 foot in length. The standard measure of a container is a TEU (20-foot Equivalent Unit). Container ships are specially designed to carry containers in slots (or cells). Containers are stacked and restrained (lashed) at all four corners by rods. Some shipping lines charter container slots on vessels operated by different companies.

Container crane - Large gantry crane specially designed to stow (load) and discharge (unload) containers from a ship.

Container terminal - Facility designed to handle containers using special purpose equipment such as container cranes, straddle carriers and container stacking areas.

Draught - The depth below the water's surface of the lowest part of a ship or boat.

Dry dock - A narrow basin that can be flooded to allow a vessel to be floated in, then drained to allow the vessel to rest on a dry platform. Vessels enter dry dock for maintenance such as repairs and repainting.

ECan - Canterbury Regional Council

LCT - Lyttelton Container Terminal.

LOA - Length Overall.

LPC - Lyttelton Port of Christchurch

Marine services - On-water services such as piloting, towing and line handling for vessels as they arrive, depart or are moved between berths.

Navigation - The process of plotting or directing the course of a vessel. This includes assembling the required charts, calculating tide and current, weather, draught, and laying out track-lines.

Patent slip - An inclined plane (which extends well into the water) and a wooden cradle onto which a boat is attached and hauled out of the water for repair.

Piloting - Activity where a pilot guides a vessel within harbour limits to ensure navigational safety.

Reefer container / Refrigerated container - Controlled temperature container suitable for chilled or frozen cargoes.

Stevedore - Individual or company employed to load and unload a vessel.

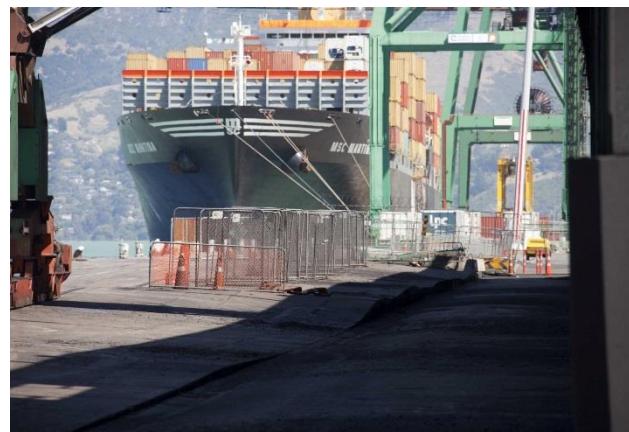
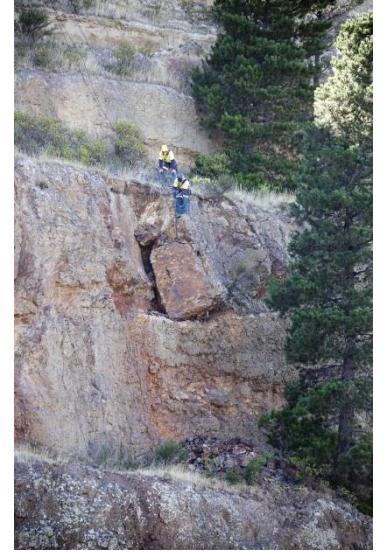
Straddle carrier - Large machine that straddles a container, lifts and moves it within a container yard. Capable of straddling a single row of containers three-high.

Towage - Where a tug tows or manoeuvres a vessel into or out of a berth.

Turnaround time - Time taken for a vessel to arrive in port, unload, reload and depart. Also refers to the time taken for a truck to arrive in port and deliver or receive cargo.

TEU - Abbreviation for the measurement of a 20-foot Equivalent Unit. This is the international standard measure of containers, i.e. a 40ft container is 2 TEU's.

Photographs showing some of the damage to Port infrastructure



1 Introduction

As the third largest port in New Zealand, Lyttelton Port forms an integral part of New Zealand's import and export transport network. This provides a critical service to Canterbury and wider South Island economies, providing importers and exporters an essential link to their markets. As a small island nation, distant from its market, an efficient freight system is particularly important to the economy. In fact of all the advanced economies, New Zealand is the most remote country in the world in terms of distance to economic activity¹. The productivity of the economy, the value of trade and the overall well-being of the community is directly affected by the costs of international freight².

The efficiency and availability of the freight system is incredibly important for New Zealand's economy, particularly ports as over 99% of all international freight to and from New Zealand is by sea. A 2009 OECD report³ stated *"Because of the importance of maritime exports and imports to the New Zealand economy, anything that hampers maritime trade is likely to be a significant constraint on economic performance"*.

The catastrophic earthquakes of 2010 and 2011 caused extensive damage to Christchurch and Lyttelton Port. Almost every part of the Port's infrastructure was impacted in some way, with over \$500 million of damage caused. Although some repairs have commenced, there is decreased resilience of remaining Port infrastructure and the damage has impacted on the efficiency of the Port's operation. The scale of work required to rebuild the Port is significant and will take 12-15 years to complete. Not only are there significant technical and logistical challenges in the construction, but the port must also remain operational and efficient throughout the rebuilding period. A Port construction project of this size and the obtaining of resource consents to authorise works in the coastal environment has never occurred in New Zealand, let alone in the midst of an operating port or within such a compressed timeframe.

As the rebuild and repair will essentially require a complete rebuild of the port, it has been decided to reconfigure the port through the reconstruction by reclaiming land to the east. This will allow the port to provide for future freight growth and changes in the nature of the shipping industry. The reconfiguration will also allow for increased public access to parts of the Inner Harbour.

On top of the construction and operational challenges of rebuilding a port are the regulatory processes that need to be followed. For Lyttelton Port, the reconstruction and operational activities are largely controlled by the Canterbury Regional Council and Christchurch City Council plans. None of these plans contemplated a significant earthquake in Canterbury or the need for a complete rebuild and recovery of a port. Consequently the rules, policies and objectives within those plans contemplated an existing Port and incremental changes over time. They do not recognise the post disaster recovery needs of the port or the community. As a result, the plans create regulatory barriers, which provide uncertainty, significant time delays and costs which will hamper the Port's recovery. These put the successful and timely recovery of Lyttelton Port and the wider Christchurch economies at risk.

In response to the risks posed by the current regulations, the Honourable Gerry Brownlee, Minister of Earthquake Recovery directed Environment Canterbury and Lyttelton Port Company

¹ International trade performance: the gravity of Australia's remoteness. Australian Treasury working paper, 2005-03. Bryn Battersby and Robert Ewing.

² International freight transport services inquiry. New Zealand Productivity Commission, 2012.

³ Structural Policies to Overcome Geographic Barriers and Create Prosperity in New Zealand", OECD Economics Department Working Papers, No. 696, Guillemette, Y. (2009), OECD Publishing.

Ltd (LPC) to prepare a Lyttelton Port Recovery Plan (gazetted 19 June 2014) (the *Direction*). The aim of the recovery plan is to provide a regulatory environment which is more appropriate for the post-earthquake recovery needs of rebuilding, repairing and enhancing a port whilst also providing for the social, economic and environmental well-being of the community.

LPC has responsibilities under the Direction including a requirement to consult with the community, including Iwi, on its long term vision for the rebuild, repair and reconfiguration of the port, undertake an assessment of effects associated with the proposed works and the necessary amendments to the planning documents. All of this information is then to be provided to the Canterbury Regional Council (ECan) to enable them to prepare a draft recovery plan for the Minister of Earthquake Recovery for his consideration. ECan will hold a further round of public consultation in their phase. The Minister will also call for written submissions on the Draft Recovery Plan.

This report and the associated appendices seeks to provide all the necessary information that LPC is required to provide under the direction. It includes a description of the existing environment, the recovery needs of the port (including a description of the recovery projects), summarises the assessment of effects, consultation, first phase impact assessment and cultural impacts assessments. It also provides the necessary amendments to the regulations and an assessment of these amendments against the CER Act. The concluding Section sets out how the information provided meets the requirements set out in the direction.

1.1.1 Physical setting of Lyttelton Harbour

Whakaraupō Lyttelton Harbour is a 15 km long, rock-walled inlet with an average width of approximately 2 km. As shown below in Figure 1.1, the upper harbour widens to form the three bays, Governors Bay, Head of the Bay and Charteris Bay, separated by peninsulas and Quail Island. The harbour has a low-tide area of approximately 43 km² and a central, long axis oriented in an ENE-direction.

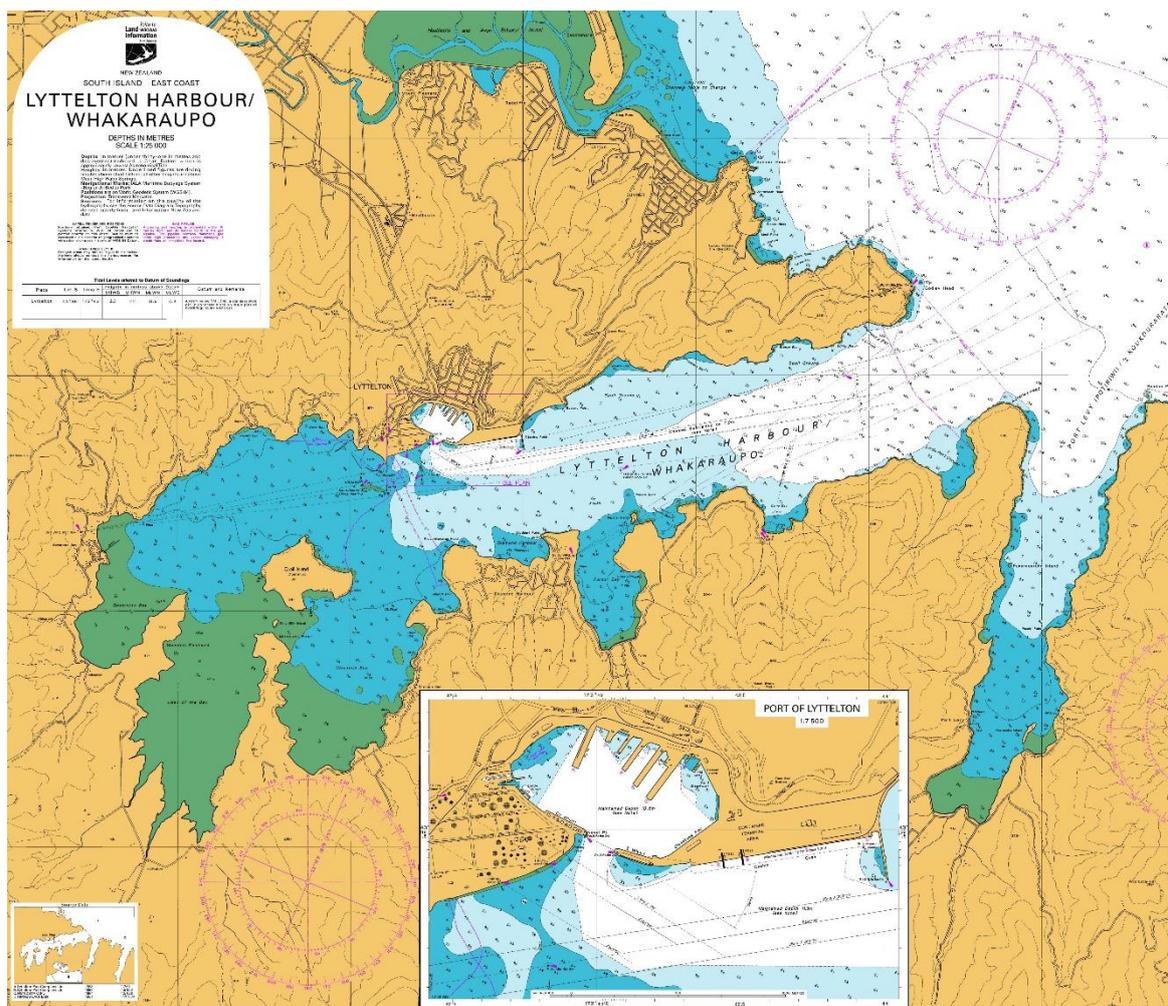


Figure 1.1: Whakaraupō Lyttelton Harbour. Source: satellite mosaic from Google Earth, 15 Feb 2011

The wider area of Banks Peninsula comprises two large Miocene (11 to 8 million years old) volcanoes, the central areas of which have collapsed and been eroded. Subsequent drowning by

the sea has formed the Lyttelton and Akaroa Harbours. The underlying volcanic rocks of the peninsula are commonly mantled by deposits of loess, up to 20m thick and blown from the Canterbury Plains during the glacial period from approximately 2.6 million until 11.7 thousand years ago, and also loess colluvium (volcanic detritus). This fine sediment is readily eroded from the hill slopes and transported to the sea.

It has been estimated that up to 47m of sediment has in-filled the harbour over many thousands of years. As a result of this accretion and the high rates of re-suspension, the seabed of the harbour is unusually flat in profile with rocks exposed at only two locations: Parsons Rock, north of Ripapa Island, and Shag Reef, north-east of Quail Island.



A wide variety of fish species have been anecdotally reported (23 species) within the harbour. In terms of mammals, Hector's dolphin/upokohue (*Cephalorhynchus hectori*) is regularly sighted in the harbour (particularly in the outer harbour), peaking in the summer months, and the NZ fur seal is found at the heads.

1.1.2 Tangata whenua settlement

There is a long and rich history of Maori settlement in Banks Peninsula. One of the earliest groups of indigenous inhabitants of the area was the Waitaha people, who arrived from Poverty Bay in the North Island during the mid-fourteenth century. They named Lyttelton Harbour "Whakaraupō" which is translated as the "harbour of raupo." They were succeeded by Ngati Mamoe,⁴ which were in turn succeeded by Ngāi Tahu at the beginning of the 18th century with settlement initially focusing on Rapaki.^{5 6} The struggles, alliances and marriages arising out of these successive migrations have formed the whakapapa (genealogy) of Ngāi Tahu Whānui.

The coastal marine area around Banks Peninsula and down to, and just past, the mouth of the Rakaia River is called Te Tai o Mahaanui. The Crown has acknowledged Te Rūnanga o Ngāi Tahu's statement of Ngāi Tahu's cultural, spiritual, historic, and traditional association to Te Tai o Mahaanui and an excerpt of the Statutory acknowledgement for Te Tai o Mahaanui articulates the values held.⁷

Te Hapū o Ngāti Wheke holds mana whenua and mana moana (traditional authority) over Whakaraupō and its catchment. Lyttelton Port is also located within takiwā (traditional territory) of Te Hapū o Ngāti Wheke (Rāpaki). The value of Whakaraupō as a provider of mahinga kai is emphasized in the below excerpt:⁸

"Whakaraupō has a rich history of Ngāi Tahu land use and occupancy, and strong tradition of mahinga kai. The harbour was named after the raupō reeds that were once plentiful at Ōhinetahi at the head of the harbour. Kaimoana such as pipi, tuaki, kutai, pāua, tio, kina and pūpū, and ika such as pātiki, pātiki rori, pīoki, hoka, aua, pāpaki, koiro and hokarari provided an abundant and reliable supply of mahinga kai for tāngata whenua and their manuhiri. The restoration of kaimoana values to the Whakaraupō is a key kaupapa for the kaitiaki Rūnanga in this catchment."

Te Hapū o Ngāti Wheke (Rāpaki) have traditionally fished for a range of species including pātiki (flounder), hoka, (red cod), aua (herring), hokarari (ling) koiro (conga eel) and the delicacy pīoke (sand shark). However fishing stocks today are reportedly insufficient to provide a regular food source for those living at Rāpaki.⁹

Tuatua (shellfish) such as pipi, tuaki (cockle), kutai (green lipped mussel), pāua, tio (oyster), kina (sea urchin) and pūpū (cat's eye) are found around Banks Peninsula but their populations, and the size of individuals, are variable. A key issue for Te Hapū o Ngāti Wheke and Koukourārata is to enable shellfish populations to recover so that there is a plentiful source of kaimoana. There is a

⁴ Ngati Mamoe named the area now occupied by Lyttelton port and township as Ohinehou. Ohinehou was an ancient Ngati Mamoe pa or village which was probably situated on the western side of Lyttelton situated near to the present day rail tunnel mouth although it no longer existed when European arrived.

⁵ Although by the mid-1800s it is reported that the greatest concentration of Maori, up to 400, lived in Port Levy (Koukourārata).

⁶ Couch, Arthur (Hiwi), *Rapaki Remembered*, Te Waihora Press and The Canterbury Maori Studies Association, Christchurch (1987); cited in the Registration Report for the Lyttelton Township Historic Area.

⁷ Te Tai o Mahaanui is a Statutory Acknowledgement Area promulgated under the Ngāi Tahu Claims Settlement Act 1998 (Schedule 101).

⁸ Introduction to Section 6.6 of the Mahaanui Iwi Management Plan (page 249).

⁹ Mahaanui Iwi Management Plan, page 256.

Mātaitai reserve in Rāpaki Bay although Rāpaki are seeking a much larger Mātaitai reserve for the upper half of the Harbour as shown in Figure 1.3.

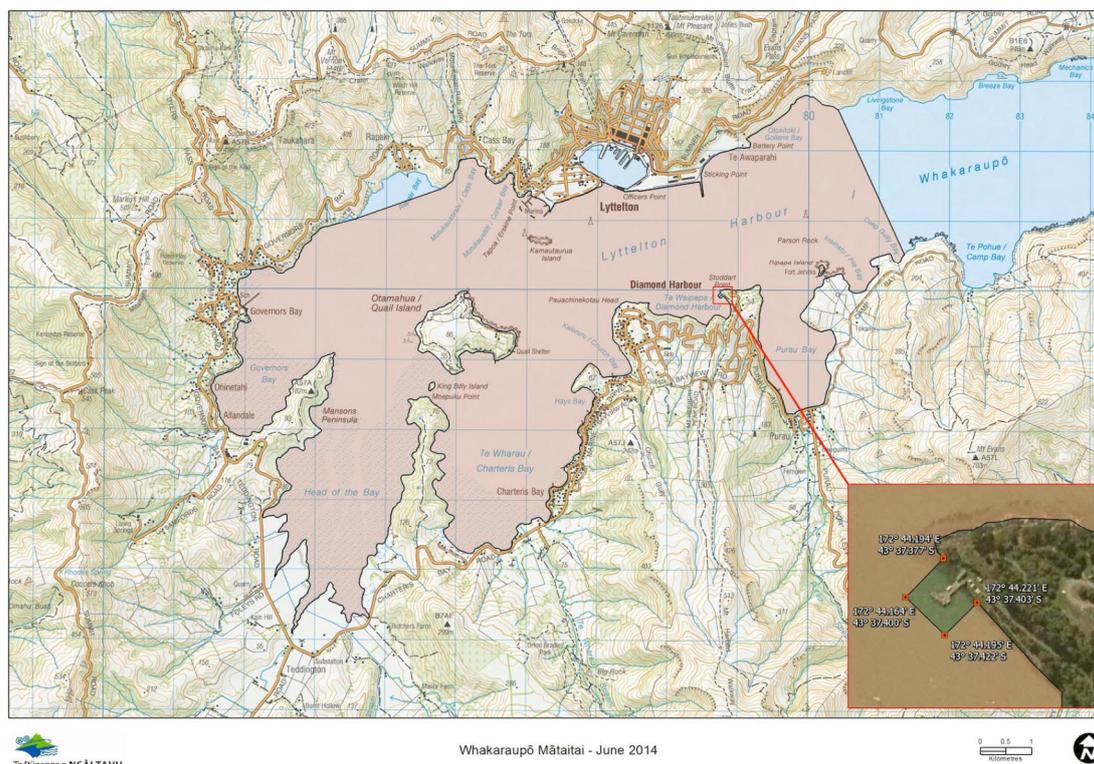


Figure 1.3: Map of the Proposed Whakaraupō Mātaitai Reserve. Source: Te Rūnanga o Ngāi Tahu.

Lyttelton Harbour also falls within the Banks Peninsula Marine Mammal Sanctuary that now extends from the Waipara River to the Rakaia River, and out to a distance of twelve nautical miles. The sanctuary was created around Banks Peninsula in 1988 to protect Hector's dolphins from being caught in set nets. Trawl nets with defined low headline heights may now only be used within two nautical miles of the shore and seismic surveying work is also controlled within this area.

1.1.3 European settlement and the port

So far as is known, the first European to actually visit the district was Captain Chase in the *Pegasus* in 1809. In 1830 Captain Morrell anchored here in the *Antarctic* the first whaling ship to have entered the inlet. Lyttelton Harbour then became known as Port Cooper. Whaling visits continued, but on a much reduced basis, up until about 1840, and from the early 1840s a period of 'squatting' began, which prefigured formal settlement.

On 10 August 1849 Walter Mantell, Commissioner of Native Lands, obtained Ngāi Tahu signatures to deed of purchase by the Crown of the Port Cooper and the Port Levy 'blocks.' Within a year Port Cooper had been selected as a colony by the Anglican Canterbury Association chaired by Lord Lyttelton.

The idea of Lyttelton Township and the port were conceived in 1847 by Edward Gibbon Wakefield and John Robert Godley, who formed the Canterbury Association as part of their planned programme of systematic colonisation.

The survey of the new town of Lyttelton was completed by the end of September 1849 by Captain Joseph Thomas and Charles Torlesse, and on 30 August 1849 Lyttelton was gazetted as a port of entry. Cavendish Bay beach was modified with a seawall, culverts and a 45m long by 4.5m wide

jetty and from this time on Lyttelton Port has become an integral part of the Lyttelton Harbour environment.

The township soon had over 200 inhabitants and grew from there. The port and township were given a major boost when a decision was made to construct a rail tunnel between Lyttelton and Christchurch. It was the first in the world to be driven through the rim of an extinct volcano and the Lyttelton rail tunnel was opened in 1867.

In 1876 the Lyttelton Timeball Station was erected and that year started signalling Greenwich Mean Time to ships in the harbour.

The Lyttelton Harbour Board was established in 1877 and was responsible for the management of both the commercial and recreational facilities of the harbour. The Board consisted of 13 members elected at the Local Body Elections every three years and representing areas which extended from the Rangitata River in the south to the Conway River in the north.

As Christchurch and its hinterland developed, so did the port. This included the building of the moles to protect shipping from harbour winds, the reclaiming of land to provide flat cargo handling areas, and, with the advent of containerisation, the establishment of Lyttelton as a container port in the mid-1970s.

As roads were established around the harbour so did small settlements, which today consist of both holiday and permanent residential homes. However, eastward of Diamond Harbour and Lyttelton Township, there are few settlements except for rural dwellings on the southern side of the harbour and small settlements at Purau and Camp Bays.

1.1.4 Amenity and landscape

In terms of the visual landscape, the outer harbour is more exposed to coastal weather with a stronger natural character. It has a history of military defence with remnant gun emplacements, tunnels, and other structures on headlands and vantage points.

Pastoral farming is the main rural land use although a number of areas in both private and public ownership have been left to regenerate back into native bush.¹⁰

Banks Peninsula as a whole is considered to be a regionally outstanding landscape¹¹ although a detailed landscape study identifies the crater rim areas and some key headlands as chiefly being the areas that have outstanding values.¹²

Lyttelton Harbour is an important destination for recreationalists both on and off the water. There are two yacht clubs located in the harbour: The Naval Point Club at Lyttelton and the Charteris Bay Yacht Club. In addition wind surfers, sea kayakers are frequent users to the harbour, as do motorised craft. There are a number designated swing mooring areas and boatshed areas as well as jetties in various bays throughout the harbour.¹³ People also swim at various bays and at Port Levy. A number of Lyttelton-based commercial recreation companies also operate in the harbour.

¹⁰ Banks Peninsula was close to 100% forested when Europeans arrived but by the turn of the 20th Century had little more than 1% cover. Today it is estimated that about 15% is in bush or scrubland. Source: Banks Peninsula Landscape Study, 2007 (Boffa Miskell Ltd).

¹¹ 2013 Canterbury Regional Policy Statement.

¹² Banks Peninsula Landscape Study, 2007 (Boffa Miskell Ltd).

¹³ These are shown on the Regional Coastal Environment Plan Maps, November 2015.

Most recreational fishing takes place from boats in the outer harbour. However, the lack of water clarity does often affect the fishing and diving experience.¹⁴ The best recreational fishing is reported to be a long way further off the coast or alternatively further up the coast off Motanau or up at Kaikoura.

On land, there is a number of Crown and Local Government Reserves with associated walkways and mountain bike tracks that are managed by the City Council and the Department of Conservation.¹⁵ Godley Head is an important visitor destination not only for its views but also because of its military heritage associated with World Wars I and II military buildings and gun emplacements constructed to protect the harbour and Christchurch.

Otamahua/Quail Island is also a visitor destination. It was originally used as a quarantine station and a small leprosy colony was placed there by the early European settlers.

The island was then leased out for farming, but since the 1970's has become a recreational reserve and today the focus is on restoring native vegetation. Lyttelton Port Company has been in partnership with, and supported, the Otamahua/Quail Island Ecological Restoration Trust since 1993. In addition to native vegetation planting, predator control measures have been introduced to foster the reestablishment of a population of the rare White-flipped Penguin on the Island.

As with the Port, the wider harbour has suffered significant damage from the earthquake. There is numerous evidence of slips and rock falls, with some bluff and cliff areas still deemed unsafe. The bluffs above Sumner Road require stabilization before this road reopens. Houses have been lost or significantly damaged and many of Lyttelton township's heritage buildings have been demolished.

1.1.5 Lyttelton Port

Lyttelton Port is the international gateway for the South Island with Christchurch being the major distribution centre for inbound goods. Export cargo originates from across the South Island. Export customers include a wide variety of dairy, meat, forestry, horticultural, mineral extraction and manufacturing businesses.

LPC's landholding covers a total area of some 149 hectares, extending from Magazine Bay in the west to Gollans Bay in the east. The container terminal is operated from Cashin Quay which is situated at the eastern edge of the Township adjacent to Te Awaparahi Bay. The port operates continuously i.e. 24 hours each day and 7 days per week.

¹⁴ Comment from Canterbury Sports Fishing Club members during consultation.

¹⁵ There are also walkways on private farmland. This includes the well-known Orton Bradley Park which is run by a body corporate and registered as a charitable trust, and further afield, the Banks Peninsula Walkway.

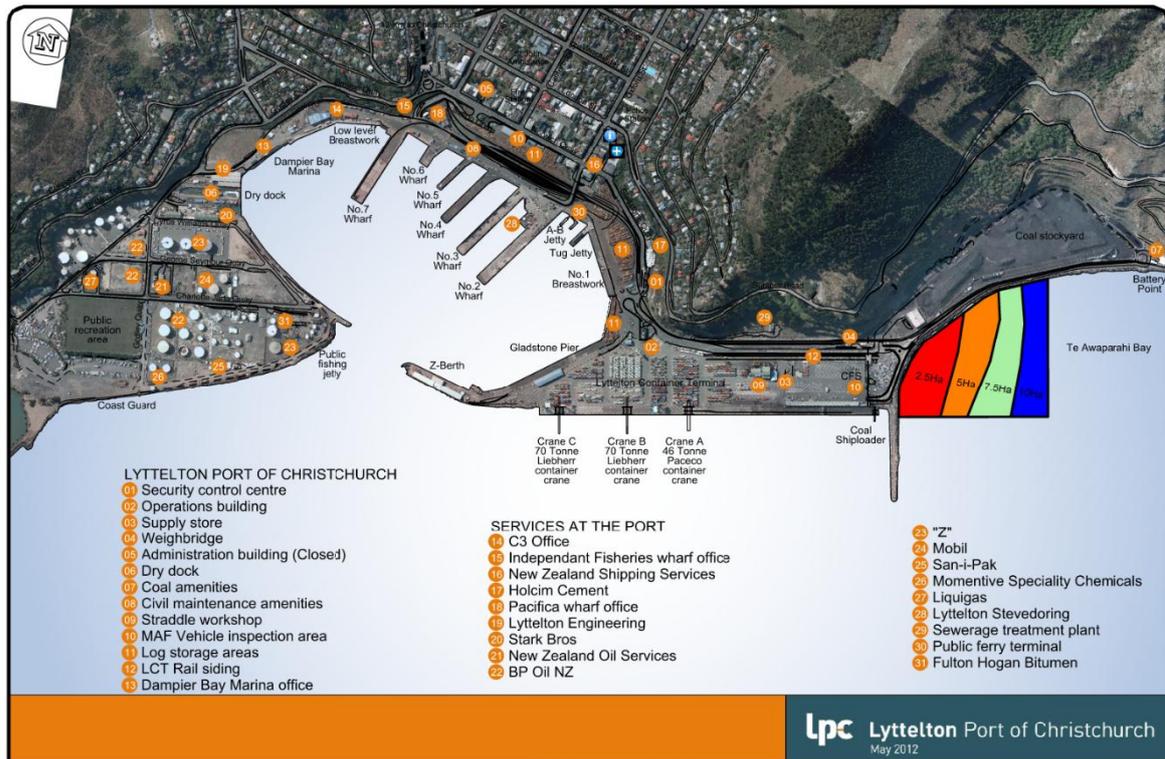


Figure 1.4: Layout of the Lyttelton Port (A larger version is included in Appendix 1)

The working Port creates an active industrial character to the coastal edge of the town. From Naval Point to Battery Point port activities include: Magazine Bay recreation marina and boat access area, fuel unloading and storage at the "Tank Farm", dry dock and maintenance of boats, an inner port recreation marina, ship berthing and unloading and loading of logs, cars and other cargo at Piers 2-7, a ferry terminal to Quail Island and Diamond Harbour, container port with large cranes approximately 80m in max height and storage areas, coal storage and loading, and land reclamation in Awaparahi Bay.

As at 30 June 2014, the Lyttelton Port Company had \$248.9 million dollars' worth of property, plant and equipment. During the year ended 30 June 2014, the company collected \$115.8 million in revenue, provided 525 jobs and paid \$42.3 million in salaries and wages. It spent \$49.0 million on goods and services, much of this going to local Canterbury suppliers¹⁶. Lyttelton Port is also recognised as a "lifeline utility"¹⁷ and is also identified as regionally significant infrastructure and strategic infrastructure for greater Christchurch.¹⁸

1.2 Recent port history

The following sections outline the recent port history leading up to, through and following the earthquakes. This provides important background to the ports operations, freight growth and challenges caused by the earthquakes

¹⁶ Copeland & Co Ltd, "Lyttelton Port Recovery Plan Assessment Of Economic Effects", October 2014

¹⁷ s60 of the Civil Defence Emergency Management Act, 2002

¹⁸ Regional Policy Statement for the Canterbury Region prepared under the Resource Management Act, 1991.

1.2.1 2009 – The end of the GFC

In 2009 the world's economies were recovering from the global financial crisis (the 'GFC') and Lyttelton Port was seeing an increase in trade. Container volumes reached a record level of 259,933 TEU's and volumes were expected to continue to climb. A new shipping service to North Asia was also secured. The Solid Energy Coal contract was extended to 2026 with strong growth forecasts for coal volumes. Other trades were also increasing and LPC was in the midst of planning and implementing development strategies to enable it to handle the current and future growth across the business, particularly the container terminal and coal storage.

At this point in time, the container terminal occupied only the western two-thirds of Cashin Quay, with the remainder used for cars, general cargo and break bulk. The large export shed behind the CQ1 berth was removed at the end of 2009 to make way for the container terminal expansion. All other wharves at the port, aside from No. 4 wharf and Gladstone Pier in the Inner Harbour, were in use in 2009.



Figure 1.5: Aerial image of Lyttelton Port in 2009 (image courtesy of Google Earth)

Measures were taken to increase freight handling capacity, including implementation of a rail shuttle service between the Inland Container Port (City Depot in Woolston) and wharf side, moving towards a 24 hour operation at the City Depot, additional log storage areas (adjacent to Norwich Quay) and upgrading parts of the oil berth.

A number of long term projects were also underway, including the coal yard expansion project. This project aimed to increase the size of the coal stockyard by creating new land in Te Awaparahi Bay and by further excavation into the hillside behind the coal yard.

It was also becoming clear from global shipping trends that Lyttelton would need to have capacity to handle the new larger and deeper draught ships that the industry was using. As a result LPC had begun the process of preparing for the application of a capital dredging consent to allow these larger ships to enter and berth at Lyttelton.

Demand for cruise ship berths was also increasing and planning and discussion with key partners was underway for provision of a dedicated cruise berth at Lyttelton.

1.2.2 2010 – The start of the earthquakes

2010 was a busy year for the port with container trade seeing a 5.3% growth, reaching 273,789 TEU's and a 58.7% increase in log volumes. 2010 also saw the first 4,500 TEU capacity ship visit to New Zealand, including a stop at Lyttelton.



Figure 1.6: Aerial view of Lyttelton Port in 2010 (image courtesy of Google Earth)

LPC continued to plan for growth by increasing the landside capacity at the container terminal. Half of the space made available by the removal of the export shed at CQ1 was developed and re-paved, allowing the container yard to expand to the east. The rail siding at the container yard was modified to increase receival capacity and a new rubber tyre gantry was purchased to aid in train loading/unloading. Operational improvements were also made which allowed the productivity of the container yard to increase by 5.8%.

A resource consent application for the reclamation portion of the coal stockyard expansion project had been lodged with Environment Canterbury and was notified for public submissions. A new Lamella plant was also built at the coal yard to better treat the coal stormwater.

The programs of modifications to existing operations and planned development projects were expected to provide for the forecasted demand in the near future. Planning was also underway for longer term expansion projects to handle the predicted significant increase in container freight. This included consideration of reclamation in Te Awaparahi Bay to enable expansion of the container terminal.

The 7.1 magnitude earthquake on September 4th caused significant damage and immediately changed the future of the port. The majority of the damage caused was slumping of land behind CQ1, CQ2, Z berth and Gladstone Pier with subsequent damage to the wharf structures and landside pavements. Notwithstanding this damage, the port's core services were operational within a few hours and the entire port was operational within 48 hours. A program of engineering assessment, insurance discussions and temporary repairs was commenced.

At this stage recovery of the port due to the earthquake damage, while still encompassing significant amounts of work, was not seen as significantly disrupting the ability of LPC to plan for long term growth.

1.2.3 2011 – February 22nd and ongoing earthquakes

The magnitude 6.3 earthquake which struck 2km west of Lyttelton at 12:51 on February 22nd caused massive devastation to the Port, Lyttelton Township and Christchurch. Every part of the Port was damaged in some way with most of the significant infrastructure effectively destroyed or requiring extensive repairs. The Port could not resume limited core services until 96 hours after the event. Container and fuel services recommenced on day 6, the first Fonterra train arrived on day 8 and the first coal train arrived on day 12.

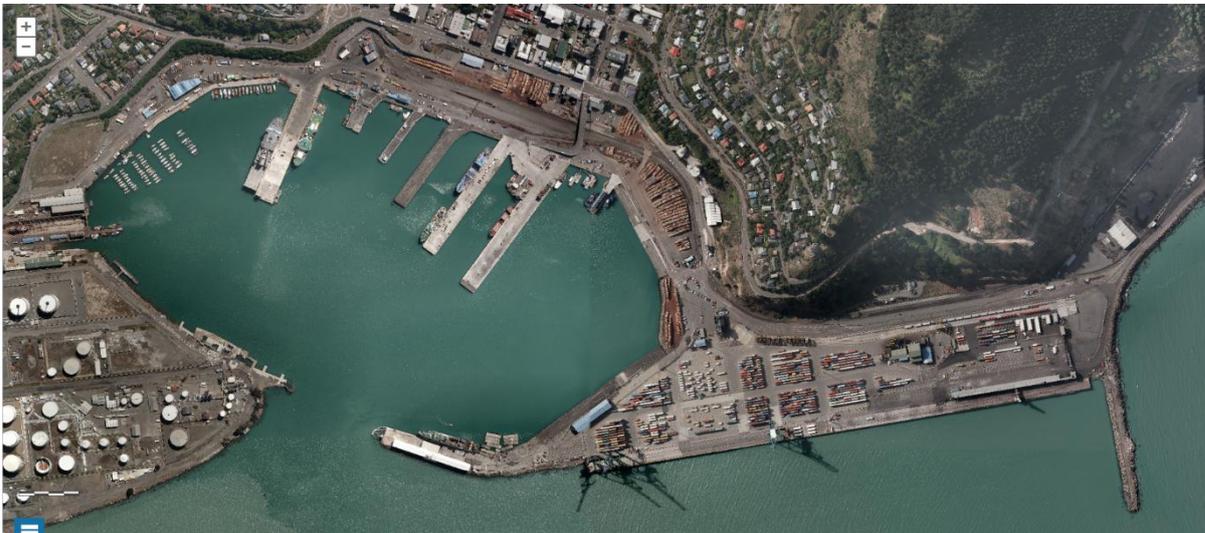


Figure 1.7: Aerial image of the Port -24 February 2011 (image courtesy of www.canterburymaps.govt.nz)

LPC rapidly began assessing the damage to ascertain which structures could be used and what temporary repairs could be made to enable further structures to be used. A summary of the damage of key assets is included in Table 1.1. Many structures could still be used but with very limited functionality. An example of this is the coal loader, which was operable but could not be moved along the wharf. As a temporary solution the ships were moved along the berth to fill the various holds, a costly solution but one which enabled coal exports to continue.

As a key part of the transport infrastructure, the Port played an important role in the immediate recovery. The Naval Frigate Canterbury was already in Port as part of an exercise, and following the wharf being checked for safety, the frigate began unloading supplies to help in the recovery effort. The Naval ships Otago, Pukaki and Resolution also berthed at Lyttelton during the following weeks and formed a vital part of the immediate recovery effort.

Following the initial assessments, a program of detailed engineering evaluations commenced to ascertain the specifics of the damage and the level of future resilience of the structures. The very complex process of preparing an insurance claim also began.

Despite the earthquakes and the damage 2011 was a record year for the port with 290,842 TEUs handled by the container terminal, an increase of 6.2% over 2010. Other trades also increased with coal up by 5.2%, logs increased by 8.7%, however ship number dropped by 17.1%. This was largely due to large cruise ships not being able to visit the port (due to damaged wharves) and a reduction in coal ships.

Handling these freight volumes with badly damaged port infrastructure was a very significant challenge. It placed huge demands on the port staff as well as the remaining working wharves and equipment. Useable space for cargo and container storage became a premium and land

constraints on freight capacity became a reality far earlier than had been predicted. This was compounded as temporary repairs began, further taking up space on valuable port land.

Post February 22nd the usual dangerous goods and over dimension load route (Sumner Road) was no longer available. Since then the narrow and tortuous route of Gebbies Pass (an additional 40km) must be used for all over dimension loads and some dangerous goods. Certain types of dangerous goods can travel through a closed tunnel, this has resulted in approximately 4,500 closures per year.

In an effort to provide a solution to the land constraint and the disposal of earthquake rubble from Christchurch, LPC sought authorisation under the CER Act to enable the consenting of the 10ha reclamation in Te Awaparahi Bay using demolition rubble. The effects assessment from the planned coal yard extension reclamation was used to support the application and consent was granted by ECan and Christchurch City Council (CCC) in June 2011 via an Order in Council. The reclamation was commenced soon after.

1.2.4 2012 – Detailed engineering assessment of the damage and insurance claims

The focus of 2012 was carrying out detailed assessment of the earthquake damage across the port, preparation of insurance claims and undertaking the urgent temporary repair projects. The damage assessment and insurance claim preparation took up a huge amount of engineering and LPC staff time across all departments. Significant aftershocks were still occurring, with six aftershocks over magnitude 5 in 2012. This was further complicated by the LPC office building being assessed as unsafe resulting in evacuation and relocation to the City Depot in Woolston.

In addition to the large earthquake driven workload, the operational side of the business was seeing significant increases in freight volumes. Container volumes reached 336,182 TEU, an increase of 15.6% from 2011, coal volumes increased by 15.6%, logs by 8.8%, cement by 47% and dry bulk by 17.4%.

A number of operational changes were made to increase efficiency and cope with the lost land and damaged facilities. City Depot moved to a 24 hour operation and the truck entry kiosks hours were extended. The operation of the port was continually reconfigured to match demand, with damage to Cashin Quay resulting in a greater reliance on the Inner Harbour wharves.

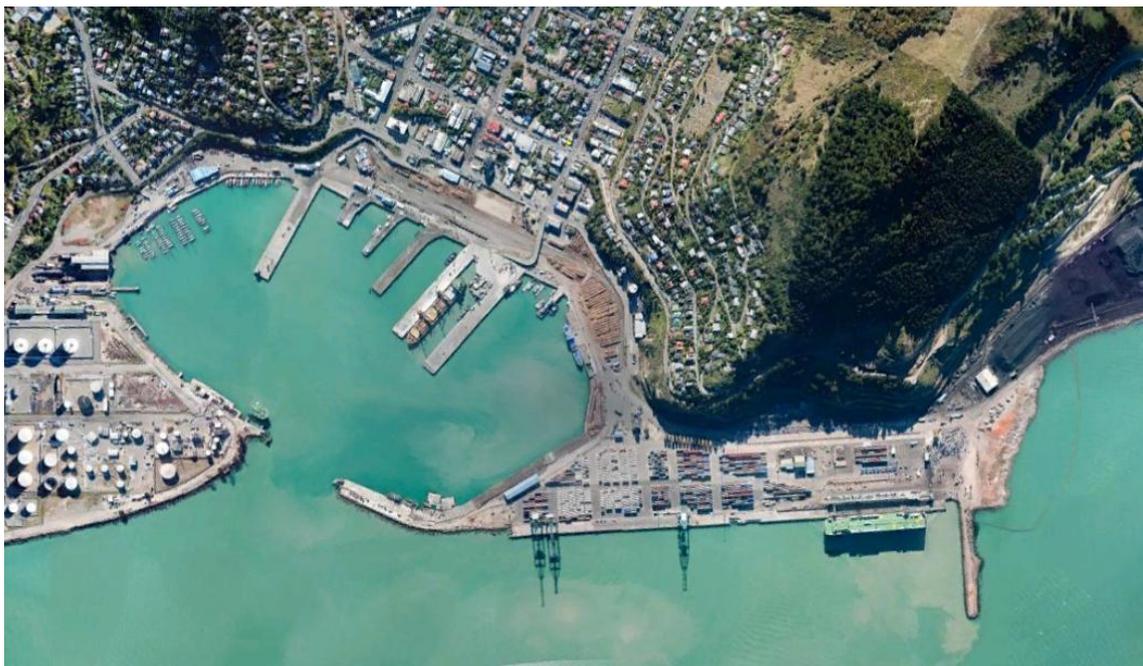


Figure 1.8: Aerial image of the Port –April 2012 (image courtesy of Google Earth)

A number of large temporary repairs were either completed, or underway. The coal ship loader was repaired to full mobility, a very complicated 12 month project which cost in excess of \$20 million. A total of 43,000m² of pavement and roadways were also repaired, a real challenge in the midst of a very busy operational port. The Lamella plant was repaired to ensure coal yard stormwater was being effectively treated.

Planning and preliminary design was underway for the rebuild of CQ2 wharf and the land behind the wharf. This included planning of how the container operations were going to cope with the loss of terminal space due to the construction works at CQ2.

Good progress was being made on the 10ha earthquake rubble reclamation, with up to 1,200 trucks arriving with rubble every week. A total of 2.7ha of land was reclaimed in 2012.

1.2.5 2013 – Further repairs and insurance settlements

The major aftershocks had ceased and the focus of 2013 shifted to completing detailed engineering assessments, undertaking further temporary repairs, working towards final mediation with the insurers and detailed design of the first major wharf rebuild – CQ2. LPC also set up a team dedicated to the recovery and development of the port. This included a Development Manager working with a team of Project Directors and Project Managers.

Freight volumes showed strong increases, the increased pace of the rebuild may have been driving some of this demand with a 9.1% increase in container imports from 2012. Overall container volumes rose to 351,217 TEUs, a 4.5% increase and a new service to USA and Europe was secured. Other freight also showed strong growth with dry bulk up 11.2%, cement increased by 42.4%, logs by 30.9% and cars by 24.6%. Two new bulk shipping services were also secured.

The increased container volumes, while being handled, was beginning to create logistical and operational challenges for both the port and external transport operators. Additional container storage areas were desperately needed and planning was underway to develop a full and empty container yard on the earthquake reclamation. Whilst this would provide some short term capacity, the distance from the ship to the proposed additional area was over 700m, too far to enable efficient operations in the medium to long term.



Figure 1.9: Aerial image of the Port -August 2013 (image courtesy of Google Earth)

The preparation and negotiation of the insurance claim was a significant focus for many of the ports senior management and external consultants. This culminated with a successful mediated settlement in the last week of 2013 of \$438.4 million. This was not only an important financial milestone, it also allowed LPC to start to crystallise plans about the best and most efficient way to rebuild the port. Due to LPC's insurance policy being 'like for like' LPC were previously unable to consider other rebuild options other than a direct replacement of what LPC had, regardless of business need or functional obsolescence of the structures. The eventual settlement does not limit the ways in which LPC can rebuild the Port.

Consequently, near the end of 2013, with more clarity about the insurance process, LPC began to assess the best way to rebuild a modern efficient port at Lyttelton. As the current port layout was largely designed for sailing ships (inner harbour) and pre container trade (Cashin Quay) the entire port layout needed to be re-thought. Key aims of the recovery planning were:

- To ensure the ongoing operation of the port throughout the recovery process,
- To ensure the port could handle the increase in freight volumes during the recovery period
- The rebuild and reconfiguration of the port would allow for future freight types and growth for 30 years
- To ensure the new facilities were designed to ensure a safe, environmentally sound and efficient operation

Work on a 30 year redevelopment plan commenced and progress was made on how to communicate this to the community and LPCs stakeholders.

1.2.6 2014 – Post settlement – the recovery begins

2014 continued the trend of increasing trade volumes with container volumes up by 7.2% to 376,576 TEU's from 2013. Coal volumes increased by 2.7%, logs by 62.7%, vehicles by 14.7%, dry bulk by 18.4% and fuel showed a slight decrease by 6%. Ship visits increased by 14.5% to 1,059 visits, an average of almost three ships per day.

As part of the program of increasing capacity of the port, a new Liebherr ship to shore crane was delivered and is now operational. The first major recovery project, the rebuild of CQ2 commenced and at the time of writing the first sections of the wharf deck had been poured. The earthquake rubble reclamation has progressed well with over 6ha of land created. In order to replace lost container yard space (due to CQ3 construction area) and create additional capacity the container terminal was extended to the east onto the reclamation. The reclamation is also being used for car storage and construction laydown areas, reducing some of the pressure on the available cargo storage areas elsewhere at the port.

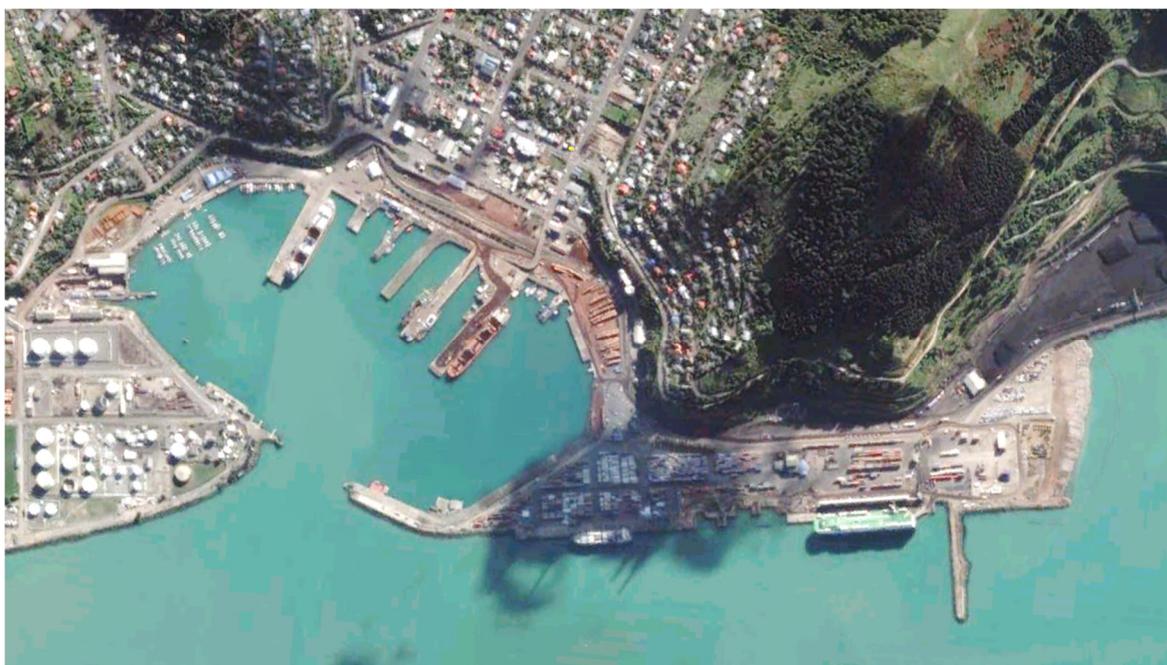


Figure 1.10: Aerial image of the Port -September 2014 (image courtesy of Google Earth)



Figure 1.11: Current reclamation (under the 10ha consent) – original shoreline is at rear of photo in the location of the road and rearward container stack.

In June 2014, the Minister for Earthquake Recovery, Hon Gerry Brownlee jointly directed LPC and ECan to prepare a Lyttelton Port Recovery Plan. The purpose of the recovery plan was to allow the port to undertake recovery in a timely manner. The direction required LPC to prepare a package of information detailing LPCs plans, the effects the plans might have and to undertake consultation on the proposals. A significant amount of work, involving a wide range of experts from across New Zealand, was undertaken in the latter half of 2014 to prepare this package of information.

The 30 year vision for the ports development (the Port Lyttelton Plan) was released in June and set out at a high level the \$900 million rebuild, reconfiguration and enhancement plans for the port. Port Talk, a consultation space on London Street, Lyttelton, was opened so the public could talk to us about the Port Lyttelton Plan. A number of stakeholder workshops were also held and a dedicated website (www.portlytteltonplan.co.nz) was set up to provide information and a means for the public to provide feedback.

The first project that forms part of the long term vision was initiated with the purchase (subject to conditions) of a 27ha site in Rolleston. The site is destined to become an inland port, a facility

where container freight can be consolidated and staged onto rail. This will reduce pressures on the road network and increase the efficiency of our container freight operation.

1.3 Summary of earthquake damage

As briefly set out above, the series of earthquakes caused a large amount of damage to almost every piece of infrastructure at the port. While there are some very visible damage at the port, much of it is underwater or below ground. The detailed engineering assessment showed that whilst most of the assets are technically destroyed, they can still be used but have a much reduced life and significantly higher maintenance costs. They also have a reduced resilience to future earthquakes.

The detailed list of the damage runs to many tens of pages and includes a level of detail which is not appropriate for this document. In order to provide a level of understanding of the range and severity of damage sustained, a summary of the damage to each asset has been collated in Table 1.1. This also includes how useable the asset is post-earthquake.

Table 1.1: Summary of earthquake damage and usability

Asset	Use at time of earthquakes	Damage	Useability post-earthquake
Coal stockyard	Stockpiling coal	Coal Stormwater treatment plant damaged required minor repairs to regain function Minor slips behind yard required inspection before re-establishing operations Some water ingress into train unload facility and damage to concrete structure.	Useable within days of earthquakes with reduced stormwater treatment capacity
Coal transfer system and shiploader	Unloading railcars and loading ships	Significant damaged resulted in complete loss of function. Transfer Tower & Coal gallery suffered significant differential settlement resulting misalignment of conveyors Minor repairs required to restore limited function Major repairs required to restore full function	Useable within days of earthquake with significant reduced function Ongoing issues with higher frequency of breakdown due to misalignment and increased maintenance costs Lower levels of resilience than pre-earthquake, but able to match Solid Energy supply chain resilience
Cashin Quay breakwater	Wave protection for Cashin Quay	Significant settlement resulted in major temporary repairs to re-establish function. Estimated total repair cost at \$7-8M	Was used throughout, however with limited functionality. Temporary repairs to restore full function completed within weeks of earthquake Ongoing lower levels of resilience Repair work was delayed by lack of access to Port Quarry and full repair work yet to be completed.
Cashin Quay 1 (CQ1)	General cargo and coal ship loader	Major damage to both structure and seawall. Majority of wharf capacity downgraded to light traffic only. Major temporary repairs (circa \$20M) required to re-store function of coal ship loader.	Limited function restored within days of earthquake – vessel berthing only – vessels loaded with stationary ship loader. Temporary repairs completed within months of earthquakes however the berth is no longer useable for general cargo except cars at eastern end. Lower levels of resilience than pre-earthquake, but able to match Solid Energy supply chain resilience
Cashin Quay 2 (CQ2)	Container/Cruise Ships	Destroyed, rebuild project currently underway (\$85M)	Unusable
Cashin Quay 3 (CQ3)	Container ships	Significant damage to structure and seawall. Deemed uneconomic to repair and written off by insurer.	Limited functionality restored within days – predominantly repairs to land behind structure to allow access Significant temporary works completed in months after quake to maintain operations Ongoing lower levels of resilience higher maintenance costs and significant shortening of asset life (minus 20+ years)
Cashin Quay 4 (CQ4)	Container ships	Significant damage to structure and seawall. Deemed uneconomic to repair and written off by insurer. Replacement cost of CQ3 and 4 estimated at between \$120-130M	Limited functionality restored within days – predominantly repairs to land behind structure to allow access Significant temporary works completed in months after quake to maintain operations Ongoing lower levels of resilience higher maintenance costs and significant shortening of asset life (minus 20+ years)
Z Berth	Fishing berth	Wharf Destroyed Significant damage to seawall with settlement of up to 1.2m and significant displacement of rock armouring	Wharf Unusable Seawall repairs completed in weeks after earthquake – permanent repair yet to be completed.
Gladstone Pier	Vessel layover	Wharf Decommissioned prior to earthquakes however significant damage to seawall similar to Z berth	Unusable
No.1 Breastwork	Cement transfer	Minor damage to both seawall and structure Structure close to end of life prior to earthquakes.	Re-usable within days of earthquake following minor repairs. Parts of wharf decommissioned and no longer usable. Shortening of asset life (minus 5+ years). Asset has now reached end of life and requires replacement.
Tug wharf	Tug berth	Minor damage to tug wharf deck but building seriously damaged	Wharf re-usable with days following minor repairs, however building only partially useable today.
Ferry terminal	Diamond harbour ferry and historic tug	No damage to floating pontoons – damage to seawall did not affect function	Usable throughout
No.2 Wharf	General cargo	Damage to deck, piles and seawalls lead to significant inspections prior restoring service. Replacement value estimated at between \$40-45M	Re-usable within days of earthquake following repairs. Shortening of asset life (minus 20+ years)

Asset	Use at time of earthquakes	Damage	Useability post-earthquake
No.3 Wharf	General cargo	Damage to deck, piles and seawalls lead to significant inspections prior restoring service. Deemed uneconomic to repair and written off by insurer. Replacement value estimated at between \$40-45M	Re-usable within days of earthquake following repairs. Shortening of asset life (minus 20+ years)
No. 4 Wharf	Vessel layover	Completely decommissioned following earthquakes	Not usable
No. 5 Wharf	Fishing and vessel layover	Wharf was close to end of life prior to earthquakes. Parts of asset decommissioned	Suitable only for vessel layover, no longer used for fishing trade
No. 6 Wharf	Fishing and vessel layover	Damage to piles, deck and seawall. Parts of asset decommissioned	Suitable only for vessel layover, no longer used for fishing trade
No.7 Wharf	General cargo and Pacifica containers	Damage to deck, piles and seawalls lead to significant inspections prior restoring service. Southern end detached from main structure and required temporary works to re-attach.	Re-usable within days of earthquake following repairs. Southern end decommissioned for all but pedestrian access Shortening of asset life (minus 25+ years)
Low level breastwork	Inshore fishing fleet	Significant damage to seawall has resulted in damage to structure.	Ongoing use with reduced deck loadings within days of earthquakes Parts of wharf permanently decommissioned
Marina	Recreational vessels	No damage reported	Useable immediately after earthquakes
Dry Dock	Ship repair and maintenance	Minor damage to water treatment plant and increased levels of fresh water ingress. Minor structural damage to dock structure. Significant damage to adjacent slipway has resulted in lower levels of service. Pump house and administration facilities destroyed	Dry dock usable within weeks of earthquakes following establishment of temporary pump house and administration facilities. Slip way yet to be fully repaired.
Cattle jetty	Fishing vessel layover	Destroyed	Un-usable
Oil berth	Fuel, oil, LPG and bitumen transfer	Damage to deck, piles and seawalls lead to significant inspections prior restoring service. Deemed uneconomic to repair and written off.	Re-usable within days of earthquake with significantly reduced levels of service. Significant repairs required to restore levels of service in months after earthquake. Ongoing reduced deck loadings to pedestrian access only. Shortening of asset life (minus 25+ years)
LPC admin building	LPC offices	Destroyed	Used within hours of earthquakes but subsequently evacuated following detailed engineering review - Un-usable
Container terminal building	Container terminal offices and logistics	Significant damage to structure from differential settlement. Parts of the building decommissioned for safety. Rebuild estimate \$4-5M	Re-usable within hours of earthquake following inspection. Part of building permanently decommissioned Shortening of asset life (minus 20+ years)
Straddle maintenance building	Maintenance workshop	Minor damage to structure from differential settlement and lateral spread resulted in minor damage	Re-usable within days of earthquake following inspection.
Container terminal pavements and infrastructure	Pavement, electrical, lighting and water infrastructure	LCT pavement suffered significant damage. Services remained usable following re-establishment of supply.	Partial service restored for pavements within hours. Major temporary repairs to LCT pavements required to restore full service. Significant reduction in asset life (minus 25+ years) combined with significantly higher maintenance costs for pavements.
Power systems	Port wide LPC owned power network	Parts of (ring main) electrical network lost Damage to switches contained within damaged buildings	Service restored within hours of earthquakes. Excavation of electrical services (11kV network) has revealed significant levels of damage that have required replacement. Electrical network has significantly reduced levels of resilience due to incomplete ring main and likely stressing/stretching of buried infrastructure
Internal port roadways	Internal transport of cargo	Significant damage to roadways from damage to seawalls. Stormwater drainage has reduced effectiveness	Service restored within hours however major repairs required to restore full levels of service.

1.4 User requirements

The port has a large range of Users, from large international shipping companies through to the owners of inshore fishing vessels and recreational boat owners. To ensure that the port is redeveloped in a way that meets the needs of its users, LPC has undertaken a detailed review of current and potential future port users and their associated requirements. This work informs LPC's decisions on how infrastructure solutions could best be configured to meet the requirements of the users and other stakeholders in the short, medium and long term. Whilst the resulting report is for internal LPC use only, a summary of the results is included in the following sections.

Figure 1.12 provides an idea of the relative economic importance of each of the trades through the port (by revenue value). The figure is based on 2012/13 financial year data, but supplemented with typical pre-earthquake cruise vessel calls.

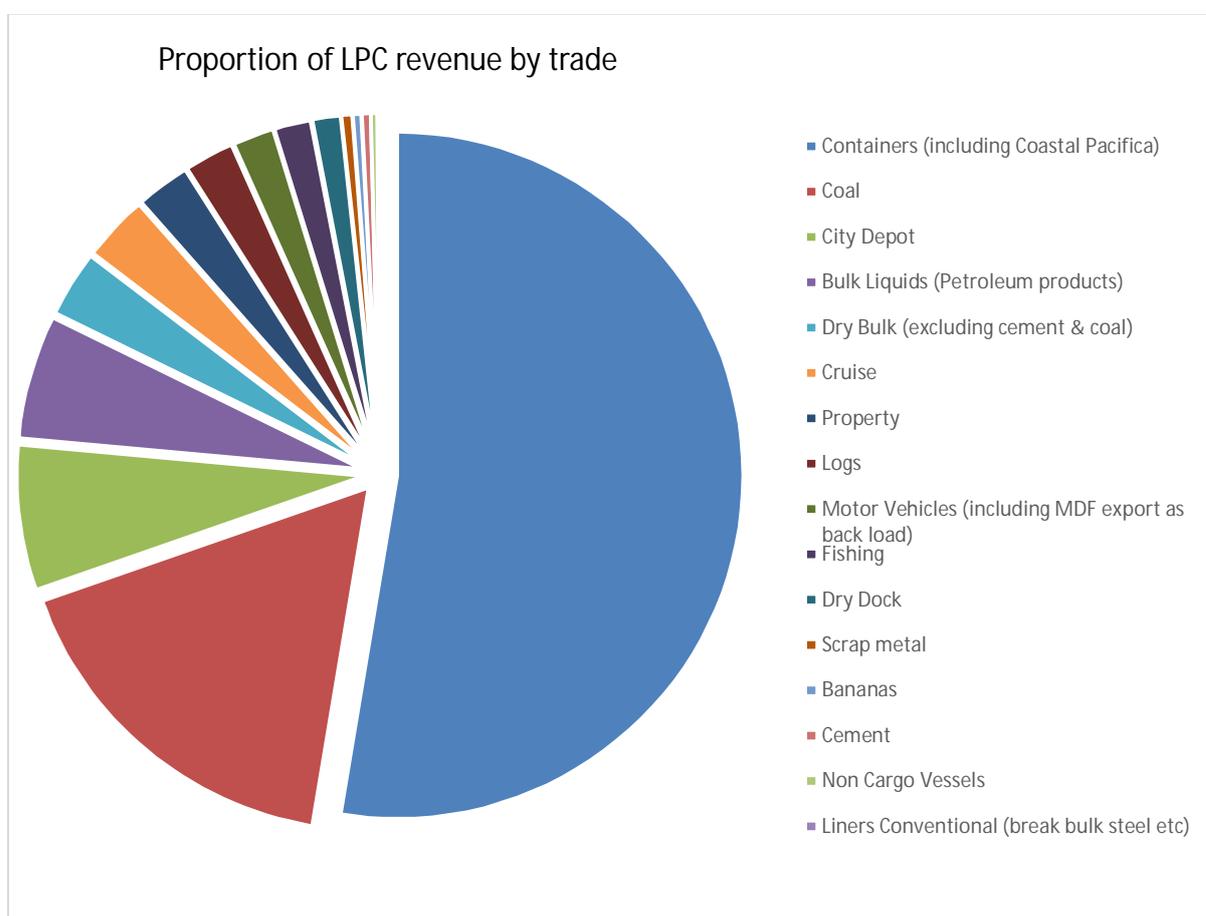


Figure 1.12: Proportion of LPC revenue by trade

A number of the trades handle cargoes with similar 'Port Operations'. For the purposes of defining User Requirements various trades have been rolled up into thirteen groups. Each of the trades which require similar port operations are classified together in Table 1.2.

There is also requirements for customs and quarantine inspection facilities to support some of these trades. The provision of these functions and the associated infrastructure are managed by the relevant government bodies with support from LPC, but are not discussed further in this section.

Table 1.2: Summary of Port Operations Classifications

Trade
Containers (including Coastal Pacifica)
Coal
Bulk Liquids
Break Bulk: Logs, Scrap Metal, Bananas, Liners conventional
Dry Bulk (excluding Cement & Coal)
Cement
Motor Vehicles (including MDF)
Cruise
Fishing
Dry Dock
Non Cargo Vessels
Recreational vessels
Ferries and tourism vessels

1.4.1 Containers

Key users of the container terminal are LPC (as stevedores of the terminal), shipping companies, MAF, road transport operators, KiwiRail and Customs.

The current container terminal has capacity to receive vessels up to a Post Panamax class (4,500 TEU¹⁹) with container handling achieved via four container cranes and a straddle carrier operation. In order to meet the future needs of shipping companies the port proposes to provide for larger vessel sizes with the Maersk S-Class(8160 TEU) (Figure 1.13) as typical of this larger vessel. The following table sets out the principal characteristics of the current, proposed and minimum container vessels for Lyttelton.

Table 1.3: Summary of Key Characteristics for Container Vessels calling to the Port

Description	LOA	Beam	Sailing Draught	Capacity
Typical current	266m	37.3m	12.1 m	4,500 TEU
Likely future maximum	350m	43.0m	14.5 m	8,160 TEU
Minimum vessel size	130m	22.8m	8.2 m	---

The terminal needs to provide sufficient storage for conglomeration of export containers for efficient loading, unloading of imports and space for storage of empty containers. Transfer facilities capable of efficiently dealing with truck and rail transport modes are also needed. Support services such as security control, dangerous goods storage, operation buildings, customs facilities and container washdown are also required. Appropriate lighting and appropriately designed operational layouts are necessary to provide a safe terminal.

¹⁹ Twenty foot equivalent unit (TEU) is the standard measures of container volume and represents a conversion to a twenty foot container i.e. a 40 ft. container would be two TEU.



Figure 1.13: Maersk S-Class Container Ship

1.4.2 Coal

The key port users and stakeholders include LPC as terminal operator, shipping companies, Solid Energy Ltd, Kiwi Rail and potential future Mines.

Currently up to Panamax class bulk carriers are received at the port and it is not expected that significantly larger ships will service the coal trade in the future. Table 1.4 sets out the characteristics of the current maximum and minimum coal bulk vessels that Lyttelton services.

Table 1.4: Summary of key characteristics for Dry Bulk Carriers calling to export coal

Description	Approximate Capacity (DW tonnes)	LOA	Beam	Sailing Draught
Maximum Vessel (Panamax)	70,000	230 m	32.3 m	12.5m to 13.7m
Minimum Vessel	20,000	161 m	23.8 m	9.4 m

Coal vessels currently berth at Cashin Quay No.1 (CQ1) and presence of the coal loading plant dictates that this will remain the case for the foreseeable future.

The coal stockyard can currently store 325,000 tons and this may need to increase if coal volumes rebound. The current facilities at the stockyard include rail line, bottom dump receiver, import loader system, dust control infrastructure, stormwater treatment (Lamella Plant), mobile plant and export conveyor including the bucket loader. These facilities will essentially be retained although modifications and upgrades may be needed to cope with growth.

1.4.3 Bulk liquids

The bulk liquids trades are all handled via the oil berth at Naval Point and supported by the (non LPC owned) transfer and storage infrastructure on land. Key users of this facility are LPC (as berth owner and operator), the shipping companies and Coastal Oil Logistic Ltd (COLL) who represent the four main oil companies operating at Lyttelton.

Products handled at Lyttelton under the bulk liquids trade include Jet A1, Diesel, petrol, LPG, Methanol, Bitumen and Bunkering fuel.

Currently the port receives regular visits from ships up to 183m long, but like container ships, bulk liquid carrier size is increasing. It is possible that the infrastructure will need to provide for a vessel size of 240m in the future (see Table 1.5).

Table 1.5: Summary of key characteristics for Bulk liquid carriers calling to the Port

Description	Approximate Capacity (DW tonnes)	LOA	Beam	Sailing Draught
Existing Max	47,726	183m	32.3m	12.0m
Likely future maximum	80,000	240m	40.0m	13.5m [#]
Min	3,000	86m	14.3m	5.5m

Any new structure will need to be designed to cope with sea level rise and have sufficient resilience to provide its lifeline functions post disaster. The wharf needs to provide liquid transfer systems, appropriate spill and fire control measures, provision for a loading crane and platform as well as stormwater management. The area around the oil berth will need to be accessed controlled with an appropriate security system.

1.4.4 Break bulk

Break bulk is a combination of trades which are loaded individually, not containerised or loaded in bulk (like bulk dry goods i.e. cement) and include, for example, the following goods:

- Scrap export
- Steel import
- Banana import
- Logs export



Figure 1.14: Exporting Logs, a substantial break bulk trade

Key port users for Break Bulk are the stevedoring companies, logging companies (PF Olsen, Laurie Forestry, Rayonier etc), exporters and importers and shipping companies.

Currently the largest vessels service break bulk are approximately 190m long with the future maximum predicted to be up to 210m long (see Table 1.6).

Table 1.6: Summary of key characteristics for Break bulk carriers calling to the Port

Description	Approx. Capacity (DW tonnes)	LOA	Beam	Sailing Draught
Current Maximum - Logs	55,566 t	190 m	32.3 m	11.20 m
Current range - general	7,709 t -31,000 t	117 m - 193.9 m	20.0 m - 30 m	5.1 m -11.20 m
Current Minimum	7,709 t	117 m	20.0 m	5.1 m
Likely future maximum	60,000 t	210 m	32.3 m	12.5 m

Break bulk currently use on ship cranes to load/unload cargo and this is likely to continue for the foreseeable future. The wharf structures need to have capacity for truck and trailer units, mobile cranes, forklifts and cargo loads as well as appropriate security and stormwater management. Any new structure will need to be designed to cope with sea level rise and have sufficient resilience to provide its lifeline functions post disaster.

Some cargoes, particularly logs, require yard areas on port to enable conglomeration of cargo prior to vessel loading. The size, layout and proximity of the yard to the wharf are important aspects for loading efficiency. Berth selection is influenced by adjacent land availability and future layouts may be able to address the current constraints on log yard layouts and size.

1.4.5 Dry bulk (excluding cement)

Dry bulk is the importation of bulk dry goods such as fertiliser, gypsum and grain. Key port users for dry bulk include fertiliser importers (Ballance and Ravensdown), grain importers, gypsum importers (Winstone wallboards), stevedoring companies and shipping companies.



Figure 1.15: Bulk Materials Imports

Currently the largest dry bulk ships are 190m long and this is not anticipated to change in the foreseeable future (Table 1.7).

Table 1.7: Summary of Key Characteristics for Dry Bulk carriers calling to the Port

Description	Approximate Capacity (DW tonnes)	LOA	Beam	Laden Draught
Current	52,483 t	190 m	32.0 m	12.1 m
Likely future maximum	57,000 t	190 m	32.0 m	12.1 m
Minimum	5,000 t	106 m	15.0 m	6.1 m

Dry bulk currently use on ship cranes to load/unload cargo to trucks via on-wharf mobile hoppers. Other transfer solutions may be needed in the future. The wharf structures need to have capacity for truck and trailer units, the wharf hopper and cargo loads as well as appropriate security and stormwater management. Any new structure will need to be designed to cope with sea level rise and have sufficient resilience to allow for loading of food and supplies post disaster.

1.4.6 Cement

Currently the sole bulk cement importer to the port is Holcim, with two vessels servicing this trade (Table 1.8). Cement is handled solely on the No.1 Breastwork which is adjacent to the Holcim silos.

Table 1.8: Summary of key characteristics for dedicated cement carriers

Name	Approximate Capacity (DWT)	LOA	Beam	Laden Draught
Milburn Carrier II	8,465	118.5	16.8	7.4
Westport	4,081	94	14.0	4.7

The two vessels serving this trade are dedicated coastal ships operated by Holcim and it is anticipated the ships will continue to service this trade.



Figure 1.16: Milburn Carrier

The cement ships require specialised transfer equipment that is connected to the on-site storage infrastructure (which is owned by Holcim). In addition to standard wharf infrastructure (lighting etc.) appropriate stormwater management is needed given the nature of the product.

1.4.7 Motor vehicles

The motor vehicle trade is focussed around imported cars and machinery although some domestic movement also occur by sea. The vehicle vessels are also often used to backload with Medium Density Fibreboard (MDF) for export. Key port users for this trade are shipping lines, stevedoring companies, importers, vehicle transport companies, MDF exporters and MAF.

Current maximum vessel size is 200m long and this is not expected to change in the foreseeable future, although tonnage may slightly increase (Table 1.9).

Table 1.9 Summary of key characteristics vehicle carriers calling to the Port

Description	Approximate Capacity (tonnes)	LOA	Beam	Laden Draught
Likely future maximum	20,000 t	200 m	32.3 m	10.5 m
Current Maximum	18,418 t	200 m	32.3 m	9.8 m
Current Minimum	9,274 t	165 m	26 m	7.7 m

Current average offload numbers range from 1,100 to 1,800 vehicles per vessel although peaks for up to 2,400 can occur. The offloaded vehicles are stored on port for an average of four days. This allows time for MAF clearance and the time needed for pickup by transport companies. A large area of parking space (16m²/vehicle), relatively close to the berth, is needed for this storage.

The berth needs to have capacity for heavy vehicles and width to cope with the unloading ramps. The yard needs to include lighting, security and appropriate stormwater controls.

1.4.8 Cruise

Only the small cruise ships, which can enter the Inner Harbour, have been able to visit Lyttelton post-earthquakes. Pre earthquake Lyttelton received the large cruise ships and industry trends are for the vessels to increase in size. Any new infrastructure will need to account for this growth in vessel size, and at this stage the design vessel is the Sunshine Class ships with a length of approximately 350m (Table 1.10).

Table 1.10 Summary of key characteristics largest cruise vessel to call at Lyttelton

Description	Approximate Capacity (DW tonnes)	LOA	Beam	Laden Draught
Max Vessel (pre-earthquake)	115,875	290 m	37.5 m	8.05 m
Likely future maximum	160,000	348 m	49m	9m

Cruise ships typically only berth during the day, travelling between ports at night. The berth needs to be 100% available for cruise ships during the season which runs October through to February. Outside the season the berth would have little to no visits from cruise vessels.

The wharf structure only needs to provide service to a portion of the vessel, enough for passenger handling. The wharf needs to be able to support light vehicles.

Coach, taxi and minivan parking will be needed on land, as will some type of secure facility to process passengers. This may also serve as a waiting area for passengers who are leaving or returning from day trips. Outbound tour operators may also want the ability to have on site offices – possibly only temporary. All infrastructure and supporting facilities will need to provide for disabled and limited mobility access.

1.4.9 Fishing

The fishing trade comprises the larger offshore vessels (i.e. factory trawlers) through to the smaller local inshore fleet. Current users are the larger fishing companies such as Independent Fisheries and the owners and operators of the inshore vessels. All of the fishing fleet is serviced within the Inner Harbour.

Currently the largest fishing vessel to use the port are factory trawlers with a length of approximately 106m (Table 1.11). This is not expected to change markedly in the future.

Table 1.11: Summary of key characteristics fishing vessel to call at Lyttelton

Description	Approx. Capacity (DW tonnes)	LOA	Beam	Laden Draught
Factory Trawler (current and future design vessel)	115,875	106 m	16.0 m	5.90 m

Fishing vessels have two distinct requirements of the port; short term berthing to transfer stores and unload catch during the season and long term berthing for layover during the off season. Fishing vessels also take on fuel at Lyttelton.

The wharfs that service the stores and catch transfer need to support the cargo handling equipment and the cargo itself. Appropriate lighting, security and stormwater controls are needed on the wharf. The layover facility only needs to have capacity to berth the ships. The smaller inshore fleet require permanent mooring, currently provided within the Inner Harbour.

1.4.10 Dry dock and marine engineering

The Lyttelton dry dock is one of only two in New Zealand and serves an important role, providing vessel maintenance and refit facilities. The users of the dock are the vessel owners and operators, the companies that provide the marine engineering services and LPC as owner and operator of the actual dock.

The dock can service a maximum vessel size of approximately 118m in length. Holcim's Milburn Carrier II is the largest ship that can fit within the dock, and her dimensions are set out in Table 1.12.

Table 1.12: Summary of key characteristics largest vessel which dry dock can accommodate

Description	Approx. Capacity (DW tonnes)	LOA	Beam	Laden Draught
Milburn Carrier II	8,465	118.5	16.8	7.4

The needs of the users of the dry dock are unlikely to change in the future, although there may need to be an increased level of environmental control. This may alter the way some work is undertaken and how discharges are treated.

1.4.11 Non-cargo vessels

In addition to the aforementioned cargo vessels, a number of large non-cargo vessels also use the port i.e. Antarctic research vessels, general research vessels and Navy Ships. These vessels have a range of requirements, however in general they all need a wharf that can provide transfer of cargo, stores and personnel. The wharf needs to have capacity to carry heavy vehicles and loading equipment and have the appropriate security, lighting and stormwater controls.

Table 1.13 Summary of key characteristics largest vessel which dry dock can accommodate

Description	Approx. Capacity (DW tonnes)	LOA	Beam	Laden Draught	Comment
Navy	9,000 t	131.0 m	23.4 m	5.4 m	RNZN Canterbury
Research		109.5m	9.9	4.95 m	MV Aaron

1.4.12 Recreational users

The large majority of recreational vessels (motor boats, yachts, small craft etc.) that use the harbour do so via the various Christchurch City Council or boating club owned ramps and structures (i.e. Naval point public ramps club ramps). The main recreational users of the port are the vessel owners who moor their yachts and power boats at the existing Dampier Bay marina. There is also a small publically accessible ramp on the southern side of Starks Brothers site at the dry dock. This is rarely used, typically only when southerly conditions render the ramps at Naval Point unsafe.

There is significant demand for additional marina berths, evidenced by the 99 people on the waiting list for the existing Dampier Bay marina. A range of berth sizes and types is needed to suit the variety of vessel sizes and types owned by the prospective users.

In addition to the demand for additional capacity, there is also demand for more modern facilities, such as a secure walk on floating pontoon configuration with water and power to the berth. Associated on land facilities such as car parking, rubbish disposal, showers/toilets and marina office would need to be provided adjacent to the marina.

1.4.13 Ferries and other tourist vessels

Black Cat Cruises operate the Diamond Harbour Ferry, wildlife cruises and a tourist service to Quail Island. These services also operate from a floating finger jetty to the east of No.2 wharf, with public access via the Oxford Street Bridge. The Tug Lyttelton Preservation Society runs regular and charter trips on the historic tug Lyttelton (1907) from the east side of No.2 wharf. Jack Tar sailing operates sailing charters out of the Dampier Bay marina.

Whilst it is not expected that the vessels size for these operations will change markedly, there are needs for additional amenities to support these operations. This includes simpler and safer public access to the vessels and better on land facilities such as all-weather shelters, offices, ablutions etc.

As the Diamond Harbour Ferry serves as a commuter connection, there needs to be good connection to the bus network as well as good pedestrian access to Lyttelton Township. The new facility proposed at Dampier Bay will have sufficient space to enable these to be provided.

1.5 Freight demands: now and in the future

Over 99% of international freight is handled by sea freight in New Zealand, as an island nation we rely on the 'blue highway' to deliver our goods to the international market and to receive imports. As New Zealand population and economy grows, particularly productive sectors, the need for sea freight increases. The increasing import/export freight volumes have been a consistent pattern in the past and is expected to continue.

LPC specific freight volume forecasts are derived from a range of data associated with the long term growth of the regional economy, in addition to specific initiatives and opportunities around both export and import trade growth. Due to the difficulty in splitting out what freight is specifically for recovery purposes and difficulties forecasting the speed and scale of the City's recovery, LPC's current forecast projections do not include allowance for earthquake recovery driven growth. The Port is however beginning to see sharp increases in rebuild related goods, a good example of this is cement volumes which increased by 40 percent in 2013 compared to 2012.

In the year to 30 June 2014 major cargoes shipped via the Lyttelton Port included

- Containers: 376,567 TEU
- Coal: 2,069,432 tonnes
- Bulk Fuels: 1,044,189 tonnes
- Motor Vehicles: 40,778 units
- Logs: 601,485 tonnes
- Fertiliser: 369,553 tonnes
- Cement: 200,327 tonnes

Significant growth in a number of trades is forecast over the next 20 – 30 years, with the major growth forecast for containerised cargo, where volumes are forecast to reach 782,000 to 1,500,000 TEU by 2041. LPC's volume projections and the basis for the projections are outlined for each major cargo below.

1.5.1 Container trade

Container volumes moved through the Lyttelton Port (and all New Zealand Ports) have grown significantly over the past 15-20 years. In 1994 76,000 TEU were moved through LPC. In 2014 this increased to over 376,567 TEU, up 7.2% on the previous year. In 1994, around 545,000 TEU were shipped through NZ Ports, increasing to over 2.6M in 2013 (an average increase of around 8.7 percent per annum).

The following graphs show the growth in container volumes for NZ and the South Island (by Port) over time.

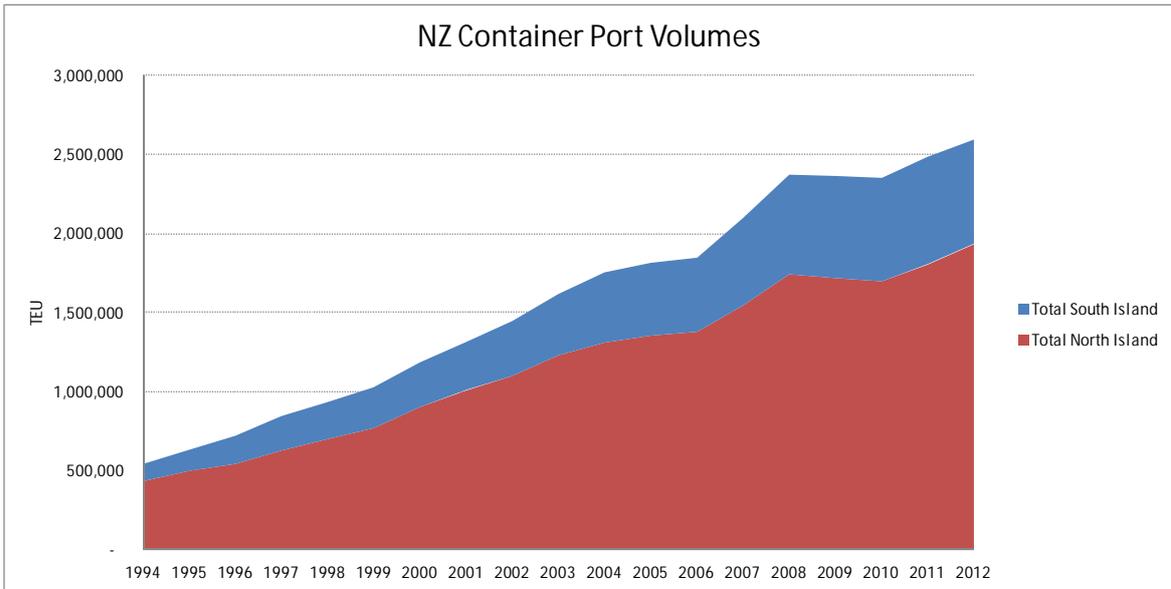


Figure 1.17: NZ Container Port Volumes

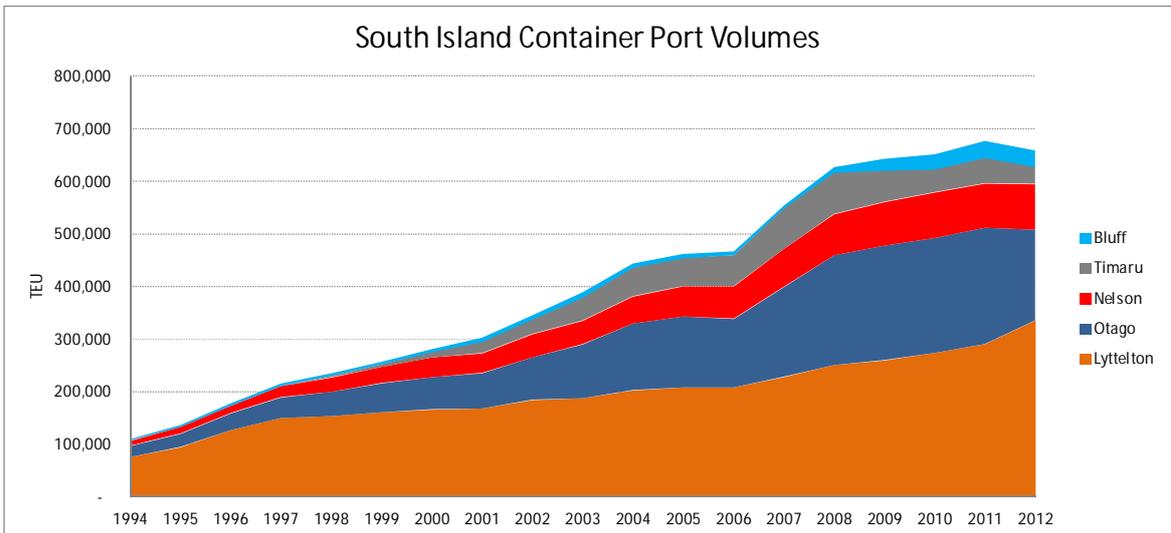


Figure 1.18: South Island Port Volumes

Growth in container volumes is expected to continue with Lyttelton’s volumes currently forecast to reach up to 1.5M TEU by 2041, reflecting a compound average growth rate over the period of 5.1 percent.

Lyttelton container growth has resulted from both import and export increases as well as greater containerisation of general trade volumes. While the trend to containerisation is now mature, Lyttelton exhibits continued organic trade growth from its immediate trade catchment and ability to aggregate volume from outside the region.

LPC’s growth projections are for between 7-8 percent per annum for the next 3 years, reducing to 6-7 percent for the following 3 years. Thereafter they reduce to around 4.5 percent per annum.

LPC’s container growth projections are largely driven by increased economic activity and GDP growth, increased dairy production and irrigation schemes as well as gains resulting from the impact of larger vessels. These are outlined in further detail below.

1.5.1.1 Economic growth

LPC's growth projections are largely based on projected growth in gross domestic product (GDP). The relationship between GDP and freight volumes is widely recognised within the industry with the general rule of thumb being growth in freight volumes of 2.0 – 2.5 times the increase in GDP.

- The Supply Chain Digest (a US-based supply chain management and logistics publication) recently completed a study examining the relationship between container growth and GDP on a global basis since 1990. The study found that although the multiplier effect has weakened it remains strong at around 1.5 - 2.5 times.
- Another study by Auckland Regional Holdings²⁰ makes reference to the international shipping industry rule of thumb for container growth as being GDP x 2.0 – 2.5 times.
- Conservatively, LPC has assumed that container volumes increase at around 2.0 times the increase in GDP.
- Economic growth in Canterbury averaged 2.1 percent between 2000 and 2010 – though container growth was much higher. Canterbury Development Corporation (CDC) has forecast base economic growth of 2.3 percent per annum in the post-rebuild period, though notes growth may be enhanced by increased exports (meeting the Government's China export growth targets), increasing irrigation and maximising earthquake recovery opportunities.
- The Treasury's '2013 Economic Outlook' forecasts the NZ economy to grow at a rate of 2.5 percent per year until March 2017. Applying a conservative GDP multiplier of 2.0 to this projection results in a compound average growth rate of 5 percent to 2017.
- Analysis undertaken by Rockpoint Corporate Finance utilising the short term growth projections of Treasury combined with forecast population growth of Statistics New Zealand forecasts the total container trade in NZ to grow from 2.5M TEU in 2012 to 9.0M TEU in 2042 (reflecting a compound average growth rate of 4.36 percent). It is understood this analysis applies an extremely conservative GDP multiplier of 1.5.
- It is important to note the current container imbalance when examining the GDP multiplier. Currently 30 percent of containers imported to NZ are empty. Therefore, increased container exports will also require the import of empty containers to meet demand. For this reason, a GDP multiplier of 2.0 is regarded as conservative by LPC.

In addition to this generic economic activity of the wider New Zealand economy, specific areas of activity are expected to lead to greater growth of the Canterbury region. Dairy, irrigation and the use of larger vessels are examples of these areas and some further summary information on each of these areas is set out below.

1.5.1.2 Dairy sector information

Canterbury is the fastest growing dairying region in New Zealand with milk production in Canterbury growing at 5 percent per annum.²¹ Dairy exports currently make up 24 percent of New Zealand's total merchandise exports (based on value) – up from 20.2 percent in 2007. The value of dairy exports via Lyttelton account for 20 percent of New Zealand's dairy exports based on value (up from 5 percent in 2007).

The value of New Zealand's dairy exports increased by \$4.0 billion over the five years to 2012. Canterbury was a significant contributor with the value of dairy exports via Lyttelton increasing by \$1.9 billion for the same period. The development of Fonterra's milk processing site near Darfield

²⁰ Long-term optimisation of the New Zealand port sector, October 2009.

²¹ Source: Brown, Copeland & Co Ltd.

has significant capacity which is already contributing to increased container exports out of Lyttelton.

The 'Situation Outlook for Primary Industries' produced by the Ministry of Primary Industries (2014) regards the long term outlook for the dairy sector as being positive with the existing growth path expected to continue.

1.5.1.3 Irrigation sector information

The Central Plains Water scheme, which will take water from the Waimakariri and Rakaia rivers to irrigate the Central Canterbury Plains, will increase the agricultural productivity of the Canterbury region significantly in the future. It has been stated that once the scheme is fully operational, annual direct and indirect regional agricultural output is expected to increase by \$437 million. From a port and freight standpoint that will translate into a notable increase in supply chain activity.

Economic modelling of proposed irrigations schemes in Canterbury indicate that if these were to come to fruition there is the potential for approximately \$1.1 billion in extra value-add to be generated in the region. This work was commissioned by CDC with the Agricultural and Economic Research Unit (AERU) at Lincoln University, to look at the economic value of irrigating all the available and suitable land and the flow on to businesses which support the agricultural sector. The results are based on an additional 250,000 hectares of land being irrigated (as per suggested availability in the Canterbury Water Management Strategy).

1.5.1.4 The impact of larger vessels

LPC considers that it is inevitable that as the shipping industry trends towards bigger ships, ports located near larger population centres capable of handling bigger ships will prosper at the expense of regional ports that do not have the capability or major markets directly adjacent.

A progression towards larger container vessels calling at New Zealand Ports over the next 5 to 10 years is expected. Shipping lines are looking to match capacity with demand and take advantage of the economies of scale that exist with operating larger vessels. The National Infrastructure Plan (2010) has identified the likelihood of larger (6,000+ TEU²²) ships visiting New Zealand.

In 2010 the New Zealand Shippers Council undertook a study on the potential benefits of introducing bigger container ships (5000 – 7000 TEU) on New Zealand's trade routes, or alternatively the likely consequences of not introducing them. Container growth projections by the Shippers Council adopted in their analysis was 5 percent.

The study concluded:

- New Zealand could realise up to NZ\$144 million per year of net supply chain benefits from 2015/16 with bigger ships operating on the South East Asia route only, and with infrastructure developments at two ports to become 7000 TEU ship capable.
- If ports are not capable of handling bigger ships within 5 years, there is a risk services could become more boutique in nature. That would mean only relatively small and old vessels (by international standards) with higher operating cost per containers could be accommodated by the ports.
- Lyttelton Port was the logical first South Island port to become bigger ship capable because (a) it is the largest container port in the South Island in terms of both import and export volumes; and (b) development costs to accommodate 7,000 TEU ships at Port Lyttelton

²² The National Infrastructure Plan (2010), National Infrastructure Unit, New Zealand Government

were considered to be lower than at Port Otago. Lyttelton and Tauranga are also the largest bulk ports in New Zealand and there is an opportunity for bulk cargo owners to leverage off investment in bigger ship capable facilities at these ports. Given the short timeframes in which Lyttelton has to become capable of handling bigger ships (i.e. likely within 5 years), the Port requires some certainty to ensure it is able to plan for, and adequately repair the Port in such a way that will ensure the region can benefit (i.e. from increased efficiencies of scale through decreased shipping costs) from being able to accommodate bigger ships.

Like all competitive industries, the nature of the shipping industry will invariably result in peaks in troughs in annual volume. However the normal market year-to-year fluctuations do not change the long term growth trends that exist.

The following graph shows LPC's historic and forecast container volumes. For comparison compound average growth rates of 5.0 percent and 4.36 percent have also been plotted. Growth of 5.0 percent reflects the current economic growth forecast of Treasury to 2017 with a GDP multiplier of 2.0 applied. Growth of 4.36 percent reflects Rockpoint Corporate Finance's estimate for NZ container volume growth which is understood to apply a GDP multiplier of 1.5 to Treasury's growth forecast while taking account of projected population growth.

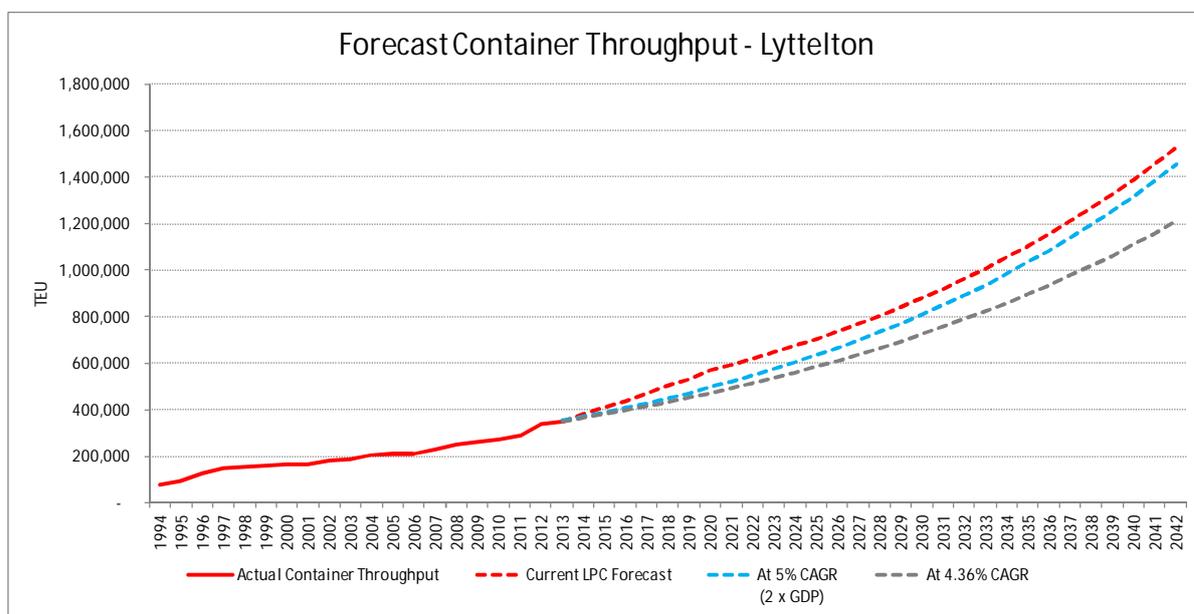


Figure 1.19: Forecast Container Throughput - Lyttelton

As can be seen in the chart above, in all cases, significant growth in container volumes is expected. It is therefore critical that the necessary Port infrastructure be developed to cater for the increased demand, in such a way that ensures the infrastructure is resilient. Failure to cater for the demand will likely hinder economic performance and very likely would adversely affect the economic recovery of the wider region.

1.5.2 Bulk and break-bulk commodity volumes

Volumes of bulk and break-bulk trade (logs, motor vehicle, heavy machinery – excluding coal and oil) through Lyttelton are often cyclical in nature. However, over the long term material growth in these trades is expected.

Dry bulk volumes are forecast to grow at a blended rate of 2 percent annually, while bulk fuels are assumed to grow at a higher rate of 4 percent. Total bulk volumes are expected to increase by

around 60 percent over the next 20 years (from 4.2 million tonnes in the 2013 financial year to 6.8 million tonnes by the 2032 financial year).

As outlined below, Lyttelton's two key bulk commodities without dedicated facilities, logs and motor vehicles, are interchangeable in terms of storage space. Storage areas at the Port are currently dispersed around pockets of spare land throughout the inner harbour, and at the eastern end of Cashin Quay. Storage is separated into several discrete areas of varying size, generating long and inefficient handling moves between cargo receipt and the quay. It is evident from the discussion below that the need for sufficient storage space in order for the Port to provide for the needs of exporters and importers will become more critical as volumes increase.

1.5.2.1 Motor vehicles

Motor vehicle volumes are expected to grow roughly in line with GDP at around 2.5 percent. Storage for motor vehicles is, however, constrained. Prior to the September and February earthquakes Lyttelton's storage capacity approximated 1,675 motor vehicles. Earthquake damage subsequently reduced this to approximately 1,000 motor vehicles, inclusive of unconventional storage locations such as on operational finger wharves and maintenance yards.

Not only are car volumes increasing, but the volumes of cars per shipment is increasing. As a result the overall and peak storage requirements are increasing at a time when there is strong demand for port land from other trades.

1.5.2.2 Logs

Log volumes are affected by both global demand for wood and the charter rates of bulk vessels. Due to very high charter rates experienced prior to 2007, the volume of New Zealand logs exported was low. However, with the large fall in charter rates during the global financial crisis, log export volumes rebounded. In the near term volumes are expected to stay constant on the back of strong demand.

Log storage at Lyttelton is currently insufficient to meet demand and requires exporters to schedule vessel arrivals no longer than three weeks apart. Recently, logs have also needed to be stored on temporary land in the tank farm because of insufficient space available at the Port. Transport and efficiency issues associated with this land render it only suitable as an immediate 'stop-gap' solution.

1.5.3 Cruise ships

Prior to the earthquakes LPC primarily used its Cashin Quay 2 berth to service cruise ships. In the 2009/2010 season 50 cruise ships were received, with 60 vessels expected the following season. A significant increase in cruise visits was also forecast for the 2011/2012 season. However, Cashin Quay 2 sustained significant earthquake damage and has been out of service since 22 February 2011. Due to the requirement for other berths to service cargo trades, cruise ships were diverted to Akaroa.

Few cruise ship visits are forecast until the completion of a new Cruise berth. Upon completion, cruise volumes (visits and passenger numbers per vessel) are expected to resume their historic growth path of 2.5 percent per annum, peaking at a maximum capacity of 100 cruise ship visits by the 2033 financial year. Some of the cruise ships that visit Akaroa may continue to do so even if Lyttelton was to develop a cruise berth.

Ship visits by increasingly larger vessels with more passengers will add to the economic and social recovery of the wider Christchurch and Canterbury tourism industry, as well as the recovery of those businesses, such as retail, which rely heavily on tourism expenditure. While many different

factors determine where and when cruise ships call, growth at Lyttelton could well be in addition to rather than at the expense of current ship visits to other South Island locations.

1.5.4 Summary of user requirements and freight demands

The users of the Port are predominantly commercial businesses involved in the exporting and importing of a wide range of cargoes, including containerised goods, logs, cars, fuel, coal, and bulk goods such as fertiliser and cement. These user groups require specialised unloading and storage infrastructure for bulk fuel, gas, cement and coal. Containerised cargo requires an extensive short-term storage terminal for holding containers prior to loading or unloading, or relocation to LPC's inland port in Woolston. The efficiency of the container terminal is critical for meeting user needs and for managing the wait times of heavy vehicles picking up containers. Cars and logs are space-extensive cargoes where accommodating ship deliveries requires large areas of storage space to be available. The ability to manage the through-put of cargo, within the constrained geographic context of the Port, is a key element in managing the scheduling of shipping services, the turn-around time that vessels need to be in Port, and therefore the frequency and attractiveness of Canterbury as a port-of-call for global shipping services.

In addition to commercial cargo users, fishing vessels, cruise ships, ferries and tourist charter vessels, navy and research vessels, and associated dry dock and marine engineering and provisioning services are also important users of the Port. Further to the wide range of commercial users, the Port area is also used by the community for a variety of small boat recreational activities that include yachting, motor boats, kayaks, waka ama, and stand up paddle boarding. The provision of facilities for recreational users and public access creates challenges with concurrently providing a safe and secure operational area from which to meet the needs of the Port's other users.

The volume and nature of cargo is continually changing in response to global markets, the size of vessels (with current trends towards larger vessels), Canterbury business activity and changes in land use such as increased irrigation, and competition from other ports. In order to meet ever-evolving user needs, modern Ports therefore need to have considerable operational flexibility in how they are configured so that they can continue to accommodate changes to cargo types and storage requirements and increasing cargo volumes. It is anticipated that the volume of cargo through the Port will continue to increase as the Canterbury economy grows over time. The earthquakes mean that not only has the Port essentially lost four years to plan and build for this growth, but the existing infrastructure as at 2010 has been significantly damaged and its capacity reduced. The Recovery Plan is critical to enabling the timely repair and recovery of Port infrastructure so that the Port can make up for lost time in order to ensure that the Port is able to continue to provide efficient support for the growth and recovery of Canterbury as the Region's key gateway.

2 Description of proposed recovery projects

2.1 Description of the rebuild, repair, enhancement and reconfiguration projects

A full report summarising LPC's current thinking on the repair, rebuild, enhancement and reconfiguration of Lyttelton Port post-earthquakes is set out in Appendix 2. As stated elsewhere in the information package, LPC has only been able to plan for this reconfigured port since early 2014. Consequently the information contained in the report represents early thinking on many of the projects with many of them still in feasibility or concept design phase.

In addition, the needs of the port users change regularly and rapidly, in response to global economic demands and trends in global shipping. It is likely that many of these projects will change in some way, be it the specifics of the design, the location or the intended user of the infrastructure.

In order to manage the projects, the projects are split into three groups, and these groupings are used here also. The three groups are:

- Group A Reclamation
- Group B Cashin Quay
- Group C Inner Harbour

A description of the individual projects within each group is included in the report. We have also included a description of the proposed reconfiguration of the port including the details of the proposed capital dredging of the shipping channel.

Three plans setting out the proposed recovery works are also attached at the rear of the report. These plans set out the location of the following:

- Plan 1: The rebuild and repair projects (rebuild or repair of existing assets, which may include upgrade to modern standards)
- Plan 2: The enhancement projects (construction of existing assets or infrastructure which was not present at the Port prior to the earthquakes)
- Plan 3: The reconfiguration of the Port (the proposed changed land use configuration of the port)

The project codes used in the description (such as A01) are also included on the plans to allow connection to the description of each project. Note that there are some projects that are port wide and are not graphically shown on the plans.

2.2 Proposed Recovery Program

An overall construction program is attached to the report in Appendix 2. This is the current thinking on the duration and sequencing of the projects. The overall program and sequencing will need to continuously adapt to economic conditions and the changing needs of the port's users. This could result in changes in the priority of projects, changes in sequencing or changes in required delivery timeframes. The most critical aspect to the timing and sequencing is the ability to reclaim land in Te Awaparahi Bay.

3 Recovery of the port

The earthquakes of 2010/2011 caused extensive and significant damage to the port's infrastructure, removing some from service entirely and placing severe restrictions on use of others. The damage to infrastructure and the resources needed to manage the assessment and repair process have significantly challenged the ports ability to handle current freight demands, let alone develop for future freight demands. In order for the port to recover it not only needs to rebuild existing infrastructure to cope with current demand, it also needs to enhance the facilities so when the rebuild is finished, future freight demands can be met. This can only be achieved by providing more space by reclaiming land.

In order to achieve recovery of the port, over 80 complicated and interdependent projects are needed with an estimated capital cost of over \$900 million. These projects need to be not only delivered, but delivered in the right sequence and in a timely fashion.

The key recovery aspects are set out in the following section. This details how they relate to recovery and what is needed from the recovery plan to enable the ports rebuild, repair and reconfiguration. Included in the ports recovery are aspects which will deliver on the communities long held desires for better connection with the waterfront, the port itself and the wider recreational opportunities provided by the harbour. The recovery can also deliver better environmental outcomes, better long term management of nuisance effects and provide for the economic and social well-being of Lyttelton.

3.1 Key recovery aspects

As previously stated, the recovery of the port is a very complex, costly and time consuming process involving over 80 individual projects. Each recovery project in itself is regionally significant and involves a complex series of phases in both the marine and terrestrial environment. The need to undertake many projects simultaneously, assess the cumulative effects of all projects, and be certain within each project that all other dependent projects will be authorised, while continuing to operate the Port under increasing freight demands presents significant operational and consenting challenges.

Like the project required to effect recovery, the need for recovery is complex and is related to a number of factors. At its core, the recovery needs are around undertaking a timely and expeditious rebuild of the ports infrastructure which results in a better port. Better for the ports operations, better for the ports customers, better for the community and better for the environment.

Within the complicated recovery story there are four key themes:

- Rebuilding for future freight demands – Ensuring that through the rebuild the port is enhanced and able to cope with future freight demands. Essentially this means reclaiming land to provide for more space
- Reconfiguring the port for the future – Rebuilding the port in a configuration that allows for the changing nature of freight, allows for community access and manages effects on the environment. This involves a move to the east onto reclaimed land.
- Better, more resilient infrastructure – Ensuring that the rebuilt infrastructure is designed and constructed to suit the needs of modern cargo, is resilient to natural hazards and is more protective of the environment
- A timely and expeditious rebuild – providing a process which recognises the need for an expeditious rebuild, whilst still providing appropriate controls on the effects

Overall the expeditious provision of more freight capacity, better and more resilient infrastructure at the port with a lesser effect on the environment delivers on a range of foundations and goals for recovery²³, particularly:

- A diverse productive and resilient business sector
- Effective development of the areas (Canterbury's) competitive advantage
- Provision of high quality infrastructure
- National and international connectivity
- Improving the quality and function of estuaries, waterways and wetlands to support the unique biodiversity that is endemic to Te Waipounamu

The four key themes, their importance and the specific recovery outcomes and needs for each are discussed in more detail in the following sections.

3.1.1 Rebuilding for future freight demands

The majority of the current port layout (and many of its structures) were designed and built in the early to mid-1900's. Whilst the port layout has changed little since then (particularly the Inner Harbour), massive changes have occurred in the worldwide shipping industry. Ships increased in size, containerised cargo commenced, freight handling efficiencies increased significantly, stricter security requirements were introduced and the type of freight moved around the world has changed.

In addition to the above, freight volumes have increased significantly worldwide. This growth has been driven by increases in worldwide population, global liberalization in trade and industrialisation of large emerging economies such as China and India. Technological advances, such as bigger, faster ships and more automated loading/unloading have reduced the cost of sea freight, further fuelling growth. Figure 3.1 demonstrates both the increase in global freight as well as the changing mix of freight types and Figure 3.2 shows the growth in container volumes only. The global trade impacts of the GFC in 2007-2009 are noticeable in both figures.

²³ Recovery Strategy for Greater Christchurch. Mahere Haumanutangao Waitaha. CERA, 2012.

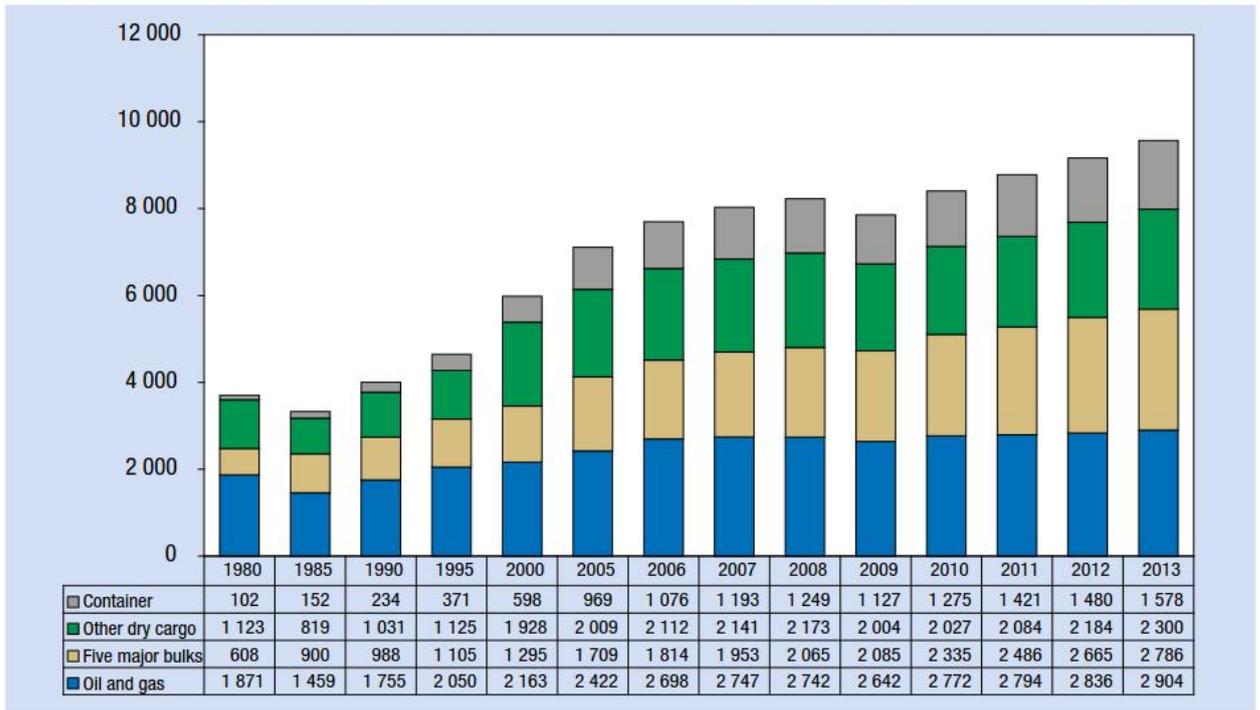


Figure 3.1: International seaborne trade (millions of tons loaded per year) from UNCTAD, 2013²⁴

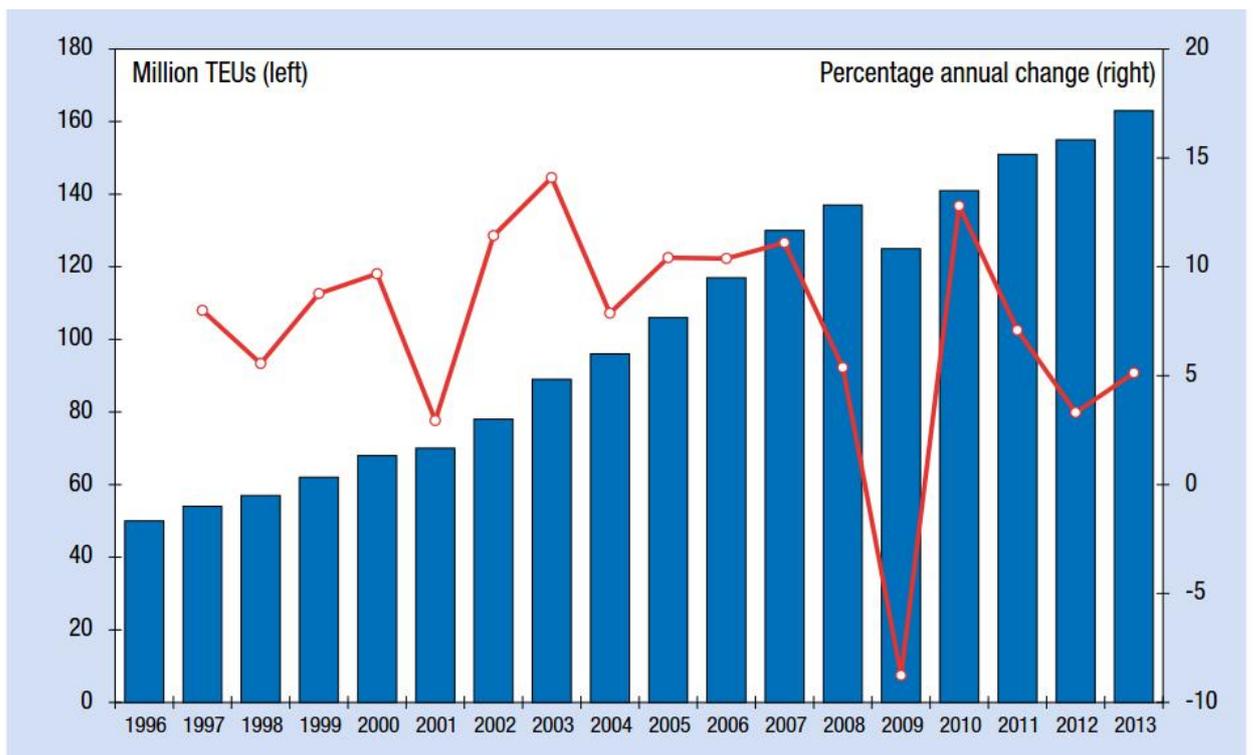


Figure 3.2: Global growth in container trade in both millions of TEUs and percentage change, from UNCTAD, 2013

²⁴ United Nations Conference on Trade and Development, Review of marine transport 2013. UNCTAD/RMT/2013

The changes in global sea freight have driven ports worldwide to evolve and adapt with new configurations, larger deeper berths, more land behind the berths and more efficient layouts and equipment. Over the last 50-60 years LPC has constantly upgraded and modified the port operations to account for the growth in, and changing nature of freight. These upgrades have seen the major Cashin Quay being built (reclamation and wharves), larger and more container cranes installed and regularly evolving landside layouts.

Plans were in place for future upgrades, including equipment upgrades for the container terminal and reclamation of more land in Te Awaparahi Bay. A consent to reclaim 10ha to enlarge the coal stockyard was lodged with the Regional Council in 2009, but halted after the earthquakes. The application was then used to support the current 10ha consent under an Order in Council. The long term plans also included a migration of the port eastward onto reclaimed land, although detailed work had not yet started.

The earthquakes halted LPC's ability to plan and deliver business as usual improvements and developments, with all expertise and energy directed to the immediate earthquake recovery. This included delaying work on long term planning. As a result LPC has been restricted in its ability to increase capacity and keep ahead of freight growth. This combined with the damaged infrastructure and space needed for rebuild project has impacted on the ports overall capacity and will do so throughout the recovery period. If the rebuild only delivers reinstatement of pre-earthquake infrastructure the ongoing freight growth will mean the capacity of the port could be 50% of the projected demand at the end of the rebuild. In order for the port to have capacity to meet freight demands at the end of the rebuild and for the next 30 years the port infrastructure must be enhanced rather than just rebuilt. The need to rebuild better by reconfiguring the port is analogous to other recovery initiatives in the City, such as the Central City Recovery plan which states:

"The Canterbury earthquakes have provided an unprecedented opportunity to rethink, revitalise and renew central Christchurch. The area can be built back better than it was before, increasing its value to the wider city, the Canterbury region, and New Zealand as a whole."

Following completion of the insurance settlement in late 2013, energies once again turned to future planning, particularly detailed thinking how the port should recover. As almost the entire port needed rebuilding it quickly became obvious that the port would need to be reconfigured and enlarged to meet future freight demands. The decision was made that the infrastructure should be rebuilt to handle changing freight modes and the predicted freight increases over the next 30 years.

The critical aspect of providing for future freight demands is the provision of more land at the port. At Lyttelton this requires reclamation, with the most feasible option at Te Awaparahi Bay. A reclamation will allow the container terminal to move off Cashin Quay, freeing up the Cashin Quay berths and associated land for other cargo. This will provide more space for all trades which directly relates to more freight handling capacity. Additional space will also ease the constraints on work areas, allow for better separation of activities and help to provide a safer port.

3.1.1.1 Container freight

Of all the trades, container freight is under the most pressure and is the Port's core freight. Container terminal capacity is mostly dependent on the amount of space available to store containers and how efficiently they are moved. The current terminal is both too small and is the wrong shape (too long and narrow). This means containers are currently being moved a long way from the ship to the storage location, resulting in relatively poor efficiencies and longer ship loading/unloading times. These two constraints mean that the Lyttelton Container Terminal (LCT)

has reached and surpassed its optimum capacity and without further changes will soon be unable to service any additional growth in the region's economy.



Figure 3.3: Current LCT showing the long distance containers have to be moved from berth (background with cranes) to storage area in foreground.

The current container terminal is approximately 15ha in size of which 5ha is used for non-storage uses (buildings, gate facilities, loading areas, parking etc.). At its present size and operation, the LCT has, at optimum operational efficiencies, a yearly capacity of approximately 250,000-300,000 TEU. This is supplemented by the City Depot through storage of empty containers. The proposed Rolleston facility will increase the overall cost efficiency of the container freight, but will not increase the capacity of the container terminal. Essentially the container terminal needs to have enough capacity to store sufficient volume of export containers (full and empty) to efficiently load ships and enough empty spaces to enable storage of containers from inbound ships. Being over the optimal capacity has a compounding effect on terminal land requirements as when the optimal efficiency is surpassed the terminal efficiency drops, resulting in a greater requirement for land to meet capacity.

In the 2014 financial year the LCT handled 376,576 TEU's which is over its optimal efficiency. This has caused decreasing efficiencies (per container) with the average container stack 1.8 high as opposed to the optimal 1.6 high. This results in having to often move one or more containers to access the target container. A consequence of being over optimal capacity has been congestion both within the yard and on the ports internal road network with trucks queuing to pick up or drop off containers. This means lost productivity for the transport operators and ultimately higher freight costs for the exporters/importers.

Thirty percent of useable (2.5ha) additional container storage space (at the far eastern end) was added mid 2014 which provided some temporary capacity relief. However this only gets LPC back to 2013's capacity requirements. In order to continue to service the container freight needs of

Christchurch and Canterbury's importers and exporters a larger, more efficient container terminal is needed.

BergerABAM, an engineering consultancy with specialist port designers, was engaged in 2013 to assess what size container terminal would be needed to service future demand. The calculations were focused on two future growth scenarios and calculated for 2026 and 2041. The analysis was based upon the current container handling mode (straddle carriers stacking 3 high) and included space for rail services, buildings, gate facilities and parking but not for any recovery related construction laydown area. An efficient shape was assumed, with the depth of land behind the berth at least 350-500m. This depth of land is as recommended by international best practise to provide an efficient container terminal (PIANC reference).

The results of the analysis are summarised in Table 3.1. The results show that meet the freight growth forecasts up to 2041 a container terminal of 34-52ha is needed.

Table 3.1: Container terminal size to provide for future demand

Year	Lower bound growth (TEU/year)	Upper bound growth (TEU/year)	Container terminal size needed
2026	435,000	571,000	21ha-27ha
2041	782,000	1,500,000	34ha – 52ha

Lyttelton Port of Christchurch – New container terminal operations: reclamation area straddle carrier operations. BergerABM report, October 2014.

The combination of the demand based terminal sizing, the geometrical requirements (two 350m long berths with 350-500m depth of land behind) results in a likely size requirement for a new container terminal of 37ha. The exact size requirements will be ascertained through a detailed terminal design process which integrates the many factors that affects a container terminals use, efficiency and capacity. Given the projected growth (both lower and upper bounds), the need to rebuild the port for the next 30 years and recommended international terminal design parameters it is very unlikely that additional land needed would be less than 37ha.

3.1.1.2 General cargo

In addition to the growth in containerised cargo, almost all other cargos are showing strong growth, particularly those related to rebuild activities such as cement. These general cargos (logs, fuel, oil, gas, fish, steel, vehicles and cement) all require space on land to store or handle the cargo. In the case of logs significant storage space is needed as an entire shipload of logs needs to be stored on port or very near to enable efficient loading. Similarly with vehicles, the unloaded vehicles all need to be stored at the port for up to 4 days. This creates a large demand on port space with a vehicle vessel arriving on average once a week.

Pre earthquakes some of this cargo was handled on Cashin Quay, but post-earthquakes almost all general cargo is handled in the Inner Harbour, aside from vehicles which are predominantly handled on CQ1. The Inner Harbour has a very limited amount of land space adjacent to the wharves and all of the wharves are limited in their use due to earthquake damage. The movement of the container terminal will enable other cargos to move onto Cashin Quay, providing much needed capacity for these growing trades.

3.1.1.3 Capacity for larger vessels

In addition to provision of additional freight capacity by creating more land, the reconfigured port must also be designed to handle the increasing vessel sizes. Vessel size has been steadily

increasing across all trades as shipping companies take advantage of the growing freight volumes to create economies of scale in their vessels.

Figure 3.4 graphical demonstrates the growth of container ships over the last 60 years. The largest container ships that currently call at Lyttelton are the Post Panamax vessels with capacity of 4,500 TEUs, and these only began service to New Zealand in 2010. In 2013/14 over 40 of these vessels called at Lyttelton, a strong indication of the rapid trend for larger ships. LPC is proposing to provide infrastructure suitable for Post Panamax plus container ships, and similar deep draft cargo vessels.

TEU: twenty-foot equivalent units,

length x width x depth below water in metres

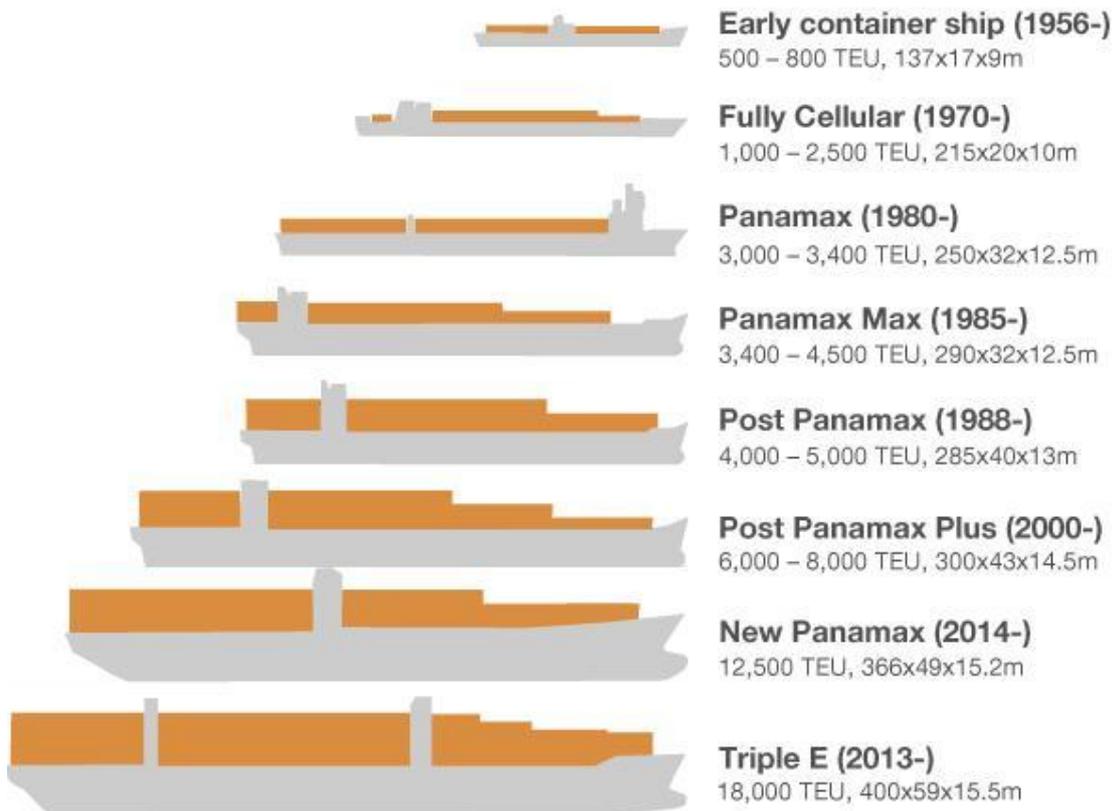


Figure 3.4: Evolution of container ships showing increase in size (www.largestships.com)

In order for Lyttelton Port to become 'big ship capable' it needs to provide three essential components:

- A channel with sufficient depth to allow safe passage to the port for the larger ships which have correspondingly deeper draughts
- Wharfs designed with deeper berths and longer wharf lengths
- Container/freight handling equipment that is sized to handle these larger ships and is able transfer cargo with a high efficiency

The ability to handle these ships is an integral part of the ports recovery and is central to the enhancement of the ports infrastructure. The proposed container terminal on the reclamation is being designed with appropriately sized wharfs and berth pockets for larger ships as well as having capacity to hold the larger cranes needed

It is clearly redundant to build wharf-side infrastructure to handle these bigger ships without a shipping channel with sufficient depth to allow passage of the ships. To facilitate the arrival of these ships the current navigational channel needs deepening, widening and lengthening. LPC has been working for a number of years on a capital dredging project to deliver an enlarged channel. The work has focused on both the design of the channel and studies to understand the effects on the environment. The project is well progressed and a consent application for enlarging the shipping channel should be submitted to the Canterbury Regional Council in early 2015.

Notwithstanding the consent application, the project forms a critical part of the recovery of the port and is integral to the success of the ports rebuild. As discussed in previous sections, without the ability to handle big ships, there is a risk that in the future Canterbury will only be serviced by the smaller, older container ship fleet which are less efficient. This will have a consequential cost for importers and exporters who rely on cost effective freight to get their goods to market.

In summary, increasing the freight handling capacity of the port and providing for larger vessels will deliver the following recovery outcomes:

- Enable the port to have capacity for freight demands at the end of the rebuild (approximately 2026) and predicted future freight demands to 2044.
- Support and enable for economic recovery by providing an efficient and cost effective means for exporters and importers to access domestic and international markets
- Support the communities economic recovery by rebuilding an economically sustainable port with continued employment opportunities
- Providing enhanced and resilient infrastructure which gives local, national and international businesses confidence to invest and do business in Canterbury

In order for LPC to progress the projects that will deliver the increased freight volumes and provide capacity for the changes in shipping trends, the recovery plan needs to deliver the following:

- An expeditious planning framework process which enables a degree of certainty around the ability to reclaim land. This will enable LPC to make critical decisions on how it plans investment to increase container and general freight capacity
- A degree of certainty around the reclamation will also enable LPC to make informed decisions around investment in plant and equipment to cope with the increased freight demands during the rebuild period
- Planning framework support for the need to provide a deeper, wider and longer shipping channel to enable Lyttelton Port to become 'big ship capable'
- Appropriate planning framework controls on construction that recognise the need for the recovery works alongside mitigation of effects

3.1.2 Port to the East – Reconfiguring port operations

As discussed in the previous section, creation of new land at Te Awaparahi Bay is critical to providing the space to handle increased container and general freight volumes. Moving the container terminal off Cashin Quay onto a new reclamation is the key to the reconfiguration of port operations and unlocks the 'Port to the East' project. The movement east of the container terminal means some general cargo operations can move out of the Inner Harbour onto Cashin Quay. This will change the types of trades handled in the Inner Harbour and mean the western Inner Harbour can be re-purposed for recreational use/public access.

The Port to the East will deliver a number of recovery needs for both LPC and the communities of Lyttelton and Christchurch. Each of these is discussed in the following sections.

3.1.2.1 Reducing effects of Inner Harbour Port Operations on Lyttelton Township

Due to general cargo being unable to use Cashin Quay after the earthquakes, all general cargo (aside from coal and vehicles) is currently handled in the Inner Harbour. The close proximity to Lyttelton Township of both the wharves and storage areas creates challenges around managing the dust and noise of these general cargo activities. The principal challenges have been managing dust, traffic movements and noise from the log operation, noise from scrap ship loading, dust from dry bulk cargos and noise from general operations. Whilst LPC have, and continue to put measures in place to improve the management, the best mitigation is to locate some of these cargos further from the township.

The Port to the East project provides an opportunity to do this. It also means that these cargos can be located on more modern facilities with better environmental protection systems (i.e. stormwater treatment), reducing the effects on the harbour water quality. Whilst some of the more compatible cargos like cement, fishing and break bulk will remain in the eastern Inner Harbour, the change in focus will reduce the effects and support the social, economic and environmental well-being of the Lyttelton community.

Conversely without the migration of the container terminal to newly reclaimed land, all general cargos will have to remain in the Inner Harbour, with increasing pressure as trade volumes grow. While LPC is committed, and able to manage the effects over the short to medium term prior to the planned move, it will become increasingly challenging if the current situation was to become permanent.

The predicated changes in effects as a result of the proposed recovery are discussed in more detail in Section 7 and the appended expert reports.

Whilst the reduction in effects is to provide for the communities social and environmental recovery, LPC needs the recovery plan to deliver the following to enable these changes:

- Certainty about the ability to reclaim land in Te Awaparahi Bay so that planning for the eastward migration of some general cargo can commence. This certainty will allow appropriate decisions to be made around the type, timing and location of investment into facilitate the general cargo trades. This is particularly important for capital investment to provide for the trade growth prior to the reclamation being finished.
- Certainty around the management of construction effects, particularly the management of noise. This is crucial to enable good decision making around the ability to repair or rebuild Inner Harbour wharves and other structures.

3.1.2.2 Community access to waterfront

Historically, Lyttelton Port (like most New Zealand ports at the time) was open to the public and people could walk, fish and drive onto the wharfs. Health and safety concerns gradually reduced access, and in Lyttelton this eventually saw the closure of public access to all wharfs.

Following the 11/09/2001 terrorism attack in America, changes to port security were mandated on all ports that linked to American ports. This necessitated LPC to fence off all operational areas, institute tighter access control with security checks and have regular audits by American officials to confirm compliance with the requirements. Since that time, public have not had access to the majority of the waterfront at the port, the only area outside the secure area is at the existing Dampier Bay marina. This has resulted in a loss of connection between the community, the

waterfront and with the port itself. The community has communicated to LPC a strong desire for that connection to be provided.

Currently the primary constraint to providing public access to the waterfront is that all operation port land must meet the security requirements. There are also health and safety conflicts with public access and port operations. Essentially port operations need to move out of an area for it to become publically accessible. As previously discussed, the port is currently very space constrained and all of the land is needed for operational activities with no opportunity to retire any area for public access.

The Port to the East concept of building more land at Te Awaparahi Bay and migrating port operations to the east will mean that some of the current operational land will be able to be freed up from being required for core operations. This will provide an opportunity to move security fences and open up currently closed off areas for public access. When this happens the community will have far better access to the Inner Harbour waterfront and be better connected to the port.

Initially the effort will focus on upgrading the existing public access areas adjacent to the current Dampier Bay Marina (phase 1) and is expected to occur in 2016/17. Phase 2, the next eastward block will be completed in 2017/2018 subject to certainty about gaining consent for the reclamation. As the remainder of Dampier Bay is progressively retired from operational use, Phase 3 and 4 will occur which will unlock direct access from Norwich Quay. Phases 3 and 4 will depend upon the progress of the reclamation and the movement of the container terminal east. Figure 3.5 sets out the four phases in Dampier Bay. As the movement east progresses, there is possibility, in the long term, for further eastward development and additional marina facilities in the area currently occupied by jetties 4,5 and 6. The Dampier Bay Development is wholly dependent on the ability of the Port to move east.

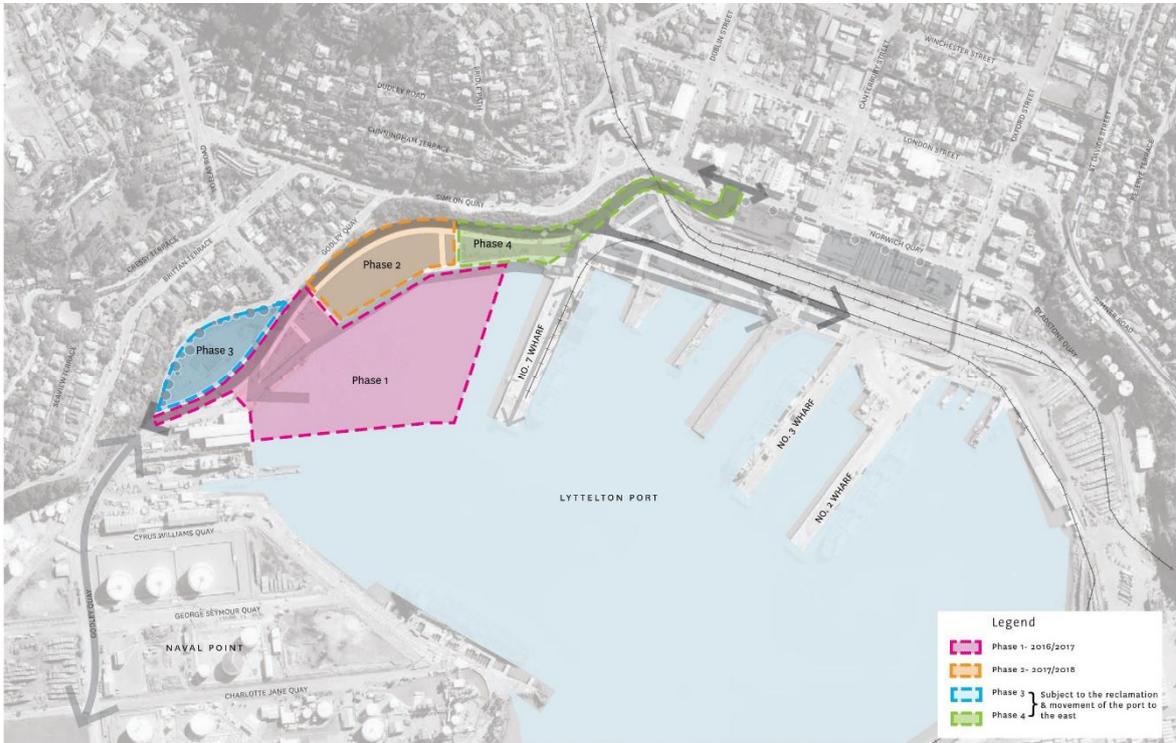


Figure 3.5: Phasing diagram for Dampier Bay development

While the project will be physically delivered in stages, in order for the Dampier Bay development to be a success, holistic planning of the whole development is needed from the outset. This will

enable the transport connections to be designed for the entire development, mean appropriate urban design principals can be incorporated and overall avoid a piecemeal outcome. The ability to plan the whole development is dependent on certainty on Phase 3 and 4 being achievable, particularly phase 3 which has the crucial access to Norwich Quay. This certainty is wholly dependent on the success of the Port to the East project and the subsequent release of currently operational land in Dampier Bay to the public.

The recovery needs associated with the Dampier Bay development are related to the Port to the East project, land use controls, the built environment, access and provision of marina facilities, specifically:

- For Dampier Bay to be successfully and fully implemented, certainty around the Port to the East project and in particular the availability of the 37ha reclamation is needed. This will allow LPC to have confidence that all four phases of Dampier Bay can be developed and enable co-ordinated planning of land use, access and connectivity.
- Dampier Bay needs to be commercially viable to proceed and an appropriate planning framework is needed to assist in this. Appropriate planning provisions to achieve the outcomes the community and LPC are looking for are expected. Overly restrictive planning provisions will put the viability of the development, and the consequential community benefits at risk.
- The commercial viability of the development does depend on the key activity of the marina proceeding. Appropriate planning provisions to enable the construction and operation of the marina (including occupation of the coastal marine area) are needed to provide certainty for the landside portion of Dampier Bay.
- The success of Dampier Bay relies on the provision of good transportation connections, including walking and cycling routes to Lyttelton, road access and public transport connections. The recovery plan needs to provide for these connections in an enabling way which provides certainty, particularly where multiple agencies are involved in the decision making for asset upgrades or implementation.
- The ferry relocation will only occur once access to Norwich Quay, via Sutton Quay (or adjacent to) is available.

3.1.2.3 Larger modern marina facilities

There is quite some history and emotion associated with the provision of marina facilities in Lyttelton, but fundamentally there is very strong desire for a larger, safe, modern floating marina to be built. This has been a particularly pressing issue since the disastrous events of 2001 when a southerly storm destroyed the newly built marina in Magazine Bay. Successive councils, private developers and yacht clubs have all tried to solve the issue but all have been unsuccessful to date. One of the principle stumbling blocks has been the high cost associated with a breakwater to protect the boats from the very conditions that destroyed the last marina.

Currently yachts and launches are either moored in the small pile marina in the Inner Harbour (LPC owned), the pile moorings at Magazine bay or Diamond harbour (CCC owned) or a swing mooring in various bays of Lyttelton Harbour. This arrangement is increasingly placing constraints on the community's ability to participate in boating activities and other marine recreation. Recently, and particularly post-earthquake, insurance companies have been cancelling insurance policies for boats stored on swing moorings or on piles marinas outside the protected Inner Harbour, providing further challenges to participation in marine recreation.

What is proposed by LPC, is a larger modern walk on floating marina which is protected from the southerly storms. LPC is proposing a marina at Dampier Bay with capacity for 150-200 boats with a mixture of berth sizes to suit a range of vessels. The marina will be of a modern floating type

with power and water to the berth. Being a floating marina it will provide for much easier access for people with limited mobility and include disabled access provisions, further enable participation in marine activities. A future stage, the Dampier Bay extension, is also planned with a further 400 berths a possibility.

The recovery needs associated with the marina are predominantly the communities need to regain participation in sporting and recreations. To enable LPC to provide this facility there are a number of aspects that the recovery plan needs to deliver. These are as follows:

- Appropriate rules in the coastal plan to enable the existing marina to be removed and a new marina to be established, this includes provision of occupation for the footprint of the proposed marina.
- Planning certainty associated with the landside which is needed to support the marina. An appropriate rule package for the Dampier Bay landside development to ensure the services and facilities required are enabled.
- For realisation of the Dampier Bay development, port operations need to migrate out of the western Inner Harbour which is wholly dependent on the ability to reclaim land in Te Awaparahi Bay. Certainty around this will allow for better more comprehensive development planning to progress for the second stage.

3.1.3 Better, more resilient port infrastructure

The existing port infrastructure was designed and constructed over a long period starting in the late 1800's. Knowledge of seismicity and design methods to create resilient infrastructure have changed significantly over that time. Consequently the seismic resilience of the infrastructure at the port varies and this was made abundantly apparent in the recent earthquakes. It is critically important that the recovery of the port results in more resilient infrastructure. This is particularly essential as the port forms a critical part of the national infrastructure network and is expected to be serviceable and support civil defence operation following disasters.

Like the knowledge about seismic design, understanding of environmental effects of port operations has advanced significantly since the majority of the port was built. The community and LPC's value the harbour environment, both water, air and land has also increased and higher standards are expected. The recovery of the port provides a unique opportunity to incorporate environmental protection features into the design and construction of new infrastructure. It is expected that this will be a combination of pollution prevention/treatment devices (e.g. storm water treatment systems) and fit for purpose design which allow for better environmental management (e.g. sealed log yards which allow for good debris management to manage dust and debris tracking offsite).

In addition to building back with better seismic resilience and environmental management, the recovery of the port needs to deliver infrastructure which is purpose built to meet the needs of the port users and improves freight handling efficiencies. A more efficient port will have lower handling costs, reduce vessel berthing times and potentially attract a wider range of freight services. This has the potential to increase the economic resilience of the port as well as the importer and export business who rely on an efficient port and a choice of freight services to manage their freight costs.

In terms of the national economy, New Zealand needs a major resilient port in the South Island. It makes sense, given the proximity to the largest city and the productive rural hinterland of Canterbury, that Lyttelton serves this purpose.

In order to provide the improved infrastructure via the ports rebuild, the recovery plan needs provide support and enablement of the following:

- Appropriate rules in the coastal plan which allow for the rebuild of existing assets in a way which provides seismic resilient infrastructure, efficient operations and good environmental management. This needs to anticipate that the structures may be different in shape, size and form and that significant construction work is required.
- Appropriate rules in the coastal plan which recognises the need for enhancement and reconfiguration of port facilities and provides for construction of new infrastructure
- Appropriate and achievable water and air quality standards which recognise the need for recovery but also encourages the improvement in discharge quality
- Appropriate rules in the district plans which recognise the need for the recovery construction and provide for appropriate management of construction effects (particularly noise).
- Certainty of planning outcomes to allow good decisions to be made around the significant capital investment needed to rebuild and enhance the ports infrastructure.

3.1.4 A timely and expeditious rebuild

The recovery of the port, and its resulting support of the recovery of wider Canterbury, is strongly dependent upon the timeliness of the repair, rebuild and enhancement of the port's infrastructure.

The current situation is that nearly four years after the earthquakes the Port is worse off than it was prior to the earthquakes as it has damaged assets and only limited incremental improvements have been able to be undertaken to deal with short-term demand. Whilst some repair of damaged assets has begun, in terms of planning, consenting and construction LPC is now a number of years behind where it needed to be to meet projected growth had the earthquakes not occurred.

The longer the rebuild takes, the longer the port will have to work with the existing damaged infrastructure. This places significant pressure on the few remaining functional structures, the staff working on them and the ability of the Port to be flexible and adapt to the needs of its customers. These challenges only increase with growing freight volumes and the longer the rebuild takes, the greater these challenges will become. This will directly affect the safe and efficient handling of freight and will impact on costs for LPC, the shipping companies and importer/exports.

As the freight volumes increase, so does the need for land to unload, stage and store the freight. This is a significant challenge as the port is already very space constrained. On top of this is the need for space to enable the rebuild of the existing assets as well as the enhancement projects. As an example, the CQ wharf rebuild removed 10% of the capacity of the container terminal and is using more than a hectare of other port land. The difficulties of providing space for the construction projects and freight will become increasingly challenging as time progresses and the freight volumes grow. A timely rebuild will mean the construction occurs before the freight demands increase significantly, it will also mean that new land will be available sooner (via reclamation) which will further decrease pressure on land availability.

Much of the community benefits are realised in the middle to later parts of the program because they are dependent on the availability of reclaimed land to free up operational land in Dampier Bay. A shorter rebuild period will allow those projects to be realised earlier with the consequential benefits to the community brought forward. Conversely, many of the adverse effects of the rebuild program on the community will be construction effects such as noise, dust etc. A more expeditious rebuild of the port will shorten the period of the nuisance effects on the community and bring forward the completion of the earthquake recovery for Lyttelton.

Under business as usual processes, the process of gaining resource consents will create a significant delay in the recovery. The primary reason for this is that the existing planning framework (RMA, regional and district plans) are not adequately equipped to appropriately address these recovery needs in a timely, certain and comprehensive manner. As a result the following challenges and subsequent time delays would result from progressing the recovery through the existing regulatory framework:

- The existing regional and district plans only contemplate the ongoing maintenance of the port and its existing structures, not the rebuild of an entire port. The rules, policy and objective within those plans are not framed around the need for the port to rebuild and as such create unintentional barriers to the rebuild, particularly related to activity status of the required consents. These barriers will result in a large number of consents needed with many publically notified.
- The complexity of the interdependent nature of the recovery projects makes it extremely challenging to provide a complete application under the RMA for all projects together. This would result in approximately 100 individual consent applications made throughout the recovery period. Substantial time demands would be placed on the resources of all parties involved (Council, LPC and the community) and would result in long periods of concurrent public consultation on the rebuild. Significant delays to the recovery would result.
- The existing regulatory environment does not recognise the needs of a post disaster recovery. As a consequence, the effects of that recovery cannot be easily considered against the recovery needs. Due to this, the consideration of the required consents would not explicitly take into account the critical needs for recovery, both in scope and timeliness.

In order for port recovery to meet the needs of the community, the wider Canterbury economy and the port itself, the recovery plan needs to provide the following outcomes:

- A regulatory framework that recognises, and incorporates, the need for recovery in the rules, policies and objective of the relevant planning documents.
- A regional and district plan that anticipates and provides for the recovery of the port, including rebuild, repair and enhancement projects. The plans need to include provisions that provide a timely and certain consenting pathway whilst adequately managing effects.
- Recognition of the extensive consultation and public input that the recovery plan process involves and sets requirements for further public participation appropriately.

3.2 Whole of project risks

There are five whole-of-project risks identified at this stage in the process. Should any one or more of the issues raised below eventuate or fail to be resolved then there is a potential for the operation or recovery of the port to be compromised. The risk areas are briefly set out below:

- **Re-opening of Sumner Road.**
Prior to the earthquake sequence Sumner Road was the primary route for over-dimension and hazardous cargo and an important secondary route for the port generally. The ongoing closure of this route and almost complete reliance on the tunnel has created an on-going risk to the Port's resilience.
- **Access to rock hard-fill material**
There is currently no access to LPC's quarry at Gollans Bay due to the rock-fall hazard posed by bluffs above Sumner Road. The continued presence of this hazard prevents extraction of rock and hard-fill from the quarry. This removes a key raw material supply for the reclamation and the rock armouring of damaged seawalls which will form a significant

component of the repair and rebuild of all wharf structures. While alternative sources are available, and do not substantively affect the viability of the project, the related construction effects, and in particular increased heavy traffic volumes on Norwich Quay, are a risk and the costs to obtain an alternative source could be substantial.

- Ability to reclaim land

As the entire recovery of the port is dependent on additional land created by reclamation in Te Awaparahi Bay to provide a new container terminal, the ability to gain authorisation to reclaim the land is essential.

- Concurrent Christchurch City Replacement Plan Process

The process to replace the Christchurch City Plan (including the Banks Peninsula section) is underway. Although many of the provisions in the LPRP are a carry-over from the Banks Peninsula section, there are a number of rules that need amending to assist in recovery, including provisions relating to Dampier Bay, changes to the management of construction noise, amendments to the height provisions, and changes to the provisions on quarrying and associated earthworks. There is a risk of considerable confusion if the Christchurch City Replacement Plan pursues amendments to the Banks Peninsula section that is being addressed in the LPRP. It will result in confusion for the community, potentially inconsistent outcomes with assessment processes being carried out under different statutes (the RMA for the Replacement Plan and the CER Act for the LPRP) and ultimately the needs of recovery being compromised.

- Efficient transport network

The ongoing efficiency of the supporting transport network, particularly the main arterial freight routes (road and rail) is critical to the success of the Port's recovery. It is essential that these networks are developed to accommodate growth in the region's transportation requirements. Failure to keep pace with this growth will threaten the recovery of both the port and the entire region.

4 Consultation

4.1 Consultation Strategy

In accordance with clause 6.4 of the Minister's Direction, LPC has prepared a consultation strategy. As required by the Direction, the Strategy was prepared with advice from Canterbury Regional Council, Christchurch City Council, Department of Conservation, Te Rūnunga o Ngāi Tahu and New Zealand Transport Agency.

4.2 Consultation streams

Clause 6.2 of the Minister's Direction required LPC to undertake appropriate consultation with relevant communities and interested persons to inform and seek feedback on its proposals, including but not limited to LPC's long-term vision for the efficient, timely and effective repair, rebuild and restoration and enhancement of Lyttelton Port.

Following the Minister's Direction, the Port Lyttelton Plan (PLP) was released in June 2014 and informed the basis of LPC's consultation, setting out LPC's vision for the future repair and enhancement of the Port. Concurrently, the Port Lyttelton Plan website was established and the public drop-in centre 'Port Talk' set up on London Street.

The PLP was distributed to all identified stakeholders, was available online, and copies were also distributed at meetings, briefings and at the Port Talk centre.

Feedback was sought, with hard copy submissions could follow any response structure, and online respondents were asked five open-ended questions, and one free response question:

- Import and export volumes are set to double within the decade and again by 2044. Freight volumes are expected to increase by 400% by 2044. How do you think we should rebuild and reconfigure the port to meet this demand?
- How do we best open up opportunities for the community to access the waterfront, to the township and even up to sections of the Port Hills?
- What activities would you and future generations want to see along the waterfront at Dampier Bay?
- What is important about Lyttelton Harbour to you?
- What do you think about the range of effects/impacts we are assessing?
- The Port Lyttelton Plan is a big undertaking, we are keen to hear your views on any aspect that concerns you, excites you or that you think we should be aware of?

These mediums were the primary means by which to clearly communicate LPC's plans. A large emphasis was placed on visually conveying the plan and the changes that would occur if it was to proceed. Comparative maps were included on both the website, in Port Talk and in the Port Lyttelton Plan booklet.

4.2.1 Community and stakeholder submissions

As discussed out above, feedback on the PLP was gathered through a number of engagement streams, with community members and stakeholders encouraged to submit feedback online, in writing, or in person at the Port Talk centre.

Over 500 stakeholders were sent information and/or provided with briefings with a request to provide feedback. In addition, employees of LPC (over 500 individuals) were provided with the PLP and requested to provide feedback. Additional requests for feedback were conveyed through

advertising in The Press and Bay Harbour News, social media, and other media outlets such as business and sector specific media.

As at Friday 19 September, 211 submissions had been received through these media. 24% of these were from Lyttelton and 11% were from Diamond Harbour.

4.2.2 Target stakeholder workshops

In accordance with clause 6.4 of the Direction, LPC ran a number of stakeholder workshops. 167 stakeholders were invited to attend a series of seven facilitated stakeholder workshops, and more than 70 people attended these workshops. Workshop participants submitted written feedback under the same divisions as the PLP (Thriving Port, Connecting with the Community, Healthy Harbour). There were four additional theme areas that were included in individual workshops depending on the extent of interest. These were Transport; Science; Health effects and other effects and issues.

4.2.3 Subject matter expert external engagement

There are a number of subject matter experts who are assisting with provided technical and subject matter expertise from their respective sectors. These individuals have a number of different sector perspectives, including recreation, tourism, economic, social, cultural and iwi, transport, and health and well-being. During their involvement with this stage of the project, these experts have had contact with additional external stakeholders as they have carried out consultation within their own sectors. The outcomes of this consultation are discussed in the Consultation Report and in the relevant technical reports contained in the appendices to this cover report.

4.3 Parties consulted with

The parties consulted with are discussed at length in the consultation report contained in Appendix 3. In particular it is noted that in the report:

- Table 2 contains a stakeholder list which LPC consulted with and the report provides a summary of consultation activity by stakeholder group;
- a detailed schedule of parties consulted with is provided;
- a list of submissions received is provided, recording the parties who, following consultation, chose to provide feedback.

4.4 Consultation with Te Rūnanga o Ngāi Tahu

Consultation with Te Rūnanga o Ngāi Tahu occurred predominantly in two streams:

- Consultation with Te Rūnanga o Ngāi Tahu, Papatipu Runanga, LPC and ECan in a wider sense as Te Rūnanga o Ngāi Tahu are recognised in clause 6.4 of the Direction as being a party that must be consulted with in an appropriate manner. This consultation has included Te Rūnanga o Ngāi Tahu providing advice and input into LPC's Consultation Strategy, and participating in Statutory Partner coordination and information meetings, and expert conferencing with LPC and ECan.
- Consultation to facilitate the preparation of the Cultural Impact Assessment. The key methods to facilitate the CIA are set out in the table below.

Table 4.1: Key methods used to facilitate the preparation of this CIA

Method	Explanation
Review of information	Relevant information was reviewed, including the Port Lyttelton Plan, earlier CIA and other reports prepared by Rāpaki for LPC, the Whakaraupō Mātaītai application and available technical information.
MAG meetings	MAG meetings provided a regular forum for manawhenua and LPC to discuss key issues and how these may be addressed.
Presentation of the PLP at Rāpaki Marae	LPC presented the Port Lyttelton Plan at Rāpaki Marae on July 21, 2014. The purpose of the Hui was to provide an overview of the Plan, and enable the discussion key areas of interest in a marae based setting. Sixteen people attended this Hui.
Sedimentation Hui	LPC and Te Hapū o Ngāti Wheke organised a Sedimentation Hui in response to manawhenua concerns about the effects of port structures on harbour hydrodynamics and sedimentation in the upper harbour. The Hui was held on July 27 th , 2014, with 27 participants.
CIA Hui	Three Hui were held to work on the CIA (two full day, one half day). These were held on August 7 th , August 29 th and September 15, 2014.
Individual and small group discussions and meetings	All whānau from Rāpaki and Koukourāata were invited to participate in the CIA process. For those unable to attend hui, individual meetings were arranged.
Ongoing dialogue with LPC on key issues	Two meetings were held with LPC and Ngāi Tahu to discuss specific issues and inform the CIA. The first focused on planning issues, and included ECan staff. The second focused on mahinga kai assessment and monitoring expectations and opportunities. In addition, questions and information requirements that arose out of the CIA process were responded to by LPC as they arose.
Preparation of draft CIA	A draft CIA was completed on September 10 th , and provided to Ngāi Tahu for review.
Endorsement of the CIA	The CIA was approved for release on September 15 th , 2014 subject to minor revisions.

4.5 Consultation feedback

The consultation report contains a full discussion of the themes and sub-themes in the consultation feedback. The main themes from this feedback related to Dampier Bay, public access, cruise ships, transport, Port to the east, environmental effects. These themes and sub-themes are discussed in Table 4.2 below.

This feedback was collated and analysed by reviewing the feedback received using a process of open coding and data reduction to develop a set of themes. This thematic structure also went through validity testing. The Consultation Report discusses this process in more detail.

The collated and analysed feedback was fed through to the relevant technical experts to inform their reports.

4.6 How feedback informed technical reports and redevelopment plans

Consultation feedback has informed a number of the inputs into the reports that have been prepared in the material being presented to Environment Canterbury. Table 4.2 below sets out a list of the feedback themes and how LPC has addressed feedback received.

It is also relevant to note that at page 39 of the PLP, LPC set out the range of categories for which LPC had engaged experts to be assessing effects. These topics included noise; air quality; marine ecology; traffic and transport; social and economic well-being; landscape; waves, currents and sediment movement; cultural values; recreation and tourism; contaminated land; water quality; and land based ecology.

The PLP invited feedback from the public on whether they had any additional topics of concern that they would like further information on and LPC to provide a technical report on. As a result of feedback received and submitter concerns, LPC engaged a number of additional technical reports, including reports on lighting, marine spill and mahinga kai.

4.6.1 Recommendations

The Consultation Report provides a number of recommendations. These recommendations have been taken into account as follows:

4.6.1.1 Dampier Bay development

- The Report suggests that planning proceed on a design for the development that accommodates a marina with a combination of floating berths, dry dock and other maritime amenities (located so that overspray and other activities do not affect user enjoyment), and hospitality, heritage, retail and recreation amenities. This is generally consistent with recommendations in the urban design, social and recreation reports and will be matters for LPC to consider at detailed design stage and in accordance with the assessment matters provided for Dampier Bay in the proposed District Plan rules.
- The Report states it is essential that consideration be given to the commercial viability of the development and whether there will be any impact on Lyttelton hospitality and retail providers. The Economic Effects report in Appendix 6 has considered the impact of Dampier Bay on the township, concluding that the extent of commercial opportunities and practical characteristics of Dampier Bay will mean that the overall development is compatible with the economic potential and growth of Lyttelton Town Centre and Lyttelton Township. Commercial viability of Dampier Bay is a matter for LPC to consider.

4.6.1.2 Public access

- The report states pedestrian links between Naval Point, Dampier Bay, Lyttelton and the Port Hills should be established and strengthened, including maximising public access to the waterfront wherever practicable. Concerns about traffic on Norwich Quay also need to be resolved, with the preferred options being a pedestrian over bridge or the diversion of heavy trucks. These issues have been recognised in the Traffic and Urban Design reports, with a number of recommendations proposed which have been incorporated into the Outline Development Plan and accompanying District Plan provisions. It also must be acknowledged that Norwich Quay requires a multi-agency approach.

4.6.1.3 Cruise ships

- The report states there is strong support for provision of a cruise ship berth, and future planning should incorporate a berth capable of accommodating a 350m ship located in

convenient proximity to parking and public transport. A cruise berth remains in LPC's proposed plans, as shown in Appendix 2.

4.6.1.4 Ferry location

- The report notes the strong preference expressed by individual respondents is that the ferry terminal be retained at its current location, while workshop responses preferred a shift to Dampier Bay. If the current site is retained, planning needs to consider how to mitigate restrictions such as access to convenient parking, toilets and a suitable terminal. Priorities for the ferry location include proximity to town, accessibility, heritage and linkages with parking and other forms of transport. While recognising the responses from individuals is to retain the current location (as opposed to workshop responses which supported a move), LPC's plans are to relocate the Diamond Harbour Ferry terminal to a location adjacent to Wharf No.7.

4.7 Conclusion

LPC undertook extensive consultation for this phase to inform the preparation of the Recovery Plan. This consultation took place in a number of forms with a number of different parties. LPC has also undertaken extensive consultation with the statutory partners during this process.

It is considered that all consultation requirements from the Direction have been adequately met.

Finally, the key to effective consultation is not only to talk to individuals and stakeholders, but to use feedback received to inform decisions and work going forward. It should be evident from Table 4.2 below that the feedback received has extensively informed the material being provided to support the preparation of the preliminary draft Recovery Plan. Particular themes of interest to submitters included Dampier Bay and public access around the Port and this feedback has been carefully analysed by LPC and its experts to inform in particular the necessary changes to relevant planning documents.

For a Project of this nature, it is considered the consultation undertaken was effective, adequate and allowed the public and stakeholders to put forward their views in a manner that LPC and its experts were able to use to inform the preparation of the Recovery Plan.

Table 4.2: Consultation themes and how feedback has been addressed by LPC

Theme	Sub-theme	Consultation method	Response	Extent of feedback	What LPC did with the consultation feedback
Dampier Bay	Marina	Individual and stakeholder responses Workshop responses	<ul style="list-style-type: none"> In favour of a marina Suggest a number of features and facilities that this marina could have Submissions recognised the ease of access and tourist value of a floating marina, and the some addressed the value for money and heritage value of pile moorings 	High from all stakeholder groups	<p>This feedback has informed the relevant technical reports (including urban design, landscape, recreation and social).</p> <p>Provision for the marina and Dampier Bay generally can be seen in the Outline Development Plan (<i>ODP</i>). Features and facilities of this marina, and Dampier Bay generally, are a matter for later, detailed design. However LPC has recognised the need for good urban design and provisions of facilities through a District Plan planning framework which:</p> <ul style="list-style-type: none"> contains a detailed policy which anticipates a range of activities and facilities being provided to support the marina, as well as Dampier Bay generally; requires development in general accordance with the ODP (which includes the marina); and provides controlled activity status for Dampier Bay development, including detailed assessment matters for the controlled activity.
	Activities and amenities	Individual and stakeholder responses Workshop responses	<ul style="list-style-type: none"> Submissions suggested a range of maritime activities and amenities, heritage, and other amenities The importance of heritage features being maintained and visible 	High from all stakeholder groups	<p>See above for LPC has responded to this feedback for Dampier Bay.</p> <p>In addition, it is noted that retention of heritage was a topic of interest in consultation, including recommendations that heritage could be shown through a museum which could house the contents of the Lyttelton Museum. The proposed District Plan rules</p>

Theme	Sub-theme	Consultation method	Response	Extent of feedback	What LPC did with the consultation feedback
					have picked up on this, with a proposed permitted activity rule for museums (as well as art galleries and visitor information activities) with the Dampier Bay Area.
	Commercial and safety considerations	Stakeholder responses Workshop responses	<ul style="list-style-type: none"> The balance of commercial considerations so that the development enhances Lyttelton's retail and hospitality resources rather than competes with them The importance of safety considerations for water users and other public users 	Moderate from stakeholder submissions and workshop responses	<p>LPC has provided economic evidence on commercial impacts of Dampier Bay which has concluded the commercial opportunities and practical characteristics of Dampier Bay will mean that the overall development is compatible with the economic potential and growth of Lyttelton Town Centre and Lyttelton township.</p> <p>LPC has also provide a Navigation Safety report which recognises and addresses the importance of safety considerations on the water.</p>
Public Access	Links between areas, public access to the waterfront	Individual and stakeholder responses Workshop responses	<p>Responses recognised the importance of:</p> <ul style="list-style-type: none"> Links between areas Public access to waterfront Safe crossing of Norwich Quay and heavy traffic on Norwich Quay 	<p>Low from individuals for links</p> <p>Moderate from individuals for access and crossing</p> <p>Low for stakeholder submissions and workshop responses</p>	<p>Public access is a key focus in the social, urban design and transport reports.</p> <p>LPC has taken the recommendations from these reports as:</p> <ul style="list-style-type: none"> The proposed Outline Development Plan includes public access to the waterfront and shows key linkages between Dampier Bay back to the town centre and to Naval Point. The proposed District Plan rules requires subdivision and development to be in general accordance with the Outline Development Plan; and public access is recognised through Dampier Bay assessment matters in District Plan rules. The traffic report is consistent with these recommendations and recognises the Norwich Quay response must be a multi-agency response.

Theme	Sub-theme	Consultation method	Response	Extent of feedback	What LPC did with the consultation feedback
Cruise ships	Provision and location of a berth	Individual and stakeholder responses Workshop responses	<ul style="list-style-type: none"> Stakeholders and workshop participants (particularly those from the tourism sector) favoured the provision of a berth. Individual submissions also favoured the provision of a berth, but this was not as much of a focus as for other stakeholders 	High from all stakeholder groups	<p>The establishment of a dedicated cruise berth facility is a priority for the port. It is however noted in Section 10 that given the returns associated with this trade and the high cost of this facility the Port is seeking funding from third parties for approximately half of the estimated \$40M cost of this facility.</p> <p>LPC continues to consider both Inner Harbour and Outer Harbour Cruise ship options and relevant technical reports have assessed these options.</p> <p>LPC also recognises the need to provide a berth up to 350m to account for growth in vessel size (see Section 1.4.8).</p>
Transport	Ferry	Individual and stakeholder responses Workshop responses	<ul style="list-style-type: none"> Common topic of comment for all submission types. Individual and stakeholder submissions were more likely to favour the current site, while workshop responses favoured a move to Dampier Bay. Important considerations for the ferry location were that it is close to the town centre and links to public transport. 	High from all stakeholder groups	<p>LPC acknowledges the strong interest in ferry location. LPC is proposing to relocate the ferry terminal to a location adjacent to Wharf No.7 in the future. The expert reports also recognise the importance of this ferry location and ensuring it is close enough to the town centre and links to public transport (see the recreation, social and transport reports).</p> <p>LPC considers the relocated ferry terminal can provide capacity and enhanced level of amenity and service for users of the ferry service.</p> <p>The need to integrate the terminal with public transport and provide a safe and efficient connection to ferry terminals is also recognised in the proposed District Plan framework (including in the Dampier Bay policy and rule assessment matters).</p>

Theme	Sub-theme	Consultation method	Response	Extent of feedback	What LPC did with the consultation feedback
	Buses	Individual responses	<ul style="list-style-type: none"> • Important that the bus links with the ferry, the town centre and the east side of Lyttelton. • Waiting on Norwich Quay is viewed as dangerous and unappealing. 	<p>Low from individual submissions</p> <p>None from stakeholder submissions or workshop responses</p>	<p>The social and transport reports have considered these issues. In implementing Dampier Bay development, LPC will work with CRC and CCC to ensure a high quality public transport interchange facility is provided for passengers interchanging between ferry, bus services and the town centre.</p> <p>The need for quality public transport connections is also recognised in the proposed District Plan framework (including in the Dampier Bay policy and rule assessment matters).</p>
	Car parking	Individual responses	<ul style="list-style-type: none"> • Important that sufficient parking is developed to support the Dampier Bay development. 	<p>Low from individual submissions</p> <p>None from stakeholder submissions or workshop responses</p>	<p>The urban design, transport and social reports have considered the need for sufficient car parking.</p> <p>This issue is also recognised in the proposed District Plan framework (including in the Dampier Bay policy and rule assessment matters).</p>
	Sumner Road	Individual and stakeholder responses	<ul style="list-style-type: none"> • Both individuals and stakeholders favour the re-opening of the road. 	<p>Low from all stakeholder groups</p>	<p>While LPC recognises the importance of reopening Sumner Road, including to provide additional resilience to the Port by allowing heavy vehicles carrying oversized and hazardous loads, clause 5.5 of the Direction explicitly excludes LPC from suggesting any changes to the relevant planning documents to enable the reopening of this Road.</p>

Theme	Sub-theme	Consultation method	Response	Extent of feedback	What LPC did with the consultation feedback
	Rail	Individual responses	<ul style="list-style-type: none"> Suggest using the rail tunnel for freight, and potentially for road freight also. A small number of submissions suggested passenger rail. A very small number of workshop responses suggest using the rail tunnel for freight 	Low from all stakeholder groups	The use of rail has been considered in the transport report, with traffic modelling undertaken assuming use of rail for port freight will increase over time from 20% currently, to 30% in 2026 and 40% in 2041. Sensitivity testing was also undertaken assuming no increase from 20%. It is therefore considered the use of rail (including increasing use) has been adequately considered by LPC.
Port to the east	Reclamation	Individual responses	<ul style="list-style-type: none"> Half the submissions addressing this theme were in favour, a quarter opposed it, and a quarter had queries about the extent of the reclamation and potential environmental effects. 	<p>High from individual submissions</p> <p>Low from stakeholder submissions and workshop responses</p>	<p>The potential effects of the reclamation have been addressed in a number of reports. The reclamation will occur in an already highly modified part of the coastal environment, being located adjacent to the existing coal stockyard. The conclusions of the baseline assessments (see Section 7) is that reclamation in principle can be constructed at this location but a controlled activity consenting process is required to address designs details, construction techniques, the management of sediment plumes; and the mitigation or enhancement of kaimoana.</p> <p>Section 3 of this report details why the reclamation is critical to recovery.</p>
	Movement to the east	Individual responses	<ul style="list-style-type: none"> Supported the proposal. 	<p>High from individual submissions</p> <p>None from stakeholder submissions or</p>	The movement east is the key driver of the recovery project. Without certainty that LPC can undertake the reclamation and move operations eastward, LPC does not have the necessary certainty to begin the Dampier Bay development. For this reason, it is critical the reclamation is included with the Recovery Plan.

Theme	Sub-theme	Consultation method	Response	Extent of feedback	What LPC did with the consultation feedback
				workshop responses	
Environmental effects	Ecology	Individual and stakeholder responses Workshop responses	<ul style="list-style-type: none"> Importance of marine or terrestrial wildlife 	<p>Moderate from individual submissions</p> <p>Low from stakeholder submissions or workshop responses</p>	<p>LPC has engaged a marine mammals report and a terrestrial ecology report to address concerns raised.</p> <p>Terrestrial ecology effects relate to the Haul Road and quarrying activities, with these works not differing significantly from those already consented. However an assessment matter is proposed to be added to the District Plan controlled activity rule to manage effects on terrestrial ecology.</p> <p>A number of mitigation measures have been proposed in the marine mammals report, in particular, to address potential effects on Hector's dolphin from the piling operation. These will be considered by LPC as part of recovery works.</p>
	Water quality	Individual and stakeholder responses Workshop responses	<ul style="list-style-type: none"> Importance of clean water and good water quality 	<p>High from individual submissions</p> <p>Low from stakeholder submissions or workshop responses</p>	<p>LPC recognises the need for good water quality, however the state of the existing environment (and reflection this is a working port area) must also be taken into account.</p> <p>The marine ecology and stormwater reports consider the importance of good water quality.</p> <p>It is unlikely that there would be any contamination issues associated with the construction of the reclamation. The effects of the other construction works associated with Port Recovery are unlikely to cause any significant impacts.</p> <p>Amendments are however sought to the Regional Coastal Environment Plan and Proposed Canterbury</p>

Theme	Sub-theme	Consultation method	Response	Extent of feedback	What LPC did with the consultation feedback
					<p>Land and Water Regional Plan in relation to discharges generally in the coastal marine area and stormwater discharges are considered appropriate to manage effects and provide for recovery.</p> <p>Also, following feedback received through consultation, LPC engaged a marine spill expert to prepare a report on risk associated.</p>
	Dredging	<p>Individual and stakeholder responses</p> <p>Workshop responses</p>	<ul style="list-style-type: none"> Responses suggested a desire for more knowledge, no consistent pattern of support or opposition to the proposal 	Low from all stakeholder groups	<p>Several technical reports address the effects of dredging, in particular, the report relating to Sedimentation and Turbidity. LPC recognises sediment movement is also a critical issue raised in the Cultural Impact Assessment and shares the views in this report that ongoing work is required to determine and validate effects.</p> <p>Various changes are also sought to the Regional Environmental Coastal Plan in relation to dredging which are considered appropriate to manage effects and provide for recovery.</p> <p>A separate resource consent application is also being sought for the capital dredge project to enable the port to receive 'bigger ships'. Becoming bigger ship capable is a critical element in recovery</p>
	Tank farm	Individual responses	<ul style="list-style-type: none"> Believed to be visually unappealing. 	<p>Low from individual submissions</p> <p>None from stakeholder submissions or</p>	The tank farm is an existing activity at the Port. It is not considered appropriate to impose landscape or urban design controls on this operational area. LPC has requested the rollover of the existing height rules for the tank farm.

Theme	Sub-theme	Consultation method	Response	Extent of feedback	What LPC did with the consultation feedback
				workshop responses	
	Air quality	Individual and stakeholder responses Workshop responses	<ul style="list-style-type: none"> Generally in relation to traffic fumes on Norwich Quay and dust from logs, coal and construction. 	Low from all stakeholder groups	An air quality report has been produced. LPC has also prepared a Construction Environmental Management Plan (CEMP) for the Port Recovery and this includes a dust management technical chapter that outlines the controls that will be put in place to manage dust. The CEMP states that all construction activities should be operated, maintained, supervised, monitored and controlled at all times, so that all dust emissions are maintained at the minimum practicable level. A new controlled activity rule in the NRRP has been proposed that manages the extraction, processing, handling or storage of materials associated with various repair and construction activities.
	Noise	Individual and stakeholder responses Workshop responses	<ul style="list-style-type: none"> No consistent pattern of whether noise levels were acceptable or unacceptable 	Low from all stakeholder groups	LPC recognises the potential impact of construction noise in particular of recovery activities. LPC's experts have undertaken extensive investigations and have recommended a rule package to address these potential effects which is considered appropriate to manage effects and provide for recovery.
	Lighting	Individual and stakeholder responses Workshop responses	<ul style="list-style-type: none"> Lighting can have health effects on humans and fauna Solutions include directing light downwards and using side shielding 	Low from all stakeholder groups	Following feedback, LPC commissioned a lighting report. LPC has also requested the rollover of existing District Plan framework for lighting.

5 Cultural Impact Assessment

5.1 Background

Under clause 6.5.4 of the Minister's Direction, LPC were directed to provide a Cultural Impact Assessment (CIA) to enable the preparation of the preliminary draft Lyttelton Port Recovery Plan. In addition, the Minister's Direction stipulates that a number of matters must be addressed in the Recovery Plan, including the social, economic, cultural and environmental well-being of communities (clause 5.1.2), and the needs of users of the harbour, including iwi (clause 5.1.4). These matters are addressed in the CIA.

It is important to understand the CIA has the status of a working document that provides a basis for ongoing work with LPC and ECan. The CIA flags key issues and provides direction to address those issues, but recognises that some content may change once further technical information becomes available. It is recognised in the CIA that the level and detail of information required to prepare a comprehensive assessment of potential effects on Ngāi Tahu values was not available given the timeframes imposed by the Direction.

The CIA is a report from the collective of Te Hapū o Ngāti Wheke (Rāpaki), Te Rūnanga o Koukourārata and Te Rūnanga o Ngāi Tahu. The CIA recognises that Te Hapū o Ngāti Wheke is the Papatipu Rūnanga representing the hapū Ngāti Wheke, who hold mana whenua and mana moana (traditional authority) over Whakaraupō and its catchment. The takiwā of Te Hapū o Ngāti Wheke is defined in the Te Rūnanga o Ngāi Tahu (Declaration of Membership Order) 2001 and the Port Cooper Deed as centring on Rāpaki and including the catchment of Whakaraupō and Te Kaituna.

Te Rūnanga o Koukourārata has an interest in the Lyttelton Port Recovery Plan with regard to the potential effects of port recovery and development on Koukourārata and the values associated with that harbour. Te Rūnanga o Koukourārata is the Papatipu Rūnanga representing the hapū Ngāti Huikai. The takiwā of Te Rūnanga o Koukourārata centres on Koukourārata and extends from Pōhatu pā to the shores of Te Waihora, including Te Kaituna.

Te Rūnanga o Ngāi Tahu is the legal representative of Ngāi Tahu Whānui within the Ngāi Tahu takiwā, as per section 15 of the Te Rūnanga o Ngāi Tahu Act (TRoNT) Act 1996. The TRoNT Act and the Ngāi Tahu Claims Settlement Act (NTCSA) 1998 give recognition to the status of Papatipu Rūnanga as kaitiaki, manawhenua and rangatira of the natural resources within their takiwā boundaries. Notwithstanding the relevant provisions of the Te Rūnanga o Ngāi Tahu Act 1996, it is established practice for resource management matters that the kaitiaki status of the Papatipu Rūnanga is supported and enabled by Te Rūnanga o Ngāi Tahu.

5.2 Preparation

The CIA was prepared using a facilitated participatory process involving Te Hapū o Ngāti Wheke, Te Rūnanga o Koukourārata and Te Rūnanga o Ngāi Tahu, and using a range of methods as set out in the Table below.

Table 5.1: CIA methods

Method	Explanation
Review of information	Relevant information was reviewed, including the Port Lyttelton Plan, earlier CIA and other reports prepared by Rāpaki for LPC, the Whakaraupō Mātaitai application and available technical information.
Manawhenua Advisory Group (MAG) meetings	MAG meetings provided a regular forum for manawhenua and LPC to discuss key issues and how these may be addressed.
Presentation of the PLP at Rapaki Marae	LPC presented the Port Lyttelton Plan at Rāpaki Marae on July 21, 2014. The purpose of the Hui was to provide an overview of the Plan, and enable the discussion key areas of interest in a marae based setting. Sixteen people attended this Hui.
Sedimentation Hui	LPC and Te Hapū o Ngāti Wheke organised a Sedimentation Hui in response to manawhenua concerns about the effects of port structures on harbour hydrodynamics and sedimentation in the upper harbour. The Hui was held on July 27th, 2014, with 27 participants.
CIA Hui	Three Hui were held to work on the CIA (two full day, one half day). These were held on August 7th, August 29th and September 15, 2014.
Individual and small group discussions and meetings	All whānau from Rāpaki and Koukourāata were invited to participate in the CIA process. For those unable to attend hui, individual meetings were arranged.
Ongoing dialogue with LPC on key issues	Two meetings were held with LPC and Ngāi Tahu to discuss specific issues and inform the CIA. The first focused on planning issues, and included ECan staff. The second focused on mahinga kai assessment and monitoring expectations and opportunities. In addition, questions and information requirements that arose out of the CIA process were responded to by LPC as they arose.
Preparation of draft CIA	A draft CIA was completed on September 10th, and provided to Ngāi Tahu for review.
Endorsement of the CIA	The CIA was approved for release on September 15th, 2014 subject to minor revisions.

5.3 Key issues

Key values, interests and associations that have been identified in the CIA include:

1. Whakaraupō as a cultural landscape with a long and rich history of Ngāi Tahu land use and occupancy, and strong tradition of mahinga kai. Ngāi Tahu have lived and fished in this harbour for generations. The cultural, spiritual, historical and traditional importance of Whakaraupō is confirmed in the Statutory Acknowledgement provisions of the Ngāi Tahu Claims Settlement Act (NTCSA) 1998 (Schedule 101).
2. Ngāti Wheke have a long term vision for Whakaraupō which reflects the importance of the harbour as mahinga kai. It is Ngāti Wheke's intention to restore and manage the harbour

as a customary fishery and community food basket, in order to fulfil the following long term vision:

The restoration of the cultural health of Whakaraupō, including harbour water quality, to support mahinga kai abundance and diversity at levels where it can sustain customary use mō tātou, ā, mō kā uri ā muri ake nei.

3. Ngāi Tahu use of Whakaraupō also includes waka, including waka ama (outrigger canoes), waka taua (traditional canoes), and waka unua (sailing canoes). Ngāi Tahu have used waka on Whakaraupō for generations, for mahinga kai, travel and trade. The continued use of harbour for traditional waka purposes is an important value, as well as more contemporary recreational use, including competitive waka ama racing and training.
4. While the primary focus of the CIA is Whakaraupō, values associated with Koukourārata are also discussed. Koukourārata has an equally long history of Ngāi Tahu settlement. As with Whakaraupō, Te Ara Whānui o Makawhiua (Koukourārata) was historically a major mahinga kai area because of the availability of natural resources within the harbour. The significance of the harbour as a mahinga kai has not diminished over time.

5.4 Implications of the Recovery Plan

Manawhenua support the need for the port to recover, grow and develop as a thriving port. However the CIA makes it clear that aligning the long term vision of the Port with manawhenua aspirations for Whakaraupō is fundamental to enabling port recovery in a manner than reflects the value of the harbour as both a mahinga kai and a port.

The CIA identifies the potential effects on Ngāi Tahu values and interests as a result of the proposed Recovery Plan for Lyttelton Port. The key messages from the CIA of the implications of the Recovery Plan are as follows.

5.4.1 Opportunities for positive effects

The long term vision of the port as expressed in the Port Lyttelton Plan presents a number of opportunities for positive effects on harbour health and associated cultural values. This includes:

- Improving environmental performance in the design of the rebuild and upgrade of existing damaged infrastructure, including through the use of modern technology and infrastructure. Improving environmental performance should provide benefit to harbour health, particularly coastal water quality.
- Enabling a long term holistic approach to recovery, as opposed to a 'consent by consent' approach. This will allow a robust and complete assessment of effects, particularly of cumulative effects.
- Recognising the relationship of Ngāti Wheke with Whakaraupō, particularly in the Inner Harbour.

5.4.2 Potential adverse effects

The CIA identifies potential risks to harbour health and Ngāi Tahu values, including:

- Proposed reclamation in Te Awaparahi Bay is critical to the 'Port to the East' concept. The reclamation is also the key issue for Ngāi Tahu with the Recovery Plan:
 - A concern is raised about the ability to control adverse effects on harbour health and mahinga kai values through the Recovery Plan process.
 - Direct loss of coastal space and therefore mahinga kai habitat values in Te Awaparahi Bay.

- Potential effects on mahinga kai species as a result of changes to tidal currents and waves, and therefore nutrient transport and turbidity.
- Potential indirect effects on mahinga kai species as a result of changes to tidal currents and wave energy and how this may influence sediment retention in upper harbour habitat areas.
- Visual effects on the harbour landscape as a result of the loss of coastal space and increased industrialisation of the area.
- Location of the bulk fuel berth. In particular, an outer harbour berth would reduce the ability to contain a fuel/oil spill, and an unconfined spill would affect coastal water quality and mahinga kai. Marine spill risk has been addressed in a report appended in Appendix 21.
- Managing construction effects, including effects on harbour water quality, archaeological values, fisheries, marine mammals and other values if not managed appropriately. Various technical assessments have assessed construction effects. LPC has also drafted a Construction Environmental Management Plan. Overall, Ngāti Wheke is comfortable with the CEMP and how cultural issues are addressed.
- Increased traffic associated with port growth may have effects on existing infrastructure and the community. The effects of this are addressed in the traffic assessment in Appendix 12.
- Biosecurity risks as larger ships with higher volumes of ballast, and a new container terminal exposed to the outer harbour may increase the risk of non-indigenous marine organisms entering the harbour. Marine pests have the potential for significant effects on harbour health and mahinga kai. Biosecurity risks have been addressed in the biosecurity assessment contained in Appendix 18.
- Cruise ship berth options, as removal of the Eastern Mole may reduce the ability to contain inner harbour contaminations such as a fuel spill. If a new wharf is required for an outer harbour option, this new coastal structure has the potential influence hydrodynamics. The implications for hydrodynamics have been discussed in the Waves and Tidal Currents report contained in Appendix 13.
- Consistency of the new port layout with Mātaimai provisions.

The assessment of effects in Section 7 assesses these potential effects, including recommendations for the Recovery Plan from the report authors.

Overall it is acknowledged that protecting Ngāi Tahu values requires a whole harbour integrated management approach. In particular, the CIA provides that with the reclamation especially there is a need to:

- Balance LPC's requirements with the value of the harbour as a Ngāi Tahu cultural landscape and mahinga kai; and
- Provide both parties with the certainty required to achieve their respective aspirations for the harbour.

LPC acknowledges the questions raised about the reclamation and whether it should be provided for as 'recovery' in the Recovery Plan. Section 8 of this Report provides a critical assessment of 'recovery' against the relevant provisions of the CER Act. This assessment is undertaken from an overall point of view of all components of the recovery works, analysing all effects, to determine whether the Recovery Plan will meet the purpose of the CER Act.

5.5 Capital Dredge CIA

A CIA prepared in May 2014 for LPC's proposed Capital Dredging Project is also relevant, as the lengthening and deepening of the existing navigation channel is required to enable the port to respond to growth and accommodate the next generation of container vessels. The report (similar to the Recovery Plan CIA) notes concerns with the cumulative effects of proposed and existing LPC activities on mahinga kai values in Whakaraupō, and the desire for a whole harbour approach to understanding and addressing impacts.

5.6 Recommendations

The CIA has recommended a number of actions to address the issues raised. These recommendations are contained in the following sections.

5.6.1 Thriving port

Reclamation in Te Awaparahi Bay

1. The level of control over the reclamation activity in the Regional Coastal Plan must be no less than afforded by a discretionary activity status, and Ngāi Tahu must be actively involved in the consenting process.
2. The assessment framework for resource consents associated with the proposed reclamation must explicitly reflect Ngāi Tahu values, cultural well-being and use of the harbour as these relate to harbour health and the long term vision of manawhenua to protect and restore the mahinga kai values of Whakaraupō.
3. Ngāi Tahu will seek the following outcomes from the resource consent process for the proposed reclamation:
 - a) Certainty that proposed reclamation will not redirect or obstruct flow in the harbour to the extent that it could result in sedimentation of the upper harbour and/or indirect adverse effects on mahinga kai.
 - b) Offsetting of mahinga kai habitat loss at the reclamation site through support and funding for habitat enhancement in other areas of the harbour, or whole harbour water quality or mahinga kai habitat enhancement initiatives.
 - c) Reclamation design that reflects the value and use of Whakaraupō as a mahinga kai (i.e. naturalise the reclamation to the landscape, recreate habitat along the edges of the structure, etc.), and the ability of Te Rūnanga o Ngāi Tahu to sign off on this design.
 - d) No further structures (e.g. breakwater) beyond the existing reclamation envelope presented in the Port Lyttelton Plan.
 - e) Certainty that construction of the proposed reclamation will not result in sediment or construction materials entering Koukourārata.
 - f) A long term monitoring programme that has a clear mahinga kai component.
 - g) Relocation of mahinga kai species from the proposed reclamation site to another site within the harbour.
4. Ngāi Tahu seek to have a discussion with LPC about reconfiguring the proposed Te Awaparahi reclamation to follow the seaward line of the existing Cashin Quay, not including the Cashin Quay breakwater. This may also include discussing the feasibility of removing the Cashin Quay breakwater if the next generation of larger ships eliminate the need for this structure.

5. Resource consent application(s) for the proposed reclamation must be publicly notified, as this is a major capital works project that will occur alongside our communities.
6. Further investigation and discussion is required to understand the complexities of marine hydrodynamics in Whakaraupō, and the relationship between port structures and sedimentation in the harbour, and therefore the potential indirect effects of the proposed reclamation on mahinga kai.
7. An independent analysis of LPC marine hydrodynamic modelling is required, with matters of interest to Ngāi Tahu informing this analysis.

Re-instatement of damaged existing port infrastructure

8. Ngāi Tahu support the reinstatement of existing earthquake damaged infrastructure as permitted activities (i.e. do not need consent) provided that:
 - a The effects are no more than existing structures, while allowing for environmental improvement; and
 - b Reinstatement results in improvements to the environmental performance of the infrastructure to minimise the impact of the port on coastal water quality; and
 - c Construction effects are managed by a Construction Environmental Management Plan (CEMP); and
 - d Ngāi Tahu issues and management actions around erosion, contaminants, storm water management, marine mammals, customary fisheries and archaeological values are recognised and provided for in the CEMP.

Bulk fuel berth

9. The bulk fuel berth should remain in the Inner Harbour so that in event of a spill, the contaminants can be contained.
10. If the Eastern Mole is removed to facilitate the Inner Harbour cruise berth option, then another plan must be in place to ensure that the accidental spill of fuel or oil is able to be contained within the inner harbour.

Cruise ship berth

11. Any new infrastructure to enable the Outer Harbour cruise ship berth option must require resource consent. The level of control over the activity must be no less than afforded by a discretionary activity status, Ngāi Tahu must be involved in the consenting process, and the consent must be publicly notified.

Commercial fishing vessels

12. Further discussions are required with LPC to determine if the new infrastructure in Te Awaparahi Bay will be used as berthing areas for commercial fishing vessels, as this activity is incompatible with the regulations governing the proposed Whakaraupō Mātaimai.

Traffic

13. The effects of increased traffic associated with port recovery and expansion must be addressed as a matter of priority, given concerns about the ability of existing infrastructure to cope with increased volumes of traffic.
14. A collective effort is required to ensure that Sumner Road is re-opened.

5.6.2 Connecting with the community

Developing Dampier Bay – connecting with the community

15. Planning for Dampier Bay as an ‘engaging and vibrant water front’ must include an assessment of Ngāi Tahu cultural landscape values to identify opportunities to recognise the relationship of Rāpaki Ngāi Tahu to Whakaraupō and the Lyttelton area.²⁵
16. Ngāi Tahu and LPC should have a conversation about the provision of a Ngāi Tahu name as an alternative to using ‘Dampier Bay’ for the inner harbour.
17. Any conversations around the naming of places in Whakaraupō must involve Te Hapū o Ngāti Wheke.

5.6.3 Healthy harbour

Lyttelton Port Company as an environmental port

18. Ngāi Tahu encourage LPC to seek to be a world leader in sustainable port operations, demonstrating how a port can contribute to a healthy harbour.

Integrated catchment management plan

19. The Port Recovery Plan should enable the preparation of an Integrated Whole Harbour/Catchment Management Plan within a community based collaborative process.²⁶ A significant amount of work is required to determine the appropriate model for this, but the Recovery Plan provides an opportunity to enable this plan and address the long term requirements for a safe, healthy harbour that is a port and a mahinga kai.

Addressing existing sedimentation issues

20. The Port Recovery Plan should include policy or rules to enable dredging of the upper harbour by LPC, for the purposes of mahinga kai habitat restoration, subject to full scientific investigation and agreement between LPC and Ngāi Tahu on key issues such as location, extent, depth, effects on mahinga kai, and disposal of dredged material.

Biosecurity

21. LPC to ensure that the increased biosecurity risk associated with larger ships, and the berthing of larger ships at the proposed new container terminal at Te Awaparahi Bay (which is in more open waters), is recognised and provided for in effects assessments.

It must be recognised that these are recommendations from Ngāi Tahu and are not necessarily shared or supported by LPC. LPC has endeavoured to take these concerns and recommendations into account where possible. For example:

- the proposed Regional Environmental Coastal Plan rule enabling the reclamation provides a controlled activity status, but with limited notification to Ngāi Tahu, controls regarding to the methods to control the propagation of sediment plumes and the preparation of a Kaimoana Management Plan;

²⁵ Policy WH6.7 (a) in the Mahaanui IMP 2013 sets out the need to recognise the relationship between tangata whenua and the Lyttelton area during rebuild and recovery. Policy WH9.2 identifies the use of physical markers on the landscape (e.g. pou whenua, artwork) that reflect the historical and contemporary associations of Ngai Tahu to particular places.

²⁶ Policy WH1.4 in the Mahaanui IMP - Restoring the cultural health of Whakaraupō requires a holistic, whole-harbour approach, recognising the cumulative effects of all activities and requiring collaboration and integration of efforts between local authorities, Ngāi Tahu, the community and other agencies.

- LPC has drafted a Construction and Environmental Management Plan (CEMP) to comprehensively address construction effects.

LPC cannot however support publicly notified resource consent hearings as this would not provide for a focussed, timely and expedited recovery.

It is acknowledged in the CIA that these recommendations are based on a lack of time to fully consider all technical reports, as well as uncertainty about LPC's technical reports. Ngāi Tahu's concerns are also raised on the basis that they wish to ensure robust and independent testing of information, so that the technical reports to support the Recovery Plan process do not result in a lower level of protection for harbour health and Ngāi Tahu values than what would be required within an RMA process.

LPC shares the view that the Recovery Plan process should not result in a lower level of protection for harbour health and Ngāi Tahu, and, with Ngāi Tahu, also considers the Port Recovery Plan presents an opportunity to take a wider look at harbour health, to enable a collective, whole catchment integrated management approach to address key issues.

LPC strongly values its relationship with Te Hapū o Ngāti Wheke (Rāpaki), Te Rūnanga o Koukourārata and Te Rūnanga o Ngāi Tahu and is firmly committed to working together throughout this Recovery Plan process.

In addition LPC considers it is important to highlight that there are a number of checks throughout this process that should give Ngāi Tahu some additional comfort that the process will be robust and result in a Recovery Plan that will address the issues raised by Ngāi Tahu. For example:

- It is also hoped that the peer review of the technical reports being undertaken by the Canterbury Regional Council will give Ngāi Tahu some comfort that LPC's technical reports will be fully tested.
- Following the provision of this report, and the accompanying technical report, clause 6.7 requires the Canterbury Regional Council to develop the draft Lyttelton Port Recovery Plan in consultation with a number of parties, including Ngāi Tahu.
- The public hearing and submission process that is required by the Direction will also provide another check on LPC's technical reports. LPC would expect Ngāi Tahu to be heavily involved as a submitter through this process. It is considered that a number of issues raised in the CIA would also appear in Ngāi Tahu's submission on the preliminary draft Recovery Plan (should they choose to lodge a submission).

It is therefore important to understand the CIA has the status of a working document that provides a basis for ongoing work with LPC and the Canterbury Regional Council throughout this Recovery Plan process. Ultimately, the purpose of this Recovery Plan process and public hearing is to ensure that changes to the relevant planning documents to enable the Port's recovery are fully tested and based off sound environmental assessments, while still ensuring a focussed, timely and expedited Port recovery.

6 First Phase Impact Assessment

Section 6.5 of the Canterbury Earthquake Recovery Minister's Direction (Gazetted 19 June) states that LPC must Environment Canterbury with the necessary information to enable a preliminary draft Recovery Plan to be prepared. The Direction included the requirement to include:

"The first phase of an "Impact Assessment", as required by section 7.1 of the Recovery Strategy for Greater Christchurch – Mahere Haumanatunga o Waitaha;" (Section 6.5.5)

This summary sets out the process undertaken to prepare, and the outcomes of the first phase Impact Assessment. Discussion is based on a report prepared by the Canterbury District Health Board, specifically the Health in all Policies Team ('HiAP') "Lyttelton Port Recovery Plan, Well-being Impact Assessment" (October, 2014) which sets out the conclusions associated with the First Phase Well-being Impact Assessment ('WIA'). The full report is included as Appendix 5. Note that the well-being terminology was deemed as more appropriate for this project than impact assessment.

6.1 Assessment Context

The overall purpose of the first phase of the WIA was to develop criteria for ECan (and possibly the Minister) to use in assessing the outcomes of the LPRP through its development. The first phase did not attempt to actually assess the impacts, rather develop appropriate criteria and with stakeholders indicate what the expected 'top and bottom lines' are for outcomes from the LPRP.

To develop the criteria, the WIA team completed a thematic analysis of the recent consultation to develop a draft set of 39 criteria that were anticipated to apply to those likely to be affected by the plan. The criteria took into consideration the scope of the LPRP from the Ministers gazette (No.65), experience with previous impact assessments, and other relevant policy and strategic documents. Due to the short time available all social, cultural, health, environmental and economic criteria were scoped and developed at the same time.

A WIA stakeholder workshop was held to review and develop the criteria and the draft criteria were sent as pre-reading to all workshop participants. A presentation and work through of the draft criteria was also held with the CCC LPRP Working Party to ensure a wider range of community views were included.

The First Phase WIA criteria were based on the Te Pae Mahutonga framework and of understanding Port recovery impacts on the well-being of four population groups:

- Ngāi Tahu (specifically Te Hapu o Ngāti Wheke);
- Port Staff and contractors;
- The Lyttelton community; and
- People of the wider Canterbury area.

The 39 Criteria were based on five themes being: Environmental; Social and cultural support / well-being; Transport (including active transport); Economic (including tourism); and Recreation (on and off the water), with assessment providing a 'score' ranging from a moderate negative impact (-2) to a strong positive impact (+3).

The scope and details of the criteria were amended within the stakeholder workshop (40 attendees), in-house assessment and a specific presentation to the CCC LPRP Working Group. Further evaluation of the criteria was also undertaken by Community and Public Health following the workshops.

6.2 Assessment Summary

The top and bottom lines for all criteria were within the positive impacts scores. That is, there is an expectation that the LPRP will result in beneficial outcomes across each of the specific 39 criteria. The extent of positive outcome is dependent on the degree to which the LPRP facilitates an approach in each discipline to not only achieve an appropriate well-being outcome, but strives to enhance the values of the criteria considered.

By way of example, the LPRP as considered against criteria for 'Respect for multi-cultural values' will result in an outcome that can lead to either:

- Bottom line: A small positive impact (+1), through recognising the importance of multi-cultural and spiritual values; to
- Top line: A strong positive impact (+3), through actively providing for multi-cultural and spiritual values.

The strong positive expectations across the criteria are not surprising. The LPRP provides for greater integration of the Port's functions. It should, at the same time provide certainty to the community by showing a clear process for the rebuild of the Port as well as giving the public the ability to provide input to the plan.

Those matters in the First Phase WIA consistently evaluated as expecting a strong positive impact include:

- Freight Transit corridors (Sea);
- Protecting and enhancing water quality;
- Terrestrial ecosystem health and biodiversity is protected and enhanced;
- Land reclamation in Te Awaparahi Bay (impact management);
- Management of noise;
- Management of light spill;
- Sedimentation management;
- Sustainable built environment;
- Economic recovery of Christchurch and Canterbury;
- Pedestrian and cycle access;
- Recovery Plan process communication;
- Kaitiakitanga responsibilities;
- Mahinga Kai;
- Use of local labour and expertise;

Those matters in the First Phase WIA consistently evaluated as expecting a weaker positive impact includes:

- Freight transport corridors (land);
- Navigational safety;
- Climate change and sea level rise;
- New recreational opportunities for residents and tourists;
- Thriving local businesses – recovery and growth;
- Way finding/legibility;
- Connections with existing recreational walking and cycling routes;

- Port efficiency;
- Community involvement and inclusion in recovery;
- Recognising Lyttelton Port's heritage.

6.3 Conclusion and Summary

The first phase WIA has developed a set of criteria and 'top and bottom lines' for the expected outcomes of the LPRP. These criteria set out the expectations of how impacts should be managed, and conflicts reconciled such that Port recovery can take place without crossing specific bottom lines.

There are a series of recommendations, principally that the First Phase WIA is endorsed and continued by Environment Canterbury in finalising the Draft Port Recovery Plan.

Specific recommendations include:

- Environment Canterbury uses the criteria in the First Phase WIA to carry out a formal WIA of the Lyttelton Port Recovery Plan and reports on their findings and how it influenced the final content of the Lyttelton Port Recovery Plan;
- That the criteria can be modified as required during the LPRP development, but that a Steering Group be set up to assist with these changes.
- That the Integrated Recovery Planning Guide is used by Port and Environment Canterbury Staff as a reference alongside the criteria for both developing and assessing the Plan;
- The Lyttelton Port Recovery Plan take every opportunity to improve the Port operation and its effects on surrounding environments and communities within the planning process and utilising the relationships formed during this process. The Plan needs to utilise a whole of harbour approach.
- Community representation focusing on well-being issues is embedded in the ongoing Port redevelopment process.
- Environment Canterbury and Port of Lyttelton Staff work with Community and Public Health to complete the formal evaluation of the Well-being Impact Assessment as described in the evaluation plan (Appended to Lyttelton Port Recovery Plan, Well-being Impact Assessment" (October, 2014).

7 Environmental effects of the Proposed Lyttelton Port Recovery Plan

The following sections summarise the technical effects assessments undertaken by the independent subject matter experts. Where relevant there is also evaluation of effects and the expert's recommendation against the CER Act, the existing rules and the proposed amendments.

7.1 Economic effects

This discussion of the Economic Effects of Port Recovery is based on a report prepared by Brown, Copeland & Co Ltd titled "*Lyttelton Port Recovery Plan, Assessment of Economic Effects*" (12 November, 2014). This report is attached as Appendix 6.

7.1.1 Background

Growth in trade through the Port has been rapid in recent years and this is expected to continue in the case of containerised cargo. Growth in non-containerised cargoes is expected to continue but at more modest rates.

Prior to the earthquakes, LPC had a development strategy in place to meet the required capability to accommodate larger ships and the expected future growth in trade. This strategy to meet the required demands on the Port has needed to be reconsidered in light of the restoration work required, and to overcome constraints at the Port that would otherwise hinder the greater Christchurch rebuild process.

The primary reasons for the expected growth in trade volumes through the Port are (i) the continued growth in the Canterbury region's (and the rest of the South Island's) agriculture and agricultural product processing industries; (ii) the Christchurch rebuild; and (iii) the move towards larger container vessels on New Zealand's international trade routes resulting in a greater share of the South Island's containerised cargoes moving through Port Lyttelton.

LPC is currently utilising all available land for its container terminal which is operating at capacity.

The Port needs to expand to more adequately service current volumes of trade, to meet expected future growth and to accommodate the recovery of LPC's facilities as a consequence of the damage from the earthquakes. Without the Port's own recovery, there is a significant economic risk for the region and for Christchurch's recovery. As part of its long term recovery, LPC wishes to undertake a package of investment projects which incorporate both:

- The repair and reinstatement of damaged and destroyed assets; and
- The development of new capacity to meet current demand and expected future growth.

The sequencing of these projects requires priority based on factors such as meeting insurance purposes, and for the Port to continue to meet customer and operational demand throughout the period of reconstruction. An orthodox Resource Management consenting process would significantly delay and constrain the ability to prioritise and commence these works in a holistic manner.

7.1.2 Economic significance of the Port

Lyttelton Port is recognised as a "lifeline utility" and "significant infrastructure" at a national and regional level. It plays an essential role in the current and future economic well-being of the Region in that it is a key economic driver of the Canterbury and South Island economy, helping to underpin much of the economic activity in greater Christchurch; and the Port contributes to the Christchurch rebuild process.

As at June 2014, LPC's property, plant and equipment was valued at \$248.9 million. In the year to 30 June 2014, LPC:

- Collected \$115.8 million in revenue, provided 535 jobs and paid \$42.3 million in salaries and wages; and
- Spent \$49.0 million on goods and services, much going to local suppliers.

In terms of tonnage, Lyttelton Port is the largest port in the South Island, and the fourth largest in New Zealand. It is the second largest export port behind Tauranga. In the year ending 30 June 2014, a total of 6,569,236 tonnes of overseas cargo was loaded or unloaded through Port Lyttelton, accounting for 11.1% of all New Zealand seaports' trade – 11.3% of exports and 10.7% of imports. By volume, Port Lyttelton accounted for 47.4% of South Island seaports' overseas trade – 46.3% of exports and 49.5% of imports.

By value, in the year to 31 December, 2013 exports through Lyttelton Port were 49% of the South Island's value of exports from sea ports, up from 29% in 2005. Imports through the Port were 73% of the South Island's value of imports arriving via sea ports, up from 64% in 2005.

In the year ending 30 June 2014:

- 376,567 twenty foot container equivalent units (TEU's) were moved through the Port, an increase of 7.2% on the previous year, and an increase of 50.2% over the last six years.
- Exports of coal increased by 2.7% on the previous year to 2.07 million tonnes;
- Log exports rose 62.7% on the previous year to 601,485 tonnes;
- Bulk fuels volumes decreased by 6.0% compared to the previous year to 1.04 million tonnes; and
- Dry bulk imports were up by 18.4% on the previous year to 769,019 tonnes, driven largely by a 21.7% increase in cement imports.

7.1.3 Providing for forecast growth

Growth forecasts²⁷ for trade through the Port have containers growing at a rate of between 2.7% and 5.3% per annum from 376,567 TEUs in 2014 to between 782,000 TEUs and 1,500,000 TEUs in 2041. If Lyttelton Port becomes big ship capable then the higher end of the forecast range is more likely.

Should Lyttelton become big ship capable the Port will be able to accommodate the global increase in larger container vessels which are expected to range in size from 5,000 to 7,000 TEU. At present, the average sized container ship calling at New Zealand ports has a capacity of 2,700 TEU.

In fulfilling this potential to cater for bigger ship capacity, the additional reclamation, container terminal, quarry, and inner harbour are intrinsically linked. The existing quarry will provide rock for the proposed reclamation at Te Awaparahi Bay, for both fill material and rock armouring.

The reclamation will be undertaken in a staged approach to provide for critical additional container capacity at the earliest opportunity. The reclamation will ultimately provide for a container handling yard connected to two modern berths designed to handle the larger 5,000 to 7,000 TEU capacity vessels; these require a draught of up to 14.5m and can be some 300m in length.

²⁷ Source: Freight Infrastructure Statement Draft Report. Aurecon, Version B. February, 2014.

Cashin Quay No.2 is currently being rebuilt. The Cashin Quay berths will handle containers in the medium term, but change to handling general, bulk and break-bulk cargoes after container handling is established at Te Awaparahi Bay. Coal will continue to be handled at Cashin Quay No.1.

Moving these operations to the east, will result in the eastern part of the harbour (Wharf No.3 eastwards) still undertaking cargo handling operations but focusing on those with less nuisance impacts (dust and noise).

The strategy seeks to reduce the extent of heavier operational capacity from the Inner Harbour over time. This provides for the development of Dampier Bay with a mix of compatible commercial development and an initial 200 berth marina facilities. Central to the Dampier Bay redevelopment is the outcome of improving public access and connectivity between Lyttelton Township and the western inner harbour.

The buildings, promenade and public spaces at Dampier Bay will be undertaken in a way that respects the character of Lyttelton Township. Provisions are being imposed on the type and extent of commercial opportunities, which when coupled with the practical characteristics of Dampier Bay will mean that the overall development remains compatible with the economic potential and growth of Lyttelton Town Centre and Lyttelton Township.

Inner Harbour and Outer Harbour Cruise ship options are being considered. Both options require considerable capital investment, with limited returns to the Port of Lyttelton itself. Expenditure in Christchurch City from the cruise ship industry was estimated at \$32.7 million during the 2012/2013 season where the majority of ship visits were diverted to Akaroa. The provision of cruise berthing facilities in Lyttelton Harbour would increase the economic benefits of the cruise ship industry to the region.

An economic scenario based on container trade has been undertaken to consider the implications of a delay by five years in expanding the container terminal onto Te Awaparahi Bay. The five year delay has been assumed as the period required in obtaining necessary consents under a non-Recovery Plan, orthodox Resource Management Act (1991) process.

Under the high container growth scenario, per year economic savings are in the range of \$15 million in 2021 to \$81 million in 2025. That is, the Lyttelton Port of Christchurch can provide capacity for container growth and not rely on other South Island Ports shipping containers LPC cannot handle.

Under the low growth scenario, the number of containers which can be handled by existing terminal capacity (ignoring necessary recovery works on current container terminal areas) is not reached until 2026. However, this involves an extended sub-optimal period for Port efficiencies due to land area constraints. This is likely to lead to the need for containers to be diverted to other ports prior to 2026, imposing costs on exporters and importers.

7.1.3.1 Summary

The Port Recovery Plan is designed to remove obstacles to economic recovery, provide greater certainty, co-ordinate and prioritise infrastructure investment, leverage restoration investment to also provide new facilities required for changing circumstances and future growth, provide resilience against future seismic activity, help restore the brand and reputation of greater Christchurch as a place to invest and do business, and to enhance the overall level of economic well-being for the City and the wider Canterbury Region.

The ability of the PLRP to expedite the focused reinstate of Port facilities is consistent with the CER Act and CERA Recovery Strategy.

In particular, clause 5.1 of the Direction seeks to ensure that: “*theeconomic ... well-being of surrounding communities and Greater Christchurch, and any potential effects with regard to ... the economic sustainability of Lyttelton Town Centre*” are addressed (clause 5.1.2) as well as “*the needs of users of Lyttelton Port and its environs including, ... importers and exporters, cruise ship..., commercial fishers...*” (clause 5. 1.4) are also addressed.

The combined Port Recovery program of works will over the next 15 years involve expenditure of some \$900 million, much of which will be spent in Christchurch City. Directly associated will be an estimated additional 70 to 80 jobs, and annual payments of \$5 million in wages and salaries. With the inclusion of indirect, or multiplier effects, the programme of works will generate around 150 jobs and \$10 million per annum in household income for Christchurch City residents.

Without a Port Recovery Plan there will still be a programme of works to rebuild and restore Port facilities which will provide economic benefits to Lyttelton, the City and the region. The extent and timing of such benefits would be less optimal than when compared to the greater planning certainty and flexibility provided by the Port Recovery Plan.

7.2 Effects on Social Values

This discussion of the Social Effects of Port Recovery is based on a report prepared by Taylor Baines and Associates titled “*Lyttelton Port Company Recovery Plan, Strategic Social Assessment*” (October, 2014). This report is attached as Appendix 7.

7.2.1 Background

Lyttelton Township and the Port sustained significant physical and social disruption as a consequence of the Canterbury earthquake sequence. Some 60% of the Lyttelton main street suffered structural damage, with a disproportionate impact on historic commercial buildings. LPC ensured that the core services at the Port were restored within 96 hours, allowing goods to be forwarded to affected areas of Christchurch and maintaining export and import trade movements. However, LPC sustained a significant loss of resilience requiring substantial infrastructure repair and reinstatement.

The social fabric of Lyttelton is inextricably linked to the Port. While the Port has provided employment and has been a major element in the character of the town, providing a working backdrop, along with the activity, noise, and traffic that goes with a functioning Port, the town has provided a residential component to the workforce, which has diminished considerably over time, and a range of related businesses and social facilities. Importantly, the town and the Port are immediate neighbours.

LPC recovery relates to the expedited recovery of port infrastructure while maintaining and increasing operational capacity.

The wider Lyttelton community recovery, in terms of the LPRP, is related to the opportunities for re-connecting town and harbour, and strengthening the relationship between the community and port company.

The recovery of the Port, and the manner in which it is undertaken considerably influences social well-being outcomes in Lyttelton and Canterbury. Such social outcomes range from: regional benefits associated with meeting growth in export and import trade, employment and regional welfare; to more localised impacts, both positive and negative associated with the extent and management of construction activities, sustained community engagement, and efforts through the redevelopment of Dampier Bay to enhance waterfront public access and a broad range of facilities.

7.2.2 The contextual setting for social well-being and implications

There are distinct communities of interest associated with the Port of Lyttelton, its operations and recovery, including: Lyttelton and harbour settlement residents; businesses operating in Lyttelton; and people employed at the Port. Recreational users and wider economic considerations are considered in Sections 4.19 and 4.1 respectively.

As detailed in Section 2, the Port Recovery will consist of many projects involving repair, rebuilding and reconfiguration works which ultimately result in the moving east of port operations in a timely manner.

These works have the potential to generate: considerable demolition and re-construction effects (noise, dust); growth in vehicle traffic and freight associated with increased freight handling and construction; short-term challenges and longer-term improvements to workplace safety, and issues associated with re-locating the existing Diamond Harbour ferry facilities.

The implications of such activities on social well-being influence: immediate job security for those working at the Port, the ease of movement and access of residents, port employees and freight transport on the road network; employment and business gains; short to medium term impacts on residential amenity during reconstruction; a long term lessening of Port operational nuisance on residences close to the Inner Harbour; integration and enhancement of public access to specific parts of the Inner Harbour waterfront and new ferry facilities with development at Dampier Bay; and the provision for the return of Cruise ship visits.

Under the LPRP, LPC envisages a coherent, long term recovery sequence for restoration and future growth. Consultation associated with preparing the Port Lyttelton Plan provides for the community and stake holders to actively engage in the recovery extent and its implications.

7.2.3 Social setting

The town of Lyttelton, became the gateway to the Canterbury Plains when it provided a safe anchorage for the first immigrant ships to the province in 1850. Over the last 160 years social change in the town has been closely linked to developments at the Port, maritime services, and the rail and road networks which expedite the flow of goods and people through the Port.

Over the past 17 years the resident population of Lyttelton has declined by 7.5%, which is in contrast to the communities around the harbour, and to a lesser extent Christchurch itself. Whilst the extent of the decline is a consequence of the earthquakes, Lyttelton's population was gradually declining prior to 2010. The City's growth over the same 17 year period was 7.9%.

In 1951 workplaces at Lyttelton provided 1,350 residents with employment (850 of them in port activities), and a further 500 residents worked in Christchurch. There were also 400 watersiders and 50 railway staff employed in port activities whose home was in Christchurch. Port workers are now well distributed throughout Christchurch City; with currently 15% in Lyttelton Harbour settlements and 80% in the rest of Christchurch. LPC currently employs 525; other contractors at the port employ about 40; other port-related activities (e.g. road and rail transport) and other service providers to LPC are not counted in these numbers.

Many buildings associated with social and community facilities were damaged by the Canterbury Earthquake sequence. However, the extent of disruption to public agencies, service organisations and community groups was limited. Indeed many were central to the recovery efforts since the earthquakes. Some community organisations now operate out of alternative spaces or in different format. All three emergency services – police, fire service and ambulance – have bases in Lyttelton.

The two primary schools, Lyttelton West and Lyttelton Main have merged and will be known as Lyttelton Primary School, with the new school set to open on Oxford Street in mid-2015.

Businesses are at various stages of rebuilding. Whilst one bank has closed since the earthquake, two banks maintain ATM services on London Street. The Supermarket has been recently re-opened and is considering weekly deliveries to Diamond Harbour. A number of cafes, bars and restaurants have re-opened in the central area of Town. Significant marine industries such as the Stark Brothers and Lyttelton Engineering continue to operate as before.

The Black Cat Ferry service is an important service linking Lyttelton with Diamond Harbour. The service also links visitors to Lyttelton to other attractions such as Quail Island.

Community recovery in Lyttelton in some respects is further advanced than in many suburban communities. In part this relates to the strong sense of community connectedness in Lyttelton. It also reflects the extent of active engagement the community and associated agencies have undertaken in seeking to pursue recovery.

Led by the Lyttelton / Mt Herbert Community Board, the Lyttelton Masterplan (June 2012) provided a comprehensive summary of community ideas and priorities for the Lyttelton Town Centre and beyond. Many of these ideas and priorities have implications for the LPRP, particularly in terms of continued engagement, public access to the waterfront, the use of Norwich Quay and managing the effects of Port recovery.

7.2.4 Social impacts of the LPRP

The most significant implications for social well-being associated with the LPRP are associated with:

- Future levels of employment at the port. The benefits include job security supporting a range of flow-on social benefits to individual workers, their households and their communities; the reclamation (which enlarges the operational Port area) and re-constructed port facilities ultimately creates the conditions for a safer working environment;
- New waterfront access and amenities at Dampier Bay, which will provide an additional focal point for Lyttelton residents to engage in community activities and establish social connections. Improved access to the waterfront assists to re-connect residents with the harbour, and also assists in post-quake psycho-social recovery;
- New business opportunities would be created at Dampier Bay, with flow-on social benefits, including a wider range of accessible services and goods to the Lyttelton community;
- A re-located ferry terminal, which provides greater long-term certainty, the potential for increased capacity and enhanced level of amenity and service for users of the ferry service;
- Consultation and participation, through both this Recovery Plan process and further engagement creates a stronger, positive relationship between the Lyttelton Port Company and the town of Lyttelton;
- There will be growth in vehicular traffic through the tunnel and along Norwich Quay with the potential risk of tunnel congestion extending emergency (ambulance) response times; reduced environmental amenity values on Norwich Quay, and exacerbated access issues across the State Highway; and
- Recovery and redevelopment will create off-site amenity effects. The existing levels of noise exposure are likely to be exceeded and for an extended period of time, affecting residential amenity values for some. Once complete, the reclamation and the rebuild of Cashin Quay offers the prospect of reduced exposure to port noise with the consequent improvement in these amenity values.

LPC propose a number of methods to manage the negative social-well-being aspects of the LPRP, and optimise social benefits. These include:

- Engaging in the Recovery Plan process which provides a coherent, long term sequence for restoration and future growth, including employment retention and growth;
- Preparing and implementing a Construction and Environmental Management Plan (CEMP) for the Port Recovery, this together with the LPC OSH Plan seeks to ensure a safe working environment.
- Implementing an outline development plan for Dampier Bay, to be inserted in the suite of District Plan provisions. This plan will outline how Dampier Bay is to be developed, including its amenity, character, and links from the township to the waterfront and ferry terminal;
- Continued voluntary engagement on projects outside of the statutory process (for example Dampier Bay development, and construction activities);
- Advocating to NZTA and the CCC to formalise and engage on amenity and access improvements to Norwich Quay;
- Manage its construction effects through provision of an updated Noise Management Plan, administered by the Port Liaison Committee, and Construction Environmental Management Plan to recognise and respond to cumulative effects of construction and operational noise.

7.2.5 Summary and proposed changes to the Rules in the District Plan

The social assessment concludes that there are significant potential social benefits that can be realised through the Recovery Plan process. The realization of benefits is dependent on 37ha of reclamation at Te Awaparahi Bay, which enables a cascade of changes in the location of port activities, thereby freeing up space in the Inner Harbour for public access. If the full reclamation does not proceed, the scale of potential community benefits will be more limited.

Several potentially significant social costs have also been identified during this assessment, specifically growth in vehicle traffic to the Port, and the extent of off-site effects associated with Port operations and reconstruction. These matters can be adequately addressed through amendments to the State Highway network, and appropriate controls in the District Plan to provide nuisance management and for the development of Dampier Bay.

7.3 Effects on recreation and tourism

This discussion on recreation is based on a report prepared by Rob Greenaway & Associates titled "Lyttelton Port Recovery Plan, Recreation & Tourism Assessment" (October, 2014). This report is attached as Appendix 8.

7.3.1 Existing environment

Lyttelton Harbour is a regionally important marine recreation setting. Recreation and tourism activities in general comprise of the following:

- While the recreational fishing resource is regarded as quite average, it does provide an inshore recreation opportunity;
- Swimming is primarily focussed on the small sandy beaches and coves around the upper harbour, particularly Corsair Bay, and around Purau and Camp Bays on the southern side of the harbour;

- Diving opportunities are limited in the upper harbour due to the natural turbidity of the water. Diving improves in the outer harbour and around the headlands where water clarity improves;
- Small boat sailing (including kayaking, stand up paddle boarding, and waka ama), is popular especially in the middle and upper Harbour, although yachting and recreational boating occurs throughout the entire harbour area. The Naval Point Yacht Club area provides the primary small boat haul out facility in the Harbour, and the existing pile marina provides limited marina facilities for recreational boating within the inner harbour area;
- There are limited commercial water-based recreation and tourism services or businesses, with these largely confined to several charter vessels, including the Lyttelton Tug and the regular service of the Black Cat ferry, which also includes services to Quail Island over the summer months;
- Land based recreation within the Port area is limited to the Lyttelton recreation grounds at Naval Point, with these grounds gazetted as a reserve and held by the Christchurch City Council. The recreation grounds provide for both organised team sports and for informal recreation when the sports grounds are not otherwise in use;
- Land-based recreation in the wider area is focussed on walking and cycling, with routes such as the Crater Rim walkway and Bridle Path popular. Road cycling prior to the earthquakes was also popular through Lyttelton township, with Evans Pass/ Sumner Road forming part of the 'long bays' loop route. With the closure of Sumner Road, recreational cycling opportunities to Lyttelton are limited as the township essentially forms a 'dead end', necessitating a return journey via Dyers or Gebbies Passes rather than a loop;
- Lyttelton Township attracts primarily domestic tourists that are often visiting friends and family in Christchurch. Activities such as the weekly farmers market, along with events and festivals also attract primarily local visitors to the township;
- Cruise ships have an important role to play in the Canterbury tourism industry. Ship visits have been significantly reduced following the earthquakes and the associated damage to berths, with cruise ships either by-passing Canterbury, or alternatively visiting Akaroa Harbour.

7.3.2 Implications of the LPRP

The anticipated recreation and tourism effects of the proposed Port Lyttelton Plan are substantially positive for both the local community and wider Christchurch, due to the scale of benefit afforded by the proposed enhanced marina and waterfront public access and associated activities and amenity in Dampier Bay. Dampier Bay regeneration and recovery has many potential development opportunities and has wide community support. From a recreation and tourism perspective, the ability to co-locate a range of retail, service, recreation, community, heritage and transport options in a potentially very appealing marine setting will be a positive outcome, especially when compared to the status quo environment of very limited waterfront access, marina facilities, and recreation and tourism activity.

The re-establishment of a cruise ship berth and associated facilities (should such prove to be commercially viable) will also have a positive effect on the wider tourism industry through facilitating both more visits and reducing travel time from port to Christchurch relative to alternative mooring in Akaroa harbour.

In addition to the above significant positive effects, the Recovery Plan also has the potential to have some adverse effects on recreation and tourism that, in summary are:

- Minor adverse effect on recreational boating due to the occupation of public marine space through the proposed reclamation;

- Potentially adverse effects for keeler and trailer sail yacht racing if a cruise ship berth in the outer harbour is developed, although some mitigations may be identified via consultation with the Naval Point Club in terms of race day management and berth design, should the outer harbour be confirmed as the preferred location for a cruise ship berth;
- Limited effects on recreational fish and shellfish species due to a loss of marine habitat through reclamation;
- Potentially adverse effects with regard to marine mammal viewing.

7.3.3 Proposed changes to the Rules in the District Plan

No specific recreation and tourism-related rules are necessary in the District Plan to manage effects. The District Plan regulatory framework does need to provide for a range of activities within Dampier Bay to facilitate the development of a marina and associated public waterfront area and visitor infrastructure, including provision for connecting this area to the town centre. The suite of proposed District Plan provisions are discussed in more detail later in the Recovery Plan.

7.3.4 Other methods

In the event that a cruise berth is progressed in the outer harbour, consultation will be necessary with the Naval Point Yacht Club to explore how to manage any potential effects on yacht racing activities when cruise ships are in harbour. The development of the Dampier Bay marina will also involve licensing agreements being reached with marina occupants regarding the occupation and use of marina space.

7.3.5 Conclusion

From a recreation and tourism perspective, the recovery and renewal of Dampier Bay and the provision of a large, functional marina facility have significant benefits for both recreation and tourism, and for both the local and wider Christchurch community. These benefits readily outweigh minor adverse effects to recreational boating and fishing caused by the loss of some open water to reclamation and marine habitat. The re-establishment of a cruise ship berth will likewise have an important benefit for the recovery of the tourism industry in Christchurch.

7.4 Effects on Heritage

This discussion on heritage is based on a report prepared by Underground Overground Archaeology Ltd, titled "*Lyttelton Port Recovery Plan, Archaeological Assessment*" (August, 2014). This report is attached as Appendix 9.

7.4.1 Existing environment

Two 'protected' heritage buildings and one 'notable' heritage building are identified in Appendix IV and V respectively in the operative District Plan as being located within the Recovery Plan area. The 'protected' buildings are the Lyttelton Graving Dock and pumphouse located on Cyrus Williams Quay, and the 'Moorhouse Rail Tunnel Railway Line'. Both these buildings/ structures have a category 1 registration with Heritage New Zealand). The notable building is a signal box located adjacent to Gladstone Quay. Pre-earthquake, there were a further three protected buildings located within the Recovery Plan area located at 5-7 Norwich Quay and known as the Old Harbour Board Office, the Forbes Building, and the Post Office. All these buildings were substantially destroyed through the earthquake sequence.

The Port is located in close proximity to the Lyttelton Town Centre which is a registered Historic Area by Heritage New Zealand and that contains a number of listed heritage buildings. The Port is

also in close proximity to the historic Bridle Path walking route from Lyttelton to Christchurch and is home to the historic Lyttelton tug boat.

The area within the project boundaries has been the subject of a number of archaeological investigations. This work has provided information relating to the occupation and use of the area by both Māori and Europeans and has resulted in the recording of nine archaeological sites into the New Zealand Archaeological Association's digital database, ArchSite (Table 7.1).

Table 7.1: Archaeological sites recorded within the project boundaries
(Source: ArchSite)

NZAA site number	Site type	Māori or European	Description
M36/42	artefact find	Māori	Artefact.
N36/57	midden/oven	Māori	Midden.
M36/229	midden/oven	Māori	Midden and oven remnants.
M36/93	military (non-Māori)	European	Gun emplacement.
M36/99	military (non-Māori)	European	Rifle butts.
N36/106	military (non-Māori)	European	Musket trenches.
M36/230	commercial	European	Nineteenth century building location.
M36/220	commercial	European	Commercial building built 1863.
M36/205	transport/communication	European	Christchurch to Lyttelton Rail Tunnel.

The Recovery Plan area has also been subject to a broad assessment by Underground Overground Archaeology Ltd as part of preparing the necessary information to inform the Lyttelton Port Recovery Plan process. This assessment involved consulting a wide range of sources outlining the history of the area. Both primary and secondary sources were used. Amongst the primary sources consulted were the extensive collection of historic maps and plans held by Lyttelton Port of Christchurch (LPC holds some hundreds of such documents), historic photographs and survey plans available via Landonline.

The investigation of the various historical sources, and the subsequent site inspections on both land and water (around wharf piles and foreshore structures) revealed a total of 60 archaeological sites within the boundaries of Lyttelton Port. These sites are evidence of both Māori and European activity in the area. All 60 sites are identified and assessed in terms of their archaeological significance in the Archaeological Assessment, with 5 sites identified as having potentially high significance, namely:

1. Musket trenches (pre-1900) (N36/106)
2. Polhill's Bay rifle range (1866) (M36/99)
3. Graving dock (1879-82) (M36/322)
4. Battery Point battery (1885) (M36/93)
5. Henry Le Cren's house & wharf (1850s) (N36/153)

7.4.2 Implications of the LPRP

The Heritage New Zealand Pouhere Taonga Act 2014 (HNZPTA) provides protection for archaeological sites and is administered by Heritage New Zealand. It is important to emphasise that neither the Lyttelton Port Recovery Plan nor associated District or Regional Plan provisions

override the need to comply with the provisions of the HNZPTA. Under the Act an archaeological site is defined as any place in New Zealand (including buildings, structures or shipwrecks) that was associated with pre-1900 human activity, where there is evidence relating to the history of New Zealand that can be investigated using archaeological methods (Heritage New Zealand 2014a).

Under the Heritage New Zealand Pouhere Taonga Act, anyone who wishes to destroy or damage an archaeological site requires an authority to do so. It is illegal to destroy or damage an archaeological site without an authority from Heritage New Zealand. An authority may be granted with conditions, such as archaeological survey, monitoring and/or excavation. Any archaeologist carrying out work as a condition of the authority must be approved by Heritage New Zealand under the HNZPTA. Once the authority has been granted, there is a statutory 15 working day stand-down period before earthworks can begin.

There are numerous pre-1900 archaeological sites within the boundaries of the Lyttelton Port of Christchurch. Little above ground evidence of many of the sites remains visible today and the extent of below ground remains has at times been difficult to establish. What does remain, however, forms an important archaeological complex (of overall medium archaeological value). If archaeological sites within the port are to be disturbed during the reconstruction of the port, it is important that information about these archaeological sites is preserved before they are lost forever.

7.4.3 Proposed changes to the Rules in the District Plan

No specific changes to the heritage or archaeological rules are necessary in the District Plan to manage effects. Due to the very limited number of identified heritage buildings within the Port and that no works beyond general maintenance are needed to these structures as part of recovery, the general rules framework set out in the District Plan controlling works to heritage buildings can be relied upon for managing effects.

The management of archaeological sites appropriately falls under the provisions of the HNZPTA.

7.4.4 Proposed other methods

The HNZPTA sets out a series of requirements for managing works that have the potential to modify or damage an archaeological site. LPC is in the process of applying for a 'global' authority to damage or modify an archaeological site through undertaking the works necessary for Port recovery. This application sets out a comprehensive suite of management and monitoring procedures to be followed when works are undertaken, including the following:

- If any or all of the six archaeological sites excluded from the global authority are to be destroyed or damaged, separate archaeological authorities should be applied for by LPC.
- All crews involved in earthworks at the port shall be briefed on the possibility of encountering archaeological material during earthworks. The briefing will include information about what archaeological sites look like and what to do if one is found.
- Time should be allowed within the construction programme for archaeological recording.
- All archaeological work should be undertaken by or under the supervision of an archaeologist approved under the Heritage New Zealand Pouhere Taonga Act 2014.
- On no account should any fossicking be allowed on any of the sites, before, during or after archaeological investigations.

The authority will only be granted if Heritage New Zealand are satisfied that the proposed measures are adequate and appropriate.

In addition to the management of archaeological features, the Recovery Plan, and in particular the rejuvenation of Dampier Bay, provides the opportunity to enhance links between the waterfront and the historic town centre and Bridle Path routes, and to provide interpretation of the area's history.

7.4.5 Conclusion

From a heritage and archaeological perspective, the Port area does not include a significant number of listed heritage buildings, with the three buildings/ structures that are identified not needing substantial works as part of Port recovery. The Port does however include some 60 potential archaeological sites of varying significance. The provisions of the HNZPTA provide the appropriate controls on works that have the potential to modify or damage archaeological sites, and LPC is in the process of applying for the necessary authority (and associated management responses and conditions) with Heritage New Zealand.

7.5 Effects on Landscape Character and Visual Effects

This discussion on landscape character and visual effects is based on a report prepared by Boffa Miskell Ltd titled "Lyttelton Port Recovery Plan, Landscape Assessment" (October, 2014). This report is attached as Appendix 10.

7.5.1 Existing environment

The Banks Peninsula Landscape Study (BPLS) prepared by Boffa Miskell in 2007, identifies Lyttelton Harbour as a broad area comprising of 3 geological land areas - the Lyttelton volcanics, the pre-Lyttelton volcanics and the Northern Mt Herbert volcanics. These areas define and characterise the harbour with steep rocky slopes of the upper volcanic caldera rim. Smoother and gentler lower colluvial slopes drop to indented harbour edges. This creates a visually defined harbour landscape.

Landforms within the harbour are dramatic with rocky outcrops expressing the volcanic origins of the landscape. These include the jagged caldera ridgeline, exposed bands of layered volcanic rock formations (stratigraphy), outcrops of vertical dikes and landforms of solidified lava flows. This rugged underlying landscape has been eroded over time to form lower pastoral hills, spurs and bluffs descending to the indented coastal harbour edge. The harbour has a complex edge of small peninsulas and headlands, inlets and shallow mudflats, and Quail Island emerging within the Upper Harbour.

Vegetation cover around the harbour is mixed with predominantly modified and exotic grassland and forestry species. This reflects the sheep farming and forestry activities. Remnant native vegetation is dispersed throughout the harbour with some significant patches being located in areas such as Tauhinukorokio and Buckleys Bay Scenic Reserve.

These elements and characteristics combine to create an overall coherent caldera landscape with a fine grain of complex bays, vegetation and landforms, and attractive settlement areas. The Port of Lyttelton is a visually apparent large element of this landscape located between the Upper and Outer Harbours and closely associated with Lyttelton and Diamond Harbour townships.

Lyttelton Port and Township are located on the north side of the harbour and extend from approximately Naval Point to Gollans Bay in the east. Lyttelton occupies part of the steep, south facing, inner flanks of the ancient Lyttelton volcanic crater. Radial spurs descend from the crater rim forming a natural amphitheatre that spatially and visually encloses the township. The spurs have a soft, rounded form though the uppermost slopes are lined with occasional rocky bluffs and dotted with large rock outcrops.

The upper south-facing slopes above the Port and township remain largely undeveloped and primarily in semi-improved grasslands and regenerating native tussock lands and scrublands. There is also a large area of pine forest in a prominent position on the spur above Sticking Point and the Sumner Road. Much of the regenerating native vegetation lies within Department of Conservation land and is part of the Port Hills recreation area with several walking tracks through it. Lyttelton Harbour is an attractive, coherent and well-defined volcanic landscape with areas of high natural character.

The settlement pattern of Lyttelton Township radiates out from the Port with the historic planned road grid-pattern at its core. Some early cottages and other historic buildings remain since the Christchurch earthquake sequence. These reflect the early European heritage and add to the unique character of the place. It can be anticipated that this built character is likely to change with the future rebuild of the town centre.

The working Port creates an active industrial character to the coastal edge of the town. Historic reclamation has created areas of flat industrial and storage land. Overtime, the coastline between Naval/Erskine Point and Battery Point has been heavily modified by Port activities creating artificial flat land, headlands and harbour coastal edges and an Inner Port area. The historic natural coastal bluffs and edges are still clearly apparent where the slopes meet the flat reclaimed land of the Port.

From Naval Point to Battery Point the current Port activities broadly include: a recreation marina and boat access area at Naval Point, fuel unloading and storage at the "Tank Farm", dry dock and maintenance of boats, an inner port recreation marina, ship berthing and unloading and loading of logs, cars and other cargo at Piers 2-7, a ferry terminal to Quail Island and Diamond Harbour, container port with large cranes up to approximately 80m in height and storage areas, coal storage and loading, and land reclamation near Battery Point in Te Awaparahi Bay.

Beyond Battery Point is Gollans Bay Quarry which is also part of the Site. Gollans Bay is a broad, linear and shallowly indented bay with steep uniform slopes and bluffs. The backdrop to this bay is a quarry that is visibly benched into the cliffs below Evans Pass Road and originally supplied rock for the Cashin Quay reclamation.

The 2010/2011 earthquakes severely damaged the Port removing the full use of many areas of piers and wharves. Visiting cruise ships have ceased to berth at Lyttelton Port and the Port has a reduced capacity to handle cargo. This has left some areas appearing abandoned and awaiting repair or demolition. Within the Cashin Quay area re-piling of the wharves has commenced with large cranes and pole structures associated with the repair works being present.

7.5.2 Implications of the LPRP

The findings from the assessment of visual and landscape effects of the Recovery Plan in summary are as follows:

- 1) The Recovery Plan proposal avoids adversely directly and physically affecting any previously identified outstanding natural landscapes or areas of outstanding coastal natural character.
- 2) The Site adjoins an area of outstanding natural landscape and an area that is likely to be considered high coastal natural character in the Outer Harbour which the proposed reclamation and Container Terminal will have adverse visual effects on. Landscape and ecological restoration proposals are therefore recommended in the landscape assessment to assist with the visual mitigation and integration of the Site and the adjacent natural landscapes.

- 3) The proposed staged developments in Dampier Bay including improved linkages to the town centre will improve the urban amenity of the Port and Town subject to design controls.
- 4) Of the two options for the cruise ship berths, Gladstone Quay is likely to have the less visual impact on the outlook from Lyttelton Township and Diamond Harbour compared to the alternative site in the outer harbour adjacent to Naval Point. Due to the temporary presence of the Cruise ships, and the wider working harbour context, the development of a cruise ship berth at Naval Point is considered to not have significant adverse effects on the quality of outlook from these broad locations.
- 5) Visibility from the Crater Rim Walkway (including the Gondola building) would not be significantly adversely affected by the Recovery Plan proposal due to the viewing distances, the existing Port character and visual screening of landforms.
- 6) Visual effects of the Recovery Plan proposal are likely to be positive from many locations in Lyttelton Township with a finer grain of maritime activity being enabled over time within the Inner Harbour and Dampier Bay. From western parts of the town, the extended Container Terminal would be visible through existing Port infrastructure. In the context of the existing Port, this visibility would not have significant adverse visual impact on views to the Outer Harbour.
- 7) From Governors Bay many houses look east towards the Heads. The proposed cranes on the reclamation area would be visually apparent in this view breaking the open sea horizon line between the Headland land forms adversely impacting on the quality of the view. These focal point views are however seen from over 7kms away in the context of the existing Port and the broad panorama of the Harbour landscape.
- 8) From many residences in Diamond Harbour, the extended Container Terminal would be visually apparent as an extension of the existing Port to the east. From many parts of Diamond Harbour views towards the Port are obstructed by houses, garden plantings and large trees in the Stoddart Point Reserve.
- 9) From the Beach at Purau Bay the extended Container Terminal would be partially visible approximately 3.3kms away between the headlands of the Bay. While this could be perceived by some people as adverse to the relaxed character of the Bay, the visual separation of activities would make the impact of this effect not significant.
- 10) From boats on the outer harbour looking back towards the Port there would be a reduction of visible harbour seascape in the context of the overall harbour. The visibility of vertical structures such as cranes would increase as these are extended eastward and into the harbour channel area. The reclamation area will also be clearly visible from parts of Sumner Road (assuming this route is reopened in the future). This would adversely impact on the existing predominance of landscape and seascape amenity as experienced in parts of the harbour and as viewed from Sumner Road. These elements are not however out of character with the existing harbour landscape although an increase in their visual prominence will occur.
- 11) The visual effect of the extension of the Port into the harbour would be to accentuate the visual and spatial distinction between the Inner and Outer Harbours. This would not necessarily adversely affect the landscape amenity of the Harbour landscape (except as discussed previously), however it would slightly reduce the coherence of the Harbour seascape as a whole.

7.5.3 Proposed changes to the Rules in the District Plan

Land-based activities and built form are managed through the District Plan. In order to safeguard against potentially adverse landscape effects arising, a number of amendments to the District Plan rule package are proposed.

- 1) The inclusion of an Outline Development Plan for Dampier Bay that includes provision for public access to the waterfront, connections between the waterfront and the town centre, landscape planting along the inside edge of Dampier Bay to visually emphasise the historic shoreline, and the provision of view shafts from the seaward end of Veolas Road and from Simeon Quay;
- 2) Urban Design Assessment Matters on the design and form of buildings within Dampier Bay and fronting onto Norwich Quay, and the design of public open space, including accessibility and CPTED (Crime Prevention through Environmental Design);
- 3) Lower height limits at the southern end of Dampier Bay to reflect the lower terrace height;
- 4) Controls on Quarrying and assessment matters regarding the methods for site rehabilitation and planting;
- 5) Continuation of the existing controls on lighting to ensure the potential for glare on nearby residential properties is appropriately managed.

The District Plan rule package is discussed in more detail later in the Lyttelton Port Recovery Plan.

7.5.4 Other methods

In addition to the proposed amendments to the District Plan in response to landscape issues, a number of other methods are also proposed as follows:

- 1) LPC will prepare design guidance for Dampier Bay. The guidance would be provided to developers and designers involved in Dampier Bay. Such landowner-led guidance is a relatively common and established practice in commercial development, particularly in a Greenfield context (both residential and commercial), where the developer will produce their own set of 'in-house' controls to ensure development proceeds in a coherent and compatible manner.

The guidance would cover new buildings and the public realm, with the objective to reflect the historic and industrial character of the Port, including interpretation of culturally significant sites and connections. Consideration would be given to building activation, location, height, size, materials (including recycled materials such as wharf timbers), form and colour, as well as signage, car parking, landscaping, public art and lighting. The design of public realm open space and roading/walkway connections would also be included within the guide.

- 2) LPC to work with the CCC regarding potential works to improve the public realm amenity in Council controlled areas of Naval Point and the vested roads between Naval Point and Dampier Bay;
- 3) LPC to prepare and implement a Landscape/Ecological Restoration and Rehabilitation Plan for the vegetated natural bluffs through the entire site. This plan will also include consideration of amenity planting along Norwich Quay where practicable and subject to liaison with the road controlling authority, and enhancement of the amenity of public viewing areas (currently located on Simeon Quay and Sumner Road) that are currently visually dominated by road barriers, a security fence and rubbish discarded down the embankment.

- 4) Linked to point (3) above, native coastal tree planting and under-planting, and natural local stone rip rap is to be established along the eastern end of the reclamation area of the proposed new Container Terminal to provide landscape and seascape visual enhancement as well as potential for ecological faunal habitat. Planting species are likely to be exposed to strong coastal winds at times and will require careful management during establishment periods. Species could include:
- Myoporum laetum - ngaio (proposed predominant species)
 - Phormium tenax - harakeke/ flax (proposed predominant species)
 - Dodonaea viscosa – akeake (proposed predominant species)
 - Cordyline australis – tī kōuka /cabbage tree
 - Olearia paniculata – akiraho/ golden akeake
 - Coprosma robusta – karamū
 - Pittosporum tenuifolium – kōhūhū
- 5) LPC will prepare and implement a colour scheme for the Container Terminal cranes with a reflectivity value of less than 30%, and a colour palette of greens, and/or greys, and/or browns, and/or purple/blues. These should be recessive and harmonious with the landscape backdrop.

7.5.5 Conclusion

The Recovery Plan proposal avoids areas of identified outstanding natural character and natural landscapes. The anticipated visual and landscape effects of the proposed Lyttelton Port Recovery Plan are likely to be positive on balance for the Lyttelton Township, while having some adverse visual effects on the natural character and landscape of the Outer Harbour area.

The proposed expansion of the Container Terminal (and associated reclamation and quarrying) is likely to have the greatest visual and landscape impact on the Harbour. The proposed landscape rehabilitation and restoration recommendations in this assessment would assist with softening and integrating the Recovery Plan into the natural landscape and seascape setting around Gollans and Te Awaparahi Bays.

In the context of the existing Port infrastructure, the separation distances from most residential areas, the recommended mitigation, restoration and rehabilitation measures, as well as the positive benefits to the well-being of many local (and regional) people, the implementation of activities in the proposed Recovery Plan would not be inappropriate development in this harbour landscape.

7.6 Urban design effects

This discussion on urban design is based on a report prepared by Boffa Miskell Ltd titled "*Lyttelton Port Recovery Plan, Urban Design Assessment*" (October, 2014). This report is attached as Appendix 11.

7.6.1 Existing environment

From an urban design perspective, the Port's urban form has responded to the operational needs of the Port over time, with the outcome being that of a working port that displays an active industrial character in terms of the buildings, activities, and landscape. This has informed the character of the coastal (formalised) edge of the town and historic reclamation of land has occurred to create areas of flat industrial and storage land. Norwich Quay, as a State Highway, and the railway land separates the town centre from the Port/Dampier Bay, combined with a

change in levels created by the historic water's edge/ terrace and an associated large retaining wall or bank. This has resulted in public access to the Port being generally limited to the Naval Point area and the Diamond Harbour ferry terminal, with physical restrictions on public access to operational areas due to health and safety and security concerns.

Buildings and structures within the Port are dominated by the existence of a range of port-related uses, including the marina and boat access area at Naval Point, fuel unloading and storage facilities at the "Tank Farm", the dry dock, inner harbour recreation marina, ship berthing and unloading areas and associated equipment and cargo and container port equipment, including large cranes and storage areas.

Since the 2010/2011 earthquakes the Port has been severely damaged removing the full use of many areas of piers and wharves. Visiting cruise ships have ceased to berth at Lyttelton Port and the capacity to handle cargo has likewise been reduced. This has left some areas appearing abandoned due to damage preventing the active and ongoing use of such areas.

Specifically within the Dampier Bay area are a small number of ancillary buildings utilised by LPC, and including the Dampier Bay marina building and a small marina. The Lyttelton Engineering building just to the south of Dampier Bay is a prominent building and the largest in this area of the Port. This is due to its height of 15m and expansive footprint. The buildings in the area are predominately constructed in iron or timber and have pitched roofs. Some have a domestic appearance albeit they are used for marina activities. Most adopt a maritime colour scheme comprising blue and white or grey. Large areas of Dampier Bay are used for storage of materials and/or freight, car parking for staff and some areas are disused and appear as vacant, untidy gravelled areas.

There has been considerable public feedback through the Lyttelton Town Centre Master Plan and Lyttelton Port Recovery Plan consultation processes about the importance of the water and the opportunity to achieve improved connections between the township and the water front, including developing individual yet complementary urban identities of the Port in the Dampier Bay area and the Lyttelton town centre. The Port Lyttelton Plan (PLP) contains the Port's vision for a staged recovery of the Port to promote additional freight handling capacity by relocating the Container Terminal to a proposed additional reclamation in Te Awaparahi Bay at the eastern end of the existing Port and to provide for greater public access to the Inner Port. As part of the plan, the vision for Dampier Bay is 'to create an engaging and vibrant waterfront with public access and connectivity between Lyttelton, the Inner Harbour and the creational areas of Naval Point'.

7.6.2 Implications of the LPRP

The anticipated urban design effects of the proposed Port Lyttelton Plan are likely to be positive for the Lyttelton community, and key findings are that:

- The Dampier Bay site presents a significant opportunity to re-establish public access to the water.
- The site is in a strategic position to help start to bridge or integrate public access between the town centre and the waterfront.
- Future development of Dampier Bay has the potential to create a new destination for Lyttelton and wider Christchurch which draws on its unique cultural, historic and port context.
- Development of Dampier Bay will have a number of wide reaching benefits for the community and as sought by the Minister's Direction.

- There is a justifiable need to make improvements to Norwich Quay for pedestrians to address current amenity, connectivity and safety issues in order to support appropriate public access from the town centre to the waterfront.
- The proposed development will provide opportunities to link the site back into the existing transport network as well as introduce new linkages to the town centre and residential areas thereby improving the urban amenity and connectivity of the Port and town.
- The urban form is expected to change as a result of the Dampier Bay development given the potential for a greater range of uses, new buildings, car parking and roading.
- Should the Diamond Harbour ferry terminal be relocated to Dampier Bay, the location of the ferry terminal location should be developed in conjunction with public transport interchange facilities, supporting facilities and be within reasonable walking distance of the town centre i.e. close to No.7 Wharf and existing Sutton Quay access point onto Norwich Quay.
- The potential location of cruise ship berths should be considered in the context of promoting a new destination at Dampier Bay, supporting the existing town centre and in providing walking opportunities both within the urban area but also the wider recreational linkages.
- A broad range of land use is anticipated within Dampier Bay and although a finer grain of uses is desired this will likely be accompanied by an increase in intensification of business use in the area.
- Topography adjoining Port varies and this has an influence on determining the appropriate height limits for the development.
- Potential urban design risks or effects of future development could arise depending on how the development unfolds. These risks are focused around whether the development builds on the rich context to create a diverse and interesting place that is accessible and allows public access to the water's edge.

7.6.3 Proposed changes to the Rules in the District Plan

Urban design matters (activities and built form) are managed through the District Plan.

In order to safeguard against these potential urban design effects arising, a series of recommendations are made. These include:

- Development of an Outline Development Plan (ODP) for Dampier Bay;
- Development of an accompanying planning framework which includes urban design objectives and appropriate assessment for new development within Dampier Bay and adjacent to Norwich Quay, given the unique location of the site and context;
- Provides for a wide range of activities within Dampier Bay that are necessary for supporting a high amenity, publicly accessible, waterfront area;
- Enhanced landscaping along the inland edge of Dampier Bay to provide both amenity and to visually emphasise the original shoreline;
- Lower height limits in a portion of Dampier Bay; and

These measures are considered appropriate given the Port's character and cultural and historic context, likely possible use and in reflecting the values of the waterfront environment. The District Plan rule package is discussed in more detail later in the Lyttelton Port Recovery Plan.

7.6.4 Other methods

The intended outcomes of both the Port Lyttelton Plan and the CCC Lyttelton Town Centre Master Plan appear to be supportive of one another. Both Plans would result in significant improvements to the urban amenity of the town and the waterfront. A co-ordinated approach to the planning and the development of the area to achieve effective implications will be important in achieving good design outcomes, particularly the need for inter-agency cooperation in improving pedestrian amenity and linkages along and across Norwich Quay.

In addition to the regulatory controls provided through the District Plan, it is also proposed that LPC will prepare design guidance for Dampier Bay. The guidance would be provided to developers and designers involved in Dampier Bay. Such landowner-led guidance is a relatively common and established practice in commercial development, particularly in a Greenfield context (both residential and commercial), where the developer will produce their own set of 'in-house' controls to ensure development proceeds in a coherent and compatible manner.

The guidance would cover new buildings and the public realm, with the objective to reflect the historic and industrial character of the Port, including culturally significant sites and connections. Consideration would be given to building activation, location, height, size, materials (including recycled materials such as wharf timbers), form and colour, as well as signage, car parking, landscaping, public art and lighting. The design of public realm open space and roading/ walkway connections would also be included within the guide.

7.6.5 Conclusion

The existing port environment from an urban design perspective displays an industrial character reflective of the long-established port activities. The Port and adjoining road and rail corridors create a significant visual and physical barrier between the township and the waterfront. The recovery plan and associated ability to shift operational functions eastward and thereby release Dampier Bay for enhanced marina and publicly accessible space is a significant positive urban design outcome. To enable this outcome, it is important that the District Plan provisions provide for a range of activities within Dampier Bay, as well as ensuring that such development includes clear public access along the Dampier Bay waterfront and enhances connections between the waterfront and Norwich Quay (and thence the town centre). The combination of statutory controls proposed through the District Plan (Outline Development Plan and associated urban design assessments), and through other methods regarding multi-agency cooperation to improve the Norwich Quay pedestrian environment and through the design and layout of development within Dampier Bay, means that from an urban design perspective, the Recovery Plan will be effective in enabling improved outcomes for both the Port's recovery and for the wider township.

7.7 Transportation effects

This discussion on the implications of Port Recovery on the transport network and the use of public transport Effects is based on a report prepared by Abley Transportation Consultants Ltd titled "Lyttelton Port Recovery Plan, Integrated Transport Assessment" (October, 2014). This report is attached as Appendix 12.

7.7.1 Existing environment

Marine, logistics, storage and industrial activities are undertaken within the Port. Adjoining land is largely residential, with commercial activities concentrated in London Street. Naval Point as the only significant area of flat land in the vicinity contains sports fields, petroleum based storage and the tank farm.

From east to west through the town the main road is Norwich Quay (continuation of State Highway 74) leading to the main port access on Gladstone Quay. London Street connects with Sumner Road to the east.

Prior to the 2010/2011 earthquakes, Sumner Road provided the alternative port access for fuels and other dangerous goods that were not permitted through the tunnel. Dublin Street, Canterbury Street and Oxford Street incline up and away from the waterfront.

The closure of Sumner Road in February 2011 has resulted in dangerous goods and over-dimension loads being transported through the tunnel each day. NZTA states that such loads are only permitted to travel between 7pm and 6.30am, with the tunnel closed to other vehicles for the 6 to 10 minutes for each tanker to traverse the tunnel. Between 8 to 30 tanker movements occur each night.

The notified District Plan defines Norwich Quay and Tunnel Road (SH74) as 'Major Arterial Roads'. The stated function of such roads is to cater especially for longer trips, with a focus on transport efficiency. Norwich Quay forms the boundary (or barrier) between the Port and the Lyttelton Township. It is a State Highway and links the Lyttelton Tunnel with the main port access gates on Gladstone Quay. Norwich Quay also provides access to the town centre and the wider residential area.

Sumner Road, London Street to Dublin Street, the southern end of Dublin Street, Simeon Quay and Brittan Terrace are defined as Minor Arterial Roads. The stated function of such roads is to provide for movement functions and as such, these roads require the highest degree of movement function protection. The remaining road network consists of local roads, primarily functioning for access purposes.

Port access is primarily via the main security gate at the end of Norwich Quay which provides the predominant entry/exit point for operations on this side of the port; particularly for vehicular access to the container terminal and coal storage/handling areas. Access is also provided by the Sutton Quay access gates, and the Oxford Street overbridge. The petroleum based products, tank farm and activities around the dry dock are accessed via public roads including Simeon Quay and Godley Quay.

In addition to road links, the Port is connected to the Main South Line via a 12.6km rail spur that has its own tunnel through the Port Hills running parallel to the road tunnel.

Lyttelton's public bus service connects with the Diamond Harbour ferry and tourist ferries near the No.2 Wharf. The number 28 and number 535 bus services link Lyttelton with Christchurch, typically at 30 minute intervals during morning and evening commute times. On weekdays, the ferry service is mainly used by commuters from Diamond Harbour. On Saturdays, the principal use is to access Lyttelton market and for other shopping.

There are no specific cycling facilities in Lyttelton. Most of the streets in the town centre have footpaths on both sides. The only existing controlled pedestrian crossing of Norwich Quay is provided by way of zebra crossings at the intersection of Oxford Street.

The capacity and safety of Norwich Quay has been the focus of a number of previous studies. The Lyttelton Access Statement (LAS) is an initiative which responds to Action 40 of the Greater Christchurch Land Use Recovery Plan which is for 'a strategic freight network that provides for distribution and servicing needs of businesses ... while managing the effects on local communities'. The draft scoping report for the Lyttelton Access Project identified that the most feasible option for long term road access is to retain Norwich Quay with a focus on safety and amenity improvements in line with the CCC Lyttelton Master Plan (2012).

Measured traffic flows identify distinctive peak periods in the morning and evening during weekdays. The dominant traffic flow is towards Christchurch in the morning and returning to Lyttelton in the evening. The heavy vehicle traffic profile is flat throughout the day at about 20% of total traffic.

NZTA Crash Analysis data (2004 – 2013) identifies a total of 52 crashes, evenly spaced throughout the decade. In general, none of the crashes reported were due to a road environment safety deficiency. A recently modelled Christchurch City Council crash analysis for the road network reveals that the risk of a serious/fatal injury crash at intersections in Lyttelton is low.

The performance of the existing network during the peak hours and the corresponding level of service have been calculated based on surveyed flows. The network operates with a good level of service for the base year (2006). Modelling of key intersections identifies that the right turn from Chapmans Road onto Port Hills Road experiences higher delays in the peak periods, but remains within an acceptable operating range. All other intersections are operating well with minimal delays on all approaches.

7.7.2 Implications of the LPRP

Identified changes to the network include the reopening of Sumner Road by the CCC to its pre-quake level of service by the end of 2016. Environment Canterbury is proposing changes to the public transport network, with a reduced No. 535 bus service between Lyttelton and Eastgate and no proposed changes to the existing route and frequency of the ferry and No. 28 bus service.

Port Recovery will consist of many projects involving repair, rebuilding and reconfiguration works which ultimately result in the moving east of port operations in a timely manner. Commodity tonnage is also forecast to increase by 32% by 2026 and then almost double the 2013 tonnage by 2041.

The Diamond Harbour Ferry terminal will be relocated to a location adjacent to Wharf No.7. Timing for the relocation is likely to occur in the short – medium term (5 – 7 years).

Port freight growth and development at Dampier Bay have been assessed in terms of the anticipated effects on the local Lyttelton network as well as the wider strategic road network. Future years of 2026 and 2041 have been assessed assuming lower bound and upper bound freight scenarios and staged development of Dampier Bay. Traffic generated from construction activities and the mixed use development at Dampier Bay has also been included in the modelling.

The Lyttelton road network is shown to operate effectively until at least 2026 under the current transport layout with all links and intersections operating with acceptable delays. In particular, State Highway 74 (Norwich Quay) will continue to provide road transport access to the Port as its primary function. However improvements are recommended in the shorter term to support access to the Lyttelton Township as well as walking and cycling access, safety and amenity along and across Norwich Quay to reach the waterfront and Dampier Bay.

Post 2026 and depending on the level of freight and implementation of the Dampier Bay development, the Lyttelton road network will reach capacity if the existing infrastructure arrangements are maintained. Operational improvements to Norwich Quay including intersection modifications and possibly changes to the road space allocation will extend the performance of this corridor.

7.7.3 Proposed changes to the rules in the District Plan

Transport effects are typically managed through the District Plan through a requirement to undertake an Integrated Transport Assessment for high trip generating activities. The current transport provisions in Chapter 35 of District Plan (Banks Peninsula Section) exclude the

requirement for an ITA for developments involving "Traffic using the existing accesses from the Lyttelton Port Zone onto State Highway 74".

The Abley Assessment represents a comprehensive ITA for the Recovery Plan. The assessment concludes that the Lyttelton road network is shown to operate effectively until at least 2026. Further requirement for an ITA for individual projects would be inappropriate, and disjointed in terms of identifying transport impacts. The current provisions, excluding the requirement for individual ITA's for development in the Port Zone can be retained.

Recommendations that do require provisions in the District Plan include:

1. Inclusion in the Outline Development Plan (ODP) for Dampier Bay and its accompanying framework provisions:
 - (a) identifying in the ODP a permeable network of access points and vehicle access to Dampier Bay linking Godley Quay, and ultimately Sutton Quay connecting the ferry terminal, public transport interchange and other development;
 - (b) the delivery of parking to support Dampier Bay as it is developed;
 - (c) assessment matters for consideration of safe walking routes between the ferry wharf, waiting areas and bus stops, as well as sufficient space for buses to safely manoeuvre into and out of the bus stops.

7.7.4 Other methods

The intended outcomes and improvements in terms of network amenity and efficiency can only be achieved through LPC advocating for improvements from NZTA and CCC for their assets, including Norwich Quay.

A co-ordinated approach to the planning and the development of the transport infrastructure, facilities and networks will achieve effective integration of Port operations with Lyttelton Township. This will be important in achieving good amenity and transport outcomes, particularly the need for inter-agency cooperation in improving pedestrian amenity and linkages along and across Norwich Quay.

In addition to the regulatory controls provided through the District Plan, it is also proposed that LPC will advocate to the responsible Agency for the following works:

1. Port Hills Road / Chapmans Road Traffic Signals: 2015 – 2020. Responsibility NZTA / CCC. The existing intersection requires upgrading to traffic signals to accommodate the forecast increase in traffic volumes.
2. Public Transport access: 2020 onwards. Responsibility CRC / CCC. A high quality public transport interchange facility should be provided for passengers interchanging between ferry and bus services.
3. Improved pedestrian and cycle access between town centre and Dampier Bay: 2020. LPC. Walking / cycling access along the waterfront connecting Sutton Quay with Godley Quay.
4. Improved pedestrian and cycle access between town centre and Dampier Bay: 2020. NZTA, CCC and LPC. Provision of high quality walking/connection between Canterbury Street, along Norwich Quay and on waterfront side of Sutton Quay to support development of Dampier Bay including ferry terminal, marina and public waterfront access. This should include a signalised crossing of Norwich Quay at or close to Canterbury Street and a priority controlled crossing of Sutton Quay near Norwich Quay.

5. Norwich Quay (SH74) improvements: Post 2026. NZTA / CCC. A potential package of improvements to Norwich Quay includes controlled intersections at Canterbury Street and Oxford Street; additional circulating width at the Tunnel Road roundabout; capacity improvements at the Sutton Quay approach to Norwich Quay; safety improvements at Dublin Street and other modifications to the corridor to protect the primary function of the State Highway to provide the road transport access route to the Port.

7.7.5 Conclusion

The recovery of the Port, including its repair, rebuild and reconfiguration needs as well as Port freight growth and development at Dampier Bay have been assessed in terms of an integrated transport assessment. The ITA considers both the anticipated effects on the local Lyttelton network as well as the wider strategic road network.

In terms of the wider network, the Brougham Street corridor, and the Port Hills Chapmans Road intersection are under pressure, and require intervention before 2026. The obligation to resolve these issues lies with Agencies other than LPC.

The Lyttelton road network is shown to operate effectively until at least 2026 under the current transport layout with all links and intersections operating with acceptable delays. In particular, State Highway 74 (Norwich Quay) will continue to provide road transport access to the Port as its primary function. As such it is considered that the Recovery Proposal can be implemented as planned to 2026 without any further transport assessment.

Within the Outline Development Plan (ODP) for Dampier Bay and its accompanying framework provisions, a number of measures are recommended to optimise transport integration and accessibility, particularly in terms of providing a permeable network of access points and vehicle access to Dampier Bay connecting the ferry terminal, public transport interchange and other development

It is recommended that appropriate agencies note the various transport infrastructure requirements and plan for the implementation of these improvements at the appropriate stage.

7.8 Hydrodynamics – Effects on currents and waves

The Recovery will potentially include the:

- Construction of up to a 37ha reclamation in Te Awaparahi Bay;
- The deepening and widening of the current navigation channel and swing basin and berths to enable access of these larger vessels;
- The removal of Z-Berth to enable a cruise berth to be located in the Inner Harbour or the construction of a cruise berth south of Naval Point in the outer harbour; and
- Construction works in the coastal marine area to repair or rebuild or reconfigure the Port.

The waves, tidal currents, sedimentation regimes and the generation of turbidity plumes were examined in light of these potential works.

This discussion is based on the reports prepared by the following experts:

- Implications of the Lyttelton Port Recovery Plan on Waves and Tidal Currents in Lyttelton Harbour, Mulgor Consulting Ltd, 2014 (November 2014); (Appendix 13)
- Implications of the Lyttelton Port Recovery Plan on Sedimentation and Turbidity in Lyttelton Harbour, OCEL, Consultants Ltd (November 2014); (Appendix 14) and
- Implications of the Lyttelton Port Recovery Plan on Marine Ecology in Lyttelton Harbour, Cawthron, (November 2014) (Appendix 15).

7.8.1 Existing environment

7.8.1.1 Tidal currents in Lyttelton Harbour

The tidal currents in Lyttelton Harbour are considered to be relatively low in speed and as a consequence the water travels only up to about 3.5km on each incoming or outgoing tide. This means that Lyttelton Harbour is made up of three tidal compartments and the approximate locations for the tidal compartments are shown in Figure 7.1.

The compartments shown on Figure 7.1 are an approximation however because there are no fixed boundaries to the compartments and, in any event, it depends on where the tidal trajectory starts from. Therefore, while somewhat arbitrary, it does assist in the understanding of the harbour tidal regime. Assuming a ratchet type advance with no backward movement, an incoming water particle would take more than three days to get from the Heads of the harbour entrance to the top of the harbour.

This does not mean that water does not interchange between each of these tidal compartments, but rather many several tidal cycles will occur for the bulk of the water from the upper reaches to leave the harbour system altogether.

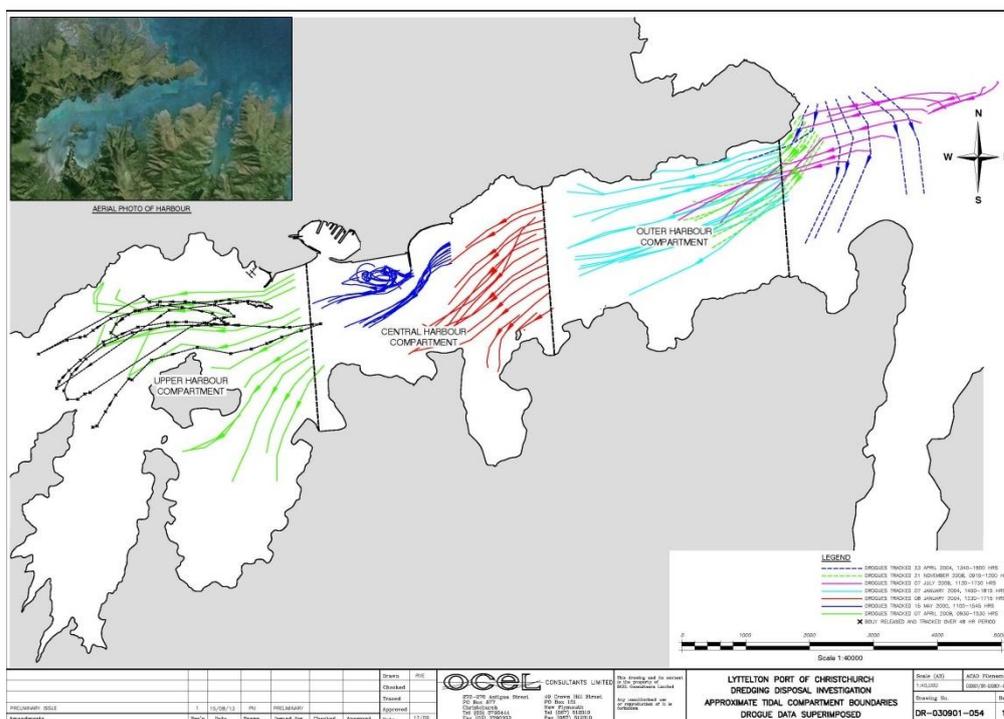


Figure 7.1: *Approximation of the three compartments in Lyttelton Harbour derived from drogoue results. Drawing provided by OCEL Consultants NZ Ltd.*

The largest tidal current speeds in the harbour occur around the ends of the Cashin Quay and Naval Point breakwaters²⁸ and in the Head of the Bay where the water is shallow. Relatively large currents also occur at various places around Quail Island. This occurs because the island displaces the tidal flow, causing the flow to speed up as it passes around the obstruction

²⁸ An ebb flow of up to 1 knot has been measured in the upper harbour between the Naval Point reclamation and Shag Reef.

7.8.1.2 Waves

Waves within Lyttelton Harbour fall into two groups. The first are swell waves which are generated from storms to the north-east that propagate waves directly into Pegasus Bay and also from storms in the southern ocean which refract around Banks Peninsula, The second are locally derived wind-generated sea waves.

The swell waves at harbour entrance are at their highest but fall off rapidly until about 6km from the entrance when their heights become comparatively small.

It is the waves that pick up sediment off the seabed and entrain it in the water column and it is this sediment that gives the seawater its cloudy or turbid appearance, and hence gives the harbour its characteristic aquamarine colour.

In essence, the swell waves have more energy and can reach further down into the water column than a sea wave. It means that at outer harbour, where the depth is 12m, the larger swell waves have the ability to disturb the bottom and mobilise sediment whereas the sea waves cannot. However, in the shallower upper harbour the sea waves can reach the bottom and mobilise sediment. Given the swell waves peter-out further up the harbour, then it is the wind waves from a south-west or strong easterly that discolour the upper harbour.

The tidal currents are not strong enough in Lyttelton to pick up sediment of the seabed. Rather the waves pick up the sediment which is then moved by the tidal currents.

7.8.2 Implications of the Lyttelton Port Recovery Plan

As the design of the reclamation (including the exact area requirements) and configuration of the port is still being progressed, a number of scenarios were modelled. This provided a way to understand how different sizes and layouts of reclamation change the waves and tidal currents. The scenarios provide a way to test the harbours sensitivity to different reclamation sizes and also different widths of the navigation channel.

Specifically, three reclamation and navigation channel scenarios were developed to compare with the environment as it exists today:

- Scenario 1:
A 33 ha reclamation out to 50 m from the end of the existing Cashin Quay breakwater (750 m wide) and a 180 m navigation channel dredged to a depth of 17.5 m below MSL;
- Scenario 2:
A 37 ha reclamation that extends out to the end of the existing Cashin Quay breakwater (750 m wide) and a 220 m wide navigation channel dredged to a depth of 17.5 m below MSL;
- Scenario 3: Scenario 2 with breakwater:
A 37 ha reclamation that extends out to the end of the existing Cashin Quay breakwater (750 m wide), with a 200 m long breakwater and a 220 m wide navigation channel dredged to a depth of 17.5 m below MSL;

Scenario 3 is not part of the recovery proposal but it is important to test each side of the proposed 37ha reclamation envelope to provide a better understanding of how the waves and tidal currents respond.

The model was also run with a 37ha reclamation (Scenario 2) but without any deepening of the navigation channel.

The plans showing the various scenarios are attached in report prepared by Mulgor Consulting Ltd.

Two other scenarios were also examined. The first is the removal of Z-berth that forms part of the entrance to the Inner harbour so as to enable cruise ships to berth at Gladstone Quay in the Inner Harbour. The second is dredging of berth pocket and swing basin to serve a new outer berth (originally considered for a cruise berth or an oil berth) combined with the removal of Z-Berth. Of interest was the degree to which the waves and tidal currents changed in the Inner Harbour with the partial opening up of its entrance.

7.8.2.1 Waves

The results of the three reclamation and channel scenarios are that there will be changes in the wave climate at some places in the harbour. Within a few hundred metres of the reclamation the wave heights will decrease as a result due to a redirection of wave energy caused by the reclamation and the deepening of the swing basin. Along the northern and southern bays on the flanks of the deepened shipping channel, wave heights will increase as a result of refraction. Most of these changes will be small in absolute terms. In the upper harbour and in Port Levy, the changes will be insignificant.

The conclusion is that the differences between Scenarios 1-3 are generally small and this illustrates that the changes are not particularly sensitive to the overall scale of the reclamation.

The proposed reclamation would affect swell waves more than sea waves. In the upper harbour, the swell waves are already small, so the reduction will have no significant effect. However, out from Diamond Harbour the swell waves are a significant proportion of the wave climate, and the reduction in the swell wave height by more than 39% in this locality suggested there will be a reduction in the amount of time the sediment is disturbed by the waves, and hence the area may shift to one that is more depositional in character.

However, when wave statistics were examined in further detail it became apparent that sediment on the seabed will still be entrained at a sufficient frequency. In addition to this the seabed is generally firmer in this area. This means the sediment is comparatively easily entrained into the water column. The overall conclusion is that there would be no significant change to the erosion regime at Diamond Harbour. In other words, any sediment that drops out of suspension in this location will continue to be swept away.

Wave activity along the northern and southern bays east of the reclamation was also examined to see whether any increased beach erosion would occur as a result of wave refraction from the deepened channel. It is predicted that Scenarios 1 and 2 would see an increase in wave height of more than 30% and more than 20% for Scenario 3. For sandy beaches, such increases would be expected to result in a significant effect on the transport of sediment along the beach; however, for these rocky bays such an increase is unlikely to cause significant erosion, noting that fines do not settle anyway in these comparatively high energy environments.

7.8.2.2 Tidal currents

The tidal currents will decrease for all three scenarios in the vicinity of the reclamation and increase along the north-western shorelines from Cass to Governors Bays. Elsewhere, there will be no significant change. Under Scenario 3, which is the full 37ha envelope plus a breakwater, the currents in the vicinity of the breakwater will decrease to less than half of existing levels.

The effect on sediment transport of changes in the tidal currents will be small, even in Diamond Harbour where a decrease of 9% in the flood-tide currents will occur. Under all of the scenarios, sediment transported in and out of Charteris Bay on the tide will be slightly different from the present in that it will reach the northern side of Quail Island sooner than it does at present.

The biggest difference predicted to occur is when the 37ha reclamation is established without any deepening of the navigation channel and the ship-turning basin. If this scenario were to eventuate the model predicts a marked increase in current speed, particularly beside the reclamation, at Naval Point, and in the high-flow region southwest of Quail Island.

The reason for this increase in current speed is thought to be due to flow acceleration and deflection around the reclamation, which also induces some cross-harbour flow. While the percentage increase in the current speed is marked in some locations²⁹ the speed of the currents are low, less than 0.3m/s in most places in the harbour.

As described earlier, if the navigation channel and ship-turning basin are deepened, then this predicted increase in speed would fail to eventuate because the flow has more depth and so the current speed drops.

7.8.2.3 Removal of Z-Berth

The removal of Z-Berth from the Inner Harbour entrance would more than double the waves in the Inner Harbour although the change would still be low in absolute terms (less than 6cm). Likewise the the tidal currents in the Inner Harbour will more than double, though again would be low in absolute terms.

7.8.2.4 Turbidity plumes from construction works and dredging

The most significant turbidity plumes are expected to be produced by dredging reclamation, and excavation. However, smaller plumes can be expected from construction of new wharves and the repair of existing wharves, all of which involve the sinking of piles.

The scale and duration of dredging and excavation work required for most projects is unlikely to eclipse that of annual maintenance dredging. The possible exception to this might be the dredging of an expanded swing basin to the south of Naval Point in order to accommodate a cruise ship berth.

Monitoring during the construction of the 10ha reclamation work in Te Awaparahi Bay, which involves end tipping and placement of earthquake rubble, indicates that turbidity plumes are likely to be quite localised to the area of construction. It is recognised however that the detailed reclamation design will need to factor the potential for fine sediment escape if either loess or marine fill is used.

Turbidity plumes in any event are known to be self-limiting because the greater the concentration of suspended sediment in the water column, the faster the sediment will settle out. This is due to density-related turbidity currents and increased particle collisions resulting in formation of floccs which then settle out at a faster rate.

As described earlier, Lyttelton Harbour is a naturally turbid environment and so a turbidity plume only causes a transient spike of suspended sediment in the water column before becoming indistinguishable from background turbidity. The conclusion is that the generation of turbidity plumes associated the Recovery is not predicted to be significant.

7.8.3 Proposed changes to the RCEP

The work on waves and tidal currents and associated sediment transport in the harbour establishes that a 37ha reclamation in Te Awaparahi Bay will not change these physical processes significantly. This is further confirmed by the sensitivity testing carried out by both increasing and

²⁹ See Table 4.3a of the Mulgor Report.

decreasing the size of the footprint and also testing the cumulative effects of a deepened navigation channel of two different widths.

The largest change would occur if reclamation proceeded without any channel deepening. This results in a marked increase in the tidal current speeds. However, the existing current speeds are low and the predicted increases will still mean it will take many tidal cycles for the bulk of the water from the upper reaches to leave the harbour system.

The consequence of the results means that the current sedimentation regime in the Harbour would not change and the rates of sedimentation occurring in the upper harbour would not be exacerbated. Therefore, in principle the activity status of the reclamation can be changed from a discretionary activity as it is currently in the RCEP to a controlled activity.

However, the implications of the proposed reclamation on marine ecology, mahinga kai, and on marine mammals also need to be examined, as discussed in the next section.

Turbidity plumes generated from construction work will be insignificant, particularly in the context of a naturally turbid harbour, noting turbidity plumes are routinely generated from maintenance dredging and also propeller wash in the Operational Area of the Port. As a consequence there is no reason to monitor or manage the turbidity plumes during construction with two exceptions. The first is during the construction of the proposed reclamation given there will be persistent plumes for a relatively long period (the consent reclamation currently being constructed uses a silt curtain for example).³⁰

The second is in areas of the Inner Harbour where there could be elevated levels of contaminants in the sediment. In this case an environmental management plan prepared by LPC will set out the procedures to survey seabed subject to the proposed construction works to determine the levels of contamination in the area and whether any measures are required to manage any turbidity plumes.

7.8.4 Conclusion

The most significant conclusion is that a 37ha reclamation in Te Awaparahi Bay will not change the wave climate or the tidal currents, and hence the transport of sediment, significantly. This means that the current sedimentation regime in the Harbour would not change and the rates of sedimentation occurring in the upper harbour would not be exacerbated, which is a very important issue for the community.

The other conclusion is that turbidity plumes generated from construction work will be insignificant, although it is anticipated that persistent turbidity plumes associated with the construction of the proposed reclamation would need to be managed, and turbidity plumes generated from the disturbance of contaminated sediment in the Inner Harbour would also need to be managed.

7.9 Effects on marine ecology including marine mammals, kaimoana and the introduction of invasive species

The Port Recovery will consist of repair, rebuild and reconfiguration works that affect the coastal marine ecology, including marine mammals and kaimoana. It may also increase the risk of the

³⁰ Refer to new Rule 10.25 of the RCEP in Appendix 29.

introduction or spread of invasive species. This discussion on marine ecology and the implications of Port Recovery are based on reports prepared by the following experts:

- Implications of the Lyttelton Port Recovery Plan on Marine Ecology in Lyttelton Harbour, Cawthron, (October 2014); (Appendix 15)
- Marine Mammals and Port Lyttelton Development, University of Otago (October 2014) (Appendix 16);
- Lyttelton Harbour/ Whakaraupō a Mahinga Kai and a Working Port, Tonkin and Taylor (October 2014) (Appendix 17); and
- Lyttelton Port of Christchurch Earthquake Recovery Plan: Assessment of Marine Biosecurity Risks, Cawthron (September, 2014) (Appendix 18).

7.9.1 Existing environment

The seafloor both in Pegasus Bay and Lyttelton Harbour is typically composed of uniform semi-consolidated mud which lack any hard substrate features. As a consequence the communities that live on the seabed (benthic communities) tend to be sparse with quite low species richness, often having a numerical prevalence of polychaete taxa as well as taxa such as ostrocods, crabs and cumaceans.

The species are typical of a dynamic soft-bottom seabed environment and are tolerant of high suspended sediment levels. These species are able to recolonise suitable habitats relatively quickly, either through larval recruitment or migration.

The benthic communities within the Port Operational Area are reported as having a lower diversity which is at least partly due to disturbance that occurs due to dredging and propeller wash from vessels for example.

The intertidal zone in Lyttelton Harbour and its Heads is again characterised by taxa that are common throughout the region. The upper shoreline is marked by abundant tubeworms and barnacles as well as periwinkles, limpets, chitons and cat's eye snails. In the mid-shore zone, mussels, oysters and algae become more prevalent. The low-shore areas are characterised by the taxa in the mid-shore zone although sponges and tunicates begin to occur and the diversity of algae increases.

Nevertheless, Lyttelton Harbour has a number of features and areas of ecological value. These include:

- The fringing reefs of the outer heads;
- The salt marshes and tidal flats of the upper Harbour which support a range of wading birds and waterfowl and are likely to represent nursery grounds for a number of fish species;
- Rare brachiopods in Lyttelton Harbour with three species occurring together at Ripapa Island, meaning the island is considered an area with significant natural value.

The most notable marine mammal in the area is the rare and endangered Hector's dolphin/upokohue (*Cephalorhynchus hectori*). Banks Peninsula has a relatively large population with approximately 1100 of these individuals. The greatest densities of dolphins along the northern bays of Banks Peninsula occur between Baleine Point (the eastern-most headland of Port Levy) and Stony Beach (just west of Okains Bay) although the highest densities in all of Banks Peninsula are found in the eastern bays. Hector's Dolphin frequent Lyttelton Harbour all year round, although the numbers sighted are highest in spring and summer.

A Banks Peninsula Marine Mammal Sanctuary was created under section 22 of the Marine Mammals Protection Act 1978 around Banks Peninsula in 1988 to protect Hector's Dolphin from

being caught in set nets. The sanctuary was extended in 2008 and now extends from the Waipara River to the Rakaia River, and out to a distance of twelve nautical miles. Seismic surveying work is also controlled within this area.

Other infrequent transient dolphin species along the coast include the cosmopolitan common dolphins, bottlenose dolphins, dusky dolphins, and orca.

With respect to Pinnipeds, small populations of New Zealand fur seal (*Arctocephalus forsteri*) can be found around many of the headlands of Banks Peninsula and the occasional sighting of the leopard seal (*Hydrurga leptonyx*) has been reported. The New Zealand fur seal in general has shown recovery around New Zealand and Australia. There is a breeding colony of fur seal at Long Lookout point, approximately 20 km from the entrance to Lyttelton Harbour and also non-breeding haulouts may occur along the coast around Lyttelton Harbour and foraging seals have been found inside the Harbour.

A range of seabirds is found in the Harbour, including Pied Cormorant (*Phalacrocorax varius*), Spotted Shag (*Stictocarbo punctatus*), (Black-backed Gull (*Larus dominicanus*), Red-billed Gull (*Larus novahollandiae*), Variable Oystercatcher (*Haematopus unicolor*), White-fronted Tern (*Sterna striata*), the White-faced heron (*Ardea novahollandiae*) and the occasional sooty shearwater/tītī (*Puffinus griseus*). The sea cliffs at Scarborough and Godley Head are important roosting habitats for these birds. In recognition of the cliff habitat, and also the presence of the New Zealand fur seals on the headland rocks, as well as their scenic values, the coastal marine area around these headlands is identified as an area of significant natural value.

Since predator control was carried out on Quail Island, a breeding population of White-flipped Penguin (*Eudyptula minor albosignata*) has established. The White-flipped Penguin is currently considered a subspecies of the Little Penguin and is largely endemic to Canterbury and breeds only on Banks Peninsula with some 2,200 pairs, and also on Motunau Island with some 1,800 pairs.

Whakaraupō has a rich history of Ngāi Tahu land use and occupancy, and a strong mahinga kai tradition. Kaimoana provided an abundant and reliable supply of food for tāngata whenua and their visitors. The restoration of kaimoana values to Whakaraupō is a key principle for the kaitiaki Rūnanga in this catchment.

A total of thirty-eight different kaimoana species have been identified as important to Whakaraupō/Lyttelton Harbour. This included 14 types of shellfish, an octopus, a sea tulip, a seaweed, and twenty-one species of finfish. As mentioned in Section 1, Rāpaki are seeking a much larger Mātaitai reserve for the upper half of the Harbour for customary fishing purposes.

Surveys in 2002 and 2004 at the Port identified a total of 27 exotic marine species. Two of these species, the Asian kelp *Undaria pinnatifida* and the ascidian *Styela clava* are designated as unwanted organisms. In 2008 the Mediterranean fanworm *Sabella spallanzanii* was detected on a wharf pile. An effort to eradicate *Sabella* was initiated but abandoned after the discovery of it in Waitemata Harbour. More positively, *Sabella* has in recent times at the Port been recorded in progressively lower abundances.

7.9.2 Implications of the Lyttelton Port Recovery Plan

The proposed reclamation will represent a loss of approximately 0.7% of the total benthic area of Lyttelton Harbour (approximately 4,180ha) if the full envelope is developed. However, it is considered that the displacement of this area would be expected to have very little effect on the functioning and productivity of benthic ecosystems in Lyttelton Harbour as a whole: previous survey work has indicated that the marine communities in Te Awaparahi commonly occur within the wider area of Lyttelton Harbour. Likewise, Te Awaparahi is not known to be a significant

feeding or spawning area for fish and any fish caught at this location are fairly wide-ranging in their habits (e.g. flatfish, red cod, and gurnard).

Battery Point is a rocky platform that separates Te Awaparahi Bay from Gollans Bay. Species of kaimoana have been recorded at Battery Point and Tangata Tiaki expects other kaimoana species will reside there. The reclamation is now proposed to avoid the western platform of Battery Point in response to concerns about the potential impact on kaimoana. Opportunities to enhance to offset the reclamation are also recommended.

There is unlikely to be any noticeable response of the marine communities to changes in the wave and tidal currents caused by the reclamation (see Section 7.9). If any change did occur it would be manifest as spatial shifts (up-harbour or down-harbour) in transitional areas between ranges of overlapping taxa.

It is also unlikely that there would be any contamination issues associated with the construction of the reclamation. Water testing for the consented reclamation currently under construction has not revealed any significant levels of contamination.

The effects of the other construction works associated with Port Recovery are unlikely to cause any significant impacts. The areas along Cashin Quay and in the Inner Harbour are heavily modified and frequently disturbed by shipping movements and maintenance dredging. While the area adjoining Naval Point is not subject to dredging, earlier marine ecological surveys revealed uniform soft muds with a significant degree of similarity between species sampled outside and inside the Inner Harbour.

Parts of the Inner Harbour however contain sediments with high levels of contamination. The dry dock historically did not treat its wastewater and as a consequence there are high levels of metal contaminants found in a zone around the dry dock. The proposed Dampier Bay marina for example would extend into this zone of contaminated sediments. Construction works in these areas would require careful management.

The most significant far afield ecological affect is likely to be on Hector's dolphin. Based on overseas research it is suggested that Port Recovery may affect Hector's Dolphin using Lyttelton Harbour through:

- The removal or disturbance to marine habitat reclamation and construction works;
- Exposure of contaminants from disturbed seabed material or fill used for reclamation;
- Dredging creating noise and elevated levels of contaminants in spoil;
- Contaminant runoff from land and the potential for oil or fuel spills.

The most significant risk however appears to be from underwater noise generated from the piling operation. This may result in some dolphins moving away from this part of the Harbour and could physically impair their hearing if a dolphin was in the vicinity when pile-driving commenced.

Potential disturbance or mortality from effects such as piling noise and ship strike may also cause a displacement of the Hector's dolphin population that uses Lyttelton Harbour. Because fur seals are not commonly found in the harbour the potential effects on them is considered less significant although risks around noise injury or vessel strike still remain.

Various mitigation measures are suggested for piling operations, including:

- Avoiding times when marine mammals are most likely to be in the area;
- Using experienced marine mammal observers before, during and after pile driving;
- Using bubble curtains to dampen noise;

- Using 'soft start' techniques to give animals an opportunity to vacate the area before sound levels increase.

It is also recommended that further detailed investigation be carried out to further quantify the effects on marine mammals before, during and after any port repairs.

Other general mitigation methods suggested include avoiding the removal of marine mammal habitat where possible, the use of silt curtains to manage turbidity plumes and to manage any contaminated sediment.

Port Recovery could increase the risk of exotic, invasive species entering the Harbour or spreading in geographic extent through:

- Introduction of new exotics through use of specialised vessels or equipment;
- Increase spread of established exotics during removal of infrastructure;
- Increased abundance of exotics from the construction of new artificial habitat;
- Increased spread of exotics via changed vessel patterns or activities such as dredging or changes in harbour hydrodynamics.

No recommendations are made on mitigation other than a vessel owner or operator of a specialised vessel prepares and submits a Marine Biosecurity Plan. However, the report suggests that LPC could carry out further investigations to establish the levels of risk of invasive species from establishing or spreading.

7.9.3 Proposed changes to the RCEP

The detailed design and construction of the reclamation and associated berth at Te Awaparahi Bay and the potential outer berth to the south of naval Point are proposed to be listed as controlled activity rules so conditions can be imposed on the various matters where relevant including:

- Detailed design;
- Methods to management sediment plumes and control stormwater;
- Measures to control spillages; and
- Methods to manage the effects of construction noise on marine mammals.

There is an expectation in the Cawthron report that measures to manage sediment plumes and control stormwater will be included in the Construction and Environmental Management Plan (CEMP) but individual consent conditions can be placed on these matters as necessary. Likewise there is an expectation in the University of Otago Report that mitigation measures will be put in place to reduce any potential impact to Hector's dolphin from the piling operation. These will again be addressed in the CEMP but individual consent conditions can be placed on these matters as necessary.

In addition, the preparation of a Kaimoana Management Plan, in consultation with Te Hapū o Ngāti Wheke and Te Rūnanga o Koukourārata, is also proposed to be completed prior to the commencement of any reclamation. The Plan would set methods to survey the status of kaimoana before and after reclamation, using Mātauranga Māori-based techniques, such as the Marine Cultural Health Index (MCHI), as well as investigating opportunities for kaimoana enhancement.

All marine based construction work will be subject to the CEMP. With respect to the Inner Harbour, the CEMP will set out how to manage contaminated sediment during construction works and during dredging. Depending on the levels of contamination, the propagation of turbidity plumes from the construction work areas using a silt curtain or other measures may need to be

implemented. Where dredge spoil is involved, additional monitoring at spoil deposition grounds may be required. (The existing spoil grounds on the north side of the harbour as shown on Planning Map 5.3 of the RCEP).

The deposition of dredge spoil at the spoil grounds would either be a controlled activity or a restricted discretionary activity depending on the volume involved but irrespective of these rules the discharge of spoil into the water column would continue to be classified as a full discretionary activity in the RCEP. Further assessments of marine ecological matters would be assessed as part of any application for a coastal permit under these rules.

As mentioned earlier, any sediment Inner Harbour that have elevated levels of contaminants will need to be assessed to determine whether the dredge spoil is suitable for unconfined sea disposal.

All discharges from land will be subject to Rule 10.1 which permits discharges subject to a range of narrative standards to ensure adverse effects on the environment are avoided or mitigated. This principle is a carry-over from the existing RCEP.

While the deepening of the port's navigation channel, ship-turning basin, and associated berths is part of the Port Recovery, the requirement for resource consents for the capital dredging project remain unchanged (as discretionary activities). This means again that detailed assessments and proposed measures mitigate any actual or potential effects on marine ecology would be addressed in that application.

7.9.4 Expert recommendations

As described above, the CEMP and the proposed rules (and associated conditions of future consents) will capture a range of issues raised and the recommendations contained in the expert reports.

However, there are also other recommendations for LPC to consider as part of Port Recovery i.e.

- The establishment of Mara Mātaitai (kaimoana gardens, with reseeding of chosen kaimoana species);
- Supporting future aquaculture developments associated with Te Hapū o Ngāti Wheke and Te Rūnanga o Koukourārata;
- Long-term monitoring programme to quantify habitat use, generation of local abundance estimates, and the estimation of survival rates of Hector's dolphin to help determine population level responses to the development activities;
- The examination of any marine mammal carcasses retrieved to try and determine whether the cause of death was related to piling noise, ship strike or high contaminants levels; and
- Investigations into reducing the risk of invasive species entering or spreading as part of Port Recovery including a requirement on owners or operators of a specialised vessel such as an overseas dredge prepare a Marine Biosecurity Management Plan.

LPC will need to further examine the recommendations to firstly determine their appropriateness, and, if so, when the recommendations are to be acted on.

7.9.5 Conclusion

Port Recovery is unlikely to cause significant impacts on the marine ecology in the vicinity of the port. The species in the vicinity of the port are typical of the wider harbour environs, characterised by a quite low species richness and typical of a dynamic soft-bottom seabed environment. Nevertheless, care needs to be taken in managing sediment plumes, particularly those from areas with sediments containing elevated levels of containments. A list of potential

impacts on Hector's dolphin based on research elsewhere has been documented and further mitigation and research is recommended. Opportunities to enhance mahinga kai have recommended as a means to off-set the proposed loss of habitat associated with the reclamation and further investigation to reducing the potential risk of bio-security incursions are recommended.

7.10 Management of Stormwater

The Recovery involves the discharge of stormwater from two distinct geographic areas. The first is the discharge of stormwater from the flat land at the Port from Dampier Bay around to Te Awaparahi Bay and the second is from the hillside above Te Awaparahi Bay and along to Gollans Bay.

Stormwater disposal from Naval Point is not addressed here because the City Council has a series of pipes and drains which collect stormwater from this area. Furthermore, some of the Oil Companies hold resource consents to discharge stormwater from some of the oil storage areas. The rule discussed later would not apply to Naval Point area.

The discussion of stormwater discharges into the coastal marine area from the Port's flat land is based on a report prepared by Cawthron in October 2014 and titled "*Implications of the Lyttelton Port Recovery Plan on Marine Ecology* (Appendix 15); while discussion of stormwater discharges from the hillside works is based on a letter from Lowe Environmental Impact (dated October 2014) and an earlier letter prepared by CPG NZ Ltd (dated July 2010). These letters are attached as Appendix 19.

7.10.1 Existing environment

As discussed in Section 7.9 the port marine environments are exposed to a variety of contaminants from a range of sources. In terms of stormwater, the contaminants types from Port activities vary in the main according to the cargo types being handled and to the level of vehicle use. Table 7.2 lists stormwater contaminant classes associated with various port activities.

There are no records of monitoring been carried out of stormwater being discharged from the container terminal area although LPC has monitored the stormwater discharges from the coal stockyard in Te Awaparahi Bay.³¹ The results of this monitoring show that the coal stockyard discharge is typical of port areas generally with PAHs and trace metals measured at low levels but above natural background levels.

³¹ Carried out under CRC960551

Table 7.2: Ubiquitous stormwater contaminants and their likely presence in runoff from individual Port activities.

1. Polycyclic aromatic hydrocarbons.
2. Biochemical, and chemical, oxygen demand, respectively.

	Light Vehicle Traffic	Heavy Vehicle Traffic	Car Park	Buildings/ roof runoff	Workshops	Fuel storage/ transfer	Container operations	Log/chip storage	Cement storage/ handling	Fertiliser loading
Trace Metals	✓	✓	✓	✓	✓		✓		✓	
Petroleum hydrocarbons	✓	✓	✓		✓	✓	✓			
PAHs ¹	✓	✓	✓		✓	✓				
Suspended solids	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
pH change									✓	
BOD & COD ²								✓	✓	✓
Nutrients										✓

The results of stormwater monitoring at the container marshalling yards at Port Napier also showed a similar suite of contaminants to that generally associated with urban stormwater i.e. containing both trace metals and hydrocarbons in concentrations above natural background levels. However, semi-volatile organic compounds (SVOCs, which include a number of pesticides and herbicides) were, for the most part, below analytical detection limits in the container yard run-off samples. The results from this monitoring work were considered to represent relatively low overall stormwater contaminant levels for the container marshalling areas.

With respect to the handling of bulk materials, LPC holds coastal permit (CRC960557) to discharge wharf stormwater and washwater that contains bulk cargo dust. The conditions of the permit require a number of methods to be undertaken to remove as much dust as practicable and also to avoid direct spillage into the water between the vessel and the wharf.

The hillside is a very different environment. Here it is largely under vegetation other than the quarry and associated roads or tracks. The contaminant of interest is sediment. In particular any areas containing substantial pockets of loess (fine silt material) need to be carefully managed because loess is easily entrained in stormwater and is a significant contributor to the suspended solids contained in stormwater during rainfall events.

7.10.2 Implications of the LPRP

The Port Recovery will consist of many projects involving repair, rebuilding and reconfiguration works which ultimately result in the moving east of port operations in a timely manner. This includes a substantial re-paving programme that will include a new stormwater collection system. It is anticipated that gross pollutant and hydrocarbon interceptors will be routinely installed as part

of this repair, reconstruction and reconfiguration programme. The detailed designs of these would be dictated on the type of cargo being foreshadowed for an area. Hydrocarbon interceptors would for example be more important at the container terminal whereas gross pollutant traps would be commensurately more important in log handling areas.

The proposed reclamation at Te Awaparahi Bay would lead to an increase in the quantity of stormwater being discharged to the near-shore marine area; however the increased volume is considered to be of secondary significance compared to contaminant loading. The area will be used for container operations and this cargo handling activity would arguably have relatively less impact on stormwater quality than those associated with bulk material handling such as logs, coal or bulk fertiliser.

Construction works at the port and the earthworks associated with the upgrade of the haul road and the quarrying operation would be subject to erosion and sediment control measures that are detailed in a sediment control technical chapter of the CEMP. These include:

- Avoidance measures e.g. staging of works, cut off drains, check dams;
- Treatment measures e.g. sediment curtains, straw bale barriers and sediment retention ponds; and
- Stabilisation measures e.g. hydroseeding and planting.

The haul road above Te Awaparahi Bay runs through an area which contains significant deposits of loess and so any upgrade will require careful management. A chemical dosing is recommended at the outset to enable the loess to settle. It is also anticipated that the quarrying would need to be staged in order to properly manage stormwater.

Part of stormwater management also involves other best practice controls such as:

- Sound-house-keeping practices with respect to large impervious surfaces, stockpiles and storage areas;
- Effective reporting of, and response to, spills;
- Bunding of high-risk areas for spills such as diesel storage tanks; and
- Dust suppression.

7.10.3 Proposed changes to the Rules in the RCEP and the PCLWRP

Stormwater discharges to the harbour are managed by the Regional Coastal Environment Plan (RCEP) while stormwater discharges to land are managed by the Proposed Canterbury Land and Water Regional Plan (PCWLRP).³²

Rule 7.1 of the RCEP currently permits a range of discharges into the coastal marine area subject to various conditions. As discussed in Section 9.2.2, it is proposed to amend the conditions so that the discharges are subject to a range of narrative standards after reasonable mixing.³³

The change to full narrative standards on the permitted activity stormwater discharge rule is not expected to change the current status of stormwater management at the port.³⁴ Stormwater discharged from the hard standing areas such as the container terminal is presumably expected to continue without need for a consent, while coastal permits to discharge stormwater from the coal

³² The PLWRP will replace Chapter 4 of the Natural Resource Regional Plan.

³³ Refer to new Rule 10.1 in Appendix 29.

³⁴ The proposed changes are in recognition of the inherent problem of placing numerical standards in rules for such a variable receiving environment.

stockyard and from the handling of bulk cargo with fine particles would presumably continue to be required unless monitoring demonstrated otherwise.

However, an additional pre-condition is proposed on the new stormwater discharge rule³⁵ that requires the installation of gross pollutant interceptors and hydrocarbon interceptors. The opportunity has arisen to install these mitigation devices on the port land as re-paving is completed as part of Recovery as discussed earlier.

With respect to hillside stormwater, Rule 5.95 of the PCLWRP again permits the discharge of stormwater subject to a number of pre-conditions. Many people are likely to obtain a resource consent as a matter of course because there will be usually doubt on whether the all the conditions of the permitted activity could always be complied with.

It is proposed to introduce a new rule that would permit the discharge of stormwater from land used for earthworks provided that the area involved is less than 500m² or 10m³ in areas where loess is present. Beyond this area threshold the discharge would be assessed as a controlled activity. The Council would reserve control matters such as the preparation of an erosion and control sediment plan and introduction of erosion and control sediment plan.³⁶

Quarrying and an upgrade to the haul road are already consented for to serve the current reclamation issued under the Order in Council, (CRC 111661 and CRC111662).³⁷ These consents however cannot be used for reclamation outside the current 10ha footprint under construction and so the new rule will enable a similar set of conditions to be imposed for these works.

There is also a new rule that permits the taking and diverting of clean stormwater around disturbed land as it is unclear whether this is permitted under the PCLWRP.³⁸

While not strictly a stormwater matters, the proposed changes to the site dewatering and excavation and deposition rules over an aquifer contained in the PCLWRP are discussed here. Rule 5.11 in the PCLWRP permits site dewatering subject to conditions to ensure site dewatering does not adversely affect any aquifers.

However, again many people are likely to obtain a resource consent as a matter of course because there will be doubt around whether the all the conditions of the permitted activity could always be complied with. It is possible that site dewatering maybe required when repairing or reconstructing the existing reclaimed land. The aquifer under the reclaimed land at the Port is not used by any person.

It is proposed to introduce a controlled activity rule that would enable LPC to obtain a consent if necessary and conditions would be expected to be imposed in the event that the dewatering process would require specific mitigation measures.³⁹

The excavation and deposition of material above an aquifer is addressed under Rules 5.175 to 5.178 of the PCLWRP. The rules are concerned about protecting the aquifer from contamination. As part of Recovery, LPC may excavate material during construction and deposit in areas previously excavated. It is proposed that two new rules be introduced that permit excavation and permit deposition subject to a standard that requires any material deposited within one metre of the water table to be cleanfill only.⁴⁰ This is appropriate because LPC has already obtained a global consent from the Christchurch City Council under the NES to disturb of contaminated soil

³⁵ Refer to new RCEP Rule 10.1(b) in Appendix 29.

³⁶ Refer to new RCEP Rule 10.1 (c) in Appendix 29 and new PCLWRP Rules 10A.2 and 10A.3 in Appendix 29.

³⁷ Canterbury Earthquake (Resource Management Act Port of Lyttelton Recovery) Order 2011.

³⁸ Refer to new PCLWRP Rule 10A.1 in Appendix 29.

³⁹ Refer to new PCLWRP Rule 10A.5 in Appendix 29.

⁴⁰ Refer to new PCLWRP Rules 10A.6 and 10A.7 in Appendix 29.

(RMA92025316) and because as noted earlier the ground water at this location is not used by any other person.

7.11 Effects on Navigation safety and marine spill risk

The discussion on the Navigation is based on a report prepared by Lyttelton Port Company titled "*Effects of Lyttelton Port Recovery Plan on Navigation Safety*" (November, 2014) which is attached as Appendix 20.

The discussion on the risk of marine oil spills is based on a report prepared by the Australian Marine Oil Spill Centre (AMOSC) titled "*Assessment of port changes to the risk of a marine oil spill occurring*" (November, 2014) attached as Appendix 21.

7.11.1 Existing Situation

Lyttelton Port Company (LPC) has policies and procedures in place to manage the navigation of vessels visiting the port and also responding to marine oil spills. These procedures are not however carried out in isolation; they are carefully coordinated with Environment Canterbury. This is because Environment Canterbury also has a statutory responsibility to manage these issues.

Environment Canterbury's policy is to keep Lyttelton Harbour open and clear for commercial vessels to visit Lyttelton Port for purposes of international and domestic trade. This includes maintaining clear passage for passenger transport and to minimise conflict with recreational craft.

LPC has documented practices and procedures in place to ensure safe navigation of vessels. Large vessels entering the Harbour are tug assisted and LPC piloted. It is noted that New Zealand Maritime School at Auckland is set up with bridge simulator to train pilots. The simulator has a range of vessel bridge types and controls for various ships including tug boats, cruise ships, container ships and bulk carriers.

The simulator has been used recently to test the feasibility of new berth designs and the associated approaches. The handling of large tankers and cruise vessels has also been simulated to understand the towage power required and any other restrictions.

In terms of marine spills, the coastal marine area running from the north of Christchurch down to Pigeon Bay has a very high oil spill risk rating from Maritime New Zealand because of the number of the vessels using the area and because of the receiving environment, including the fact that the area has high cultural values. The main risk of marine oil spill associated with the Port involves:

- Vessel accident (collision or grounding);
- Accident during unloading of oil tankers at the oil berth; and
- Accident during fuelling of vessels

Bunkering⁴¹ at Lyttelton is restricted however to smaller vessels i.e. fishing vessels. There is a tiered response in place in the event of a marine oil spill occurring i.e.

- Tier 1 - responded to and resolved by LPC.
- Tier 2 – beyond the capability of LPC and requires Environment Canterbury to lead the response. LPC would still assist.
- Tier 3 – requires central government assistance due to the scale of the spill.

⁴¹ The loading of fuel, water and food to serve a vessel is collectively called bunkering.

The tiered approach is recognised and used internationally.

7.11.2 Implications of the PLRP

The port's recovery will result in an increased number of vessels visiting the port and in general these vessels are expected to get larger.⁴² However, this is not expected to cause any additional navigation risks because the larger vessels will continue to be piloted.

The increased number of small craft using the proposed marina will increase the potential risk of accidents. A detailed communications package is to be provided to all berth holders ensuring all users are aware of restrictions, how they should act in certain circumstances and what to be aware of. In addition, shipping schedules will be made available at berths. The moving of the some of the break bulk vessels⁴³ out of the Inner Harbour will however be beneficial.

The establishment of a cruise berth south of Naval Point should not present an increase in navigation risk although it is noted that these vessels are large vessels (up to 350m long) and will require some degree of manoeuvring to berth off Naval Point. A berth in this location would also necessitate the need for a change to starter buoys for yacht racing to ensure the ongoing safety of yachtsman.

The increase in the size of vessels will mean their fuel tanks are larger and consequently the risk of a larger marine oil spill increases. However, it is also noted that the new vessels usually have greater safety margins built into them. For example, vessel fuel tanks are now not mounted to the hull, and in the case of tankers they are now double-hulled.⁴⁴

It is noted that there is a potential increase in the risk of a larger vessel being grounded unless navigation channels are deepened and widened to accepted standards. Part of Port Recovery involves deepening and extending the navigation channel, ship-turning basin and berths, which means this risk should not increase.

The response plans are considered robust subject to some minor amendments but it is recommended that both the Tier 1 and Tier II oil spill response plans be reviewed in future to incorporate the changes to the configuration of the Port etc. as Port Recovery progresses.

7.11.3 Proposed Changes to the Provisions

A number of the rules proposed in the Regional Coastal Environment Plan enable conditions to be imposed on how any bulk hazardous substances are conveyed from a vessel to land and also more generally on any methods to avoid potential spillages.

7.12 Effects on Terrestrial Ecology

This discussion on Terrestrial Ecology is based on a report prepared by Boffa Miskell Ltd titled "*Lyttelton Port Recovery Plan, Addendum to 2010 Report Prepared for Lyttelton Port Company*" (October, 2014). This report is attached as Appendix 22.

The assessment is focused on the quarrying at the existing Gollans Bay Quarry so as to supply rock for the reclamation as well as localised widening and realignment of the existing haul road connecting the quarry and the proposed reclamation.

⁴² Accepting that larger vessels would, all things being equal, reduce the number of visits.

⁴³ Vessels that handle cargo other than containers i.e. logs, fertiliser

⁴⁴ Same principle as a double-skinned fuel tank located on land.

7.12.1 Existing environment

The proposed quarry footprint provided potential habitat for four threatened indigenous plants. A spring survey (Dec 2010) confirms that only one of the target species was found, the annual fern (*Anogramma leptophyll*) and this was only found in one location on a cluster on a rock crop above and outside of the proposed quarry footprint.

In terms of potentially threatened species, the threat status of species is as set out in Table 7.3.

Table 7.3: Threat status of species recorded, or assumed to be present in the existing or proposed Gollans Bay Quarry

Scientific Name	Common Name	Threat Status ⁴⁵
<i>Festuca actae</i>	Banks Peninsula blue tussock	At Risk, Naturally Uncommon
<i>Einadia allanii</i>		At Risk, Naturally Uncommon
<i>Oligosoma</i> aff. <i>polychroma</i> Clade 5	Common skink	At Risk, Declining
<i>Woodworthia</i> cf. <i>brunnea</i>	Canterbury gecko	At Risk, Declining (Partial Decline)

Relevant ecological context criteria are contained within the Significance Criteria stated in the Canterbury Regional Policy Statement (2013). The presence of 'At Risk' plant species and the likely presence of 'At Risk' lizard species trigger the following rarity criteria:

- *Rarity. Criteria 4: Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.* The proposed quarry site includes At Risk – Naturally Uncommon species, Banks Peninsula blue tussock and *Einadia allanii* were recorded and the At Risk – Declining lizard species common skink and Canterbury gecko are very likely to be present.
- *Ecological Context. Criteria 10: Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.* Insufficient assessment to date, but the proposed quarry area at Gollans Bay may trigger this criteria for lizards.

All New Zealand Lizards are protected under the Wildlife Act (1953). Three species of indigenous lizards are very likely to occur in the existing and proposed quarry area. A Wildlife Act Authority, from the Department of Conservation will be required prior to undertaking works.

In June 2011, consent number CRC111660 was issued by the Canterbury Regional Council and RMA92018173 was issued by the City Council for the Order-In-Council Recovery Reclamation. As subject to the conditions appended to these consents, the consent lapses in 2016, and the former expires in 2046.

⁴⁵ Hitchmough, R.; Anderson, P.; Barr, B.; Monks, J.; Lettink, M.; Reardon, J.; Tocher, M.; Whitaker, T. 2013. *Conservation status of New Zealand reptiles, 2012. New Zealand Threat Classification Series 2.* Department of Conservation, Wellington. 16 p

7.12.2 Proposed changes to the Rules in the District Plan

The District Plan recognises that Gollans Bay is contiguous with the existing Port and has been subject to long established, periodic quarrying. In part this is recognised through the notation of the area as Port Environs Overlay Area and associated policy recognising the efficient use and functioning of the Port.

However, quarrying in the Rural Zone which includes Gollans Bay is a Discretionary Activity.

It is proposed to provide a notation over the area, providing a sub-zone for the Quarry and Haul Roads as 'Area 3'. Associated policy will recognise the use of the area for Quarry operations, but also the need to consider ecological values and undertake rehabilitation. The proposed provisions provide for quarrying as a Controlled Activity. Relevant assessment matters include the need to:

- manage effects on existing terrestrial ecology, in particular native lizard species, prior to and during quarrying; and
- enhance indigenous habitats as part of site rehabilitation.

7.12.3 Implications of the LPRP

The anticipated works are not seen as being materially different to those authorised by consent number CRC111660 and RMA92018173.

The quarry at Gollans Bay would again be a source of reclamation material. The development of the quarry and the final footprint would not materially change as to what was proposed for the Order In Council consents.

The haul road upgrade would not materially change from that provided for in the Order In Council consents with one exception. The exception relates to an extension of the haul road alignment down to Te Awaparahi Bay and to an increase in the width of the haul road.

7.12.4 Conclusion

The extent of works to the Haul Road and quarrying activities is to facilitate reclamation material. The works proposed will not differ significantly from those previously consented.

Quarrying and haul road activities unauthorized by the coal stockyard consent will require consideration of the effects on existing terrestrial ecology.

7.13 Effects on Infrastructure and Lighting

This discussion on the implications of Port Recovery on the infrastructure network and likely demands associated with the Recovery Plan Effects is based on a report prepared by Pederson Read Ltd titled "*Lyttelton Port of Christchurch Recovery Plan, Assessment of Electrical Power Supply*" (October, 2014) and "*Lyttelton Port of Christchurch Recovery Plan, Assessment of Environmental Effects: Lighting*" (October, 2014). These reports are attached as Appendix 23 and 24.

7.13.1 Existing environment

7.13.1.1 Power supply infrastructure

The Orion supply to all of Lyttelton is via dual circuit 11kV aerial cables on a single pole line over the Port Hills from the Orion Heathcote substation.

The Port complex receives an 11kV power supply from Orion's Simeon Quay substation via two underground cables with demarcation at the Port's main substation in Sutton Quay. Power is

supplemented with limited capacity 400 volt (0.4kV) standby generators for essential loads, at the Lyttelton container terminal (LCT) substation.

Internally, the Port's 11kV network was configured to provide two 11kV cable routes to all main substations. These substations include those located at Sutton Quay (main substation), Lyttelton Container Terminal (LCT), Officers Point, Te Awaparahi Bay, MCC3 (Coal reclaim), MCC2 (coal reclaim), Breakwater and Straddle Workshop. There are also two diesel powered 800kW standby generators located at the LCT substation to provide backup to the refrigerated (reefer) units.

As a consequence of the Canterbury earthquakes, a number of the main substations and cable networks were damaged or subject to a structural decrease in resilience. Substantial remediation works were undertaken, some under emergency to reinstate power supplies and respond to ground and wharf repairs. The primary remaining element requiring reinstatement is the 11kV ring main supply to the container terminal and coal facility.

7.13.1.2 Water supply and wastewater

Currently Lyttelton (and the Port) are provided potable water via the CCC reticulated network. This network is supplied by groundwater bores and is an on-demand system without specific supply. The main water supply lines run through the tunnels and a series of pump stations and storage reservoirs provide the pressure and volume requirements. The biggest water demand at the Port is for dust control at the coal stockyard and other operational areas.

Wastewater from Lyttelton and the Port is collected in a CCC reticulated network and treated at the Lyttelton Wastewater Treatment Plant. The treatment plant is located to the north of the Container Terminal. Wastewater (and trade waste) generated at the port is largely related to staff ablutions, ships do not discharge wastewater to the network.

7.13.1.3 Lighting

Lighting level and consistency are necessary to ensure a safe and functional Port. International guidelines indicate that appropriate illumination conditions include:

- Waterfront areas – 30 lux average horizontal luminance at ground level;
- Container handling areas – 50 lux average horizontal illumination at ground level;
- Design features such as:
 - Lighting from more than two directions to mitigate the effect of obstructions and provide 'depth of field';
 - Appropriate level of vertical illuminance;
 - Minimising disability glare to vehicle drivers;
 - Avoiding navigation hazard to shipping.

The impact of artificial lighting on the night environment can be characterised by: visual amenity; glare; light spill and sky glow.

The night sky environment in Lyttelton Harbour is significantly modified by the flood lit Port areas. Light impacts are particularly observed in the vicinity of the township and the Port, albeit topographical barriers and Port layout does reduce the extent of illumination. For example, the wharf area of Cashin Quay is mostly concealed from Lyttelton Township, although can be clearly seen from Governors Bay some 6km to the west. Illuminated Port areas are also visible from Diamond Harbour and many other points around the Harbour.

Current lighting methods and lighting arrangements:

- have been incrementally developed as the Port's operations have evolved;

- rely on conventional luminaires that provide reliable performance and adequate service life;
- utilise high pressure sodium (HPS) discharge lamps giving a distinctive orange illumination;
- have been limited to a maximum 30m pole height to comply with district plan provisions;
- result in high levels of illumination to suit operational needs, and health and safety requirements;
- utilise high luminaire aiming angles (above the horizontal), principally necessitated by required illumination levels and compliance with the 30m maximum pole height.

7.13.2 Implications of the LPRP

7.13.2.1 Power Supply Infrastructure

LPC are in the process of strategic planning to prioritise work necessary to increase the Port's power infrastructure.

External works already signalled by Orion include improving network connections, through: installation of a new cable through the Lyttelton Road tunnel to increase capacity to 14MVA and provide a backup for the existing Port Hills transmission line; reconfiguration of the existing Orion 11kV supply cables to enable the removal of the Simeon Quay substation; and the creation of a new internal substation in the vicinity of Norwich and Gladstone Quays. Such works are necessary to ensure that LPC has sufficient power supply capacity and resilience to accommodate proposed growth.

Internal works include: a new second source of supply from the Orion network to the LPC network, as obtained from the proposed new Orion Norwich Quay substation; a new central substation or a new / modified Officers Point substation. Substantial works are also needed to increase resilience to the internal cabling network.

7.13.2.2 Water and Wastewater

In terms of potable water supply and wastewater, there is not expected to be any significant demand increase as a result of the development of Port Operations. There may be some additional demand for potable water and discharge of wastewater as a result of the proposed Dampier Bay marina and associated shore-based development. However due to the proximity of the development to the reticulated network and the predicted gradual rate of the development as Port operations move to the east over time, no additional District or Regional Plan rules are considered to be necessary beyond the usual subdivision and building consent processes where the ability to service new development needs to be demonstrated. The scale of Dampier Bay development is modest in the context of Lyttelton Township and therefore will not generate demand on the reticulated network beyond that which would be anticipated through normal township growth and regeneration.

7.13.2.3 Lighting

The methodology to light developments in Dampier Bay and the expanded container terminal (Cashin Quay and Te Awaparahi Bay) will be to utilise new technology LED luminaires where practicable. A range of pole heights extending to 40m are proposed which will significantly reduce the visible glare and upward light spill in the Harbour.

In terms of the characteristics of the proposed lighting approach:

- Visual amenity – Lighting will enhance the night time environment in terms of access and movement. The effect of the proposed lighting approach will be a reduction over the glare and sky glow effects compared to the existing lighting network.
- Glare – No significant increase in glare is anticipated.
- Light Spill – Light spill will be insignificant and remain compliant with the current operative District Plan lighting rule for the Lyttelton Port Zone (Rule 2.3);
- Sky Glow – The use of 'flat glass' luminaires with LED technology with constrained directional light output will eliminate any significant direct emission to the night sky.

7.13.3 Proposed changes to the Rules in the District Plan

No changes are proposed to the District Plan provisions relating to Infrastructure provisions.

Proposed noise standards will facilitate the construction activities necessary to improve the resilience of infrastructure.

Deletion of the 30m height rule as it relates to lighting poles. The ability of lighting poles to extend beyond 30m provides benefits in terms of reducing glare and sky glow effects.

7.13.4 Other methods

Lyttelton Port Company will need to continue to advocate to Orion and the Christchurch City Council to ensure sufficient capacity and resilience is provided in network infrastructure. Construction activities will continue to be managed by the Construction Environmental Management Plan (CEMP).

7.13.5 Conclusion

The recovery of the Port, including its repair, rebuild and reconfiguration needs requires resultant and sufficient infrastructure provision. Sufficient electricity, water and wastewater supplies are currently provided, although recovery works are needed to improve overall resilience in the internal networks and to ensure capacity meets likely future demand.

It is recommended that appropriate agencies note the various infrastructure requirements and plan for the implementation of these improvements at the appropriate stage.

The lighting approach recommended provides improved visual amenity, reduced glare and compliant light spill. With developments in LED technology to enable 'flat glass' luminaires, and their use in the expanded container terminal will result in reductions in upward light spill.

7.14 Effects of Noise on Noise Sensitive Activities on Land

The discussion on the Construction Noise Effects of Port Recovery is based on a report prepared by URS New Zealand Ltd titled "*Lyttelton Port Recovery Plan, Assessment of construction noise effects*" (November, 2014). This report is attached as Appendix 26.

The discussion on Operational Noise is based on a report prepared by Hegley Acoustic Consultants titled "*Lyttelton Port of Christchurch – Port Recovery Plan, Operational Noise Assessment*" (November, 2014). This report is attached as Appendix 25.

7.14.1 Existing noise environment

Noise from Port operations has been part of the character of Lyttelton for many years. Sources of noise include:

- Reversing beepers;

- Cargo handling machinery and equipment;
- Repair and maintenance machinery and equipment;
- Integral refrigerated containers;
- Loading and unloading of vessels, vehicles and trains;
- Periodic events such as scrap metal loading and sand blasting; and
- Periodic maintenance and construction activities, recognising the extent of construction and recovery works currently underway at the Port, including Cashin Quay No2.

Attended and unattended noise monitoring has been conducted throughout 2014 at several locations in Lyttelton and Diamond Harbour. As can be expected there is significant ambient port noise. Night time noise levels in many of the monitoring locations were in the order of 55 dB L_{Aeq} . Specific maximum noise impacts such as container movements and straddle carrier operations were between 48 – 68 dB L_{AFmax} at some locations.

The most significant source of traffic noise is from vehicles using Norwich Quay. Typically about 7,500 vehicles per day use the Quay and of these about 1,800 are trucks.

7.14.2 Implications of the PLRP

The Port Recovery will consist of many projects involving repair, rebuilding and reconfiguration works. These ultimately result in moving port operations east over time. As a result, the predicted noise levels from port activities are to reduce over time in the eastern and central parts of the Inner Harbour as the noise sources move to the east. The introduction of a cruise berth at Navel Point or at Gladstone Quay is not predicted to change the noise levels in any significant way.

However, until Port Recovery is completed the Inner Harbour is expected to be used for a wide range of cargo handling operations. Given the complexities of repair, reconstruction and reconfiguration works it is difficult to predict with certainty the noise levels which will be generated during this period. Notwithstanding, the predicted noise contours remain very similar to those contours currently attached to the Port Noise Management Plan, and, as a result, it has been recommended that the existing contours be retained until the Port Recovery period has been completed.

The effect of noise from port activities carried out on the future reclamation at Te Awaparahi Bay on Diamond Harbour was also assessed. While the noise levels will increase slightly they would still be within the noise levels that are typically expected in a residential area.

During the Port Recovery period construction activities will be a feature. These activities broadly involve:

- Piling
- Demolition
- Sea wall rebuild
- Wharf rebuild
- Paving
- General civil works

These works produce varying levels of noise, called construction noise. Some of this construction work has commenced along Cashin Quay but will become more noticeable for residents as it moves into the Inner Harbour. Those works associated with piling and demolition involving the percussive breaking up of materials are predicted to be the noisiest and will require careful management in addition to the provision of mitigation measures for affected property owners.

Traffic along Norwich Quay is expected to increase as the port grows. While Norwich Quay is not part of the port and LPC has no control on the use Norwich Quay, the noise effects from this port growth have been assessed based on the forecast traffic flows.

The predicted increase is typically 1.2dB LAeq (24hr). Although the individual truck noise would be clearly heard, when assessed over a 24-hour period there is in fact a relatively small difference in the levels. Typically, a doubling of the traffic is required to increase the noise level by 3dBA and hence a 17% increase in truck numbers is the reason for 1.2dB LAeq (24hr) increase.

7.14.3 Proposed changes to the Provisions in the District Plan

As discussed above, operational port noise for at least the next 10 years is expected to remain similar to what is currently provided for in the Port Noise Management Plan. Accordingly the relevant provisions of the District Plan that include the requirement for a Port Noise Management Plan and a Port Noise Mitigation Plan are proposed to remain in place. This will include providing acoustic treatment for dwellings that fall within the 65 Ldn contour, which is currently managed under the auspices of Port Liaison Committee.

Most District Plans⁴⁶ include a rule that states construction noise must comply with the New Zealand Construction Noise Standard (NZS 6809). This means a resource consent is required whenever noise from construction activities exceeds the guideline construction noise limits identified in the standard. Obtaining resource consents on an 'as and when basis' is likely to result in significant delays to the Recovery work. Hence a Construction Noise Management Plan and a Construction Noise Mitigation Plan is proposed. The mitigation plan will set out the mitigation measures that are available to property owners depending on the duration and levels of construction noise involved, and these could include the provision of temporary accommodation, acoustic mitigation treatment or in a potentially worst case situation an offer to purchase the property. The provision of these mitigation measures would be carried out by LPC again under the auspices of the Port Liaison Committee.

Details on how construction noise is to be assessed and the contents of the Construction Noise Management and Mitigation Plans are provided in the proposed District Plan provisions.

In addition to the provisions contained in the District Plan, LPC will also be administering a Construction Environmental Management Plan for all construction activities undertaken at the Port. This plan includes specific requirements on contractors to assess the likely levels and effects of construction activities prior to their commencement.

Given the extended construction timeframes, LPC will also be regularly informing the wider Lyttelton Community of construction activities and their likely consequences, including noise.

Finally, Dampier Bay will see the establishment of some new activities such as retailing or premises serving the public. These activities have different noise characteristics compared with port activities and therefore standard noise provisions are being proposed for them. Thus a restaurant in Dampier Bay for example would need to meet the limits set at the boundary of the Residential Zones. The daytime and night-time noise limits proposed are typical of the noise limits used in District Plans for Residential, Commercial and Industrial Zones respectively.

7.14.4 Conclusion

Noise effects are currently managed in Chapter 33 of the Christchurch City Plan (Banks Peninsula Section). There are provisions that manage the operational aspects of Port activities through the use of Port Noise Contours and the management of sensitive residences that are located within

⁴⁶ Including the City Plan (Banks Peninsula section)

the 65dBA Ldn contour. Construction noise is currently managed through adherence to the levels specified in NZS6803.

The existing provisions relating to operational port noise are to continue, and the Port Liaison Committee would continue to manage the current acoustic treatment programme and be involved in any other issues relating to noise that arise. Construction Noise Management Plan and Mitigation Plans are being proposed, which again would be managed by the Port Liaison Committee. This is considered the most appropriate mechanism to enable Port Recovery to progress without delays while ensuring affected property owners receive any appropriate mitigation.

7.15 Effects on Air Quality

This discussion on air quality is based on a report prepared by Tonkin & Taylor Ltd titled "*Port Recovery Plan, Air Quality Assessment*" (October, 2014). This report is attached as Appendix 27.

7.15.1 Existing air quality environment

Based on previous monitoring, Lyttelton has clean air compared with Christchurch.⁴⁷ As a consequence it is not within a designated airshed for air quality management purposes, indicating that the local air quality is expected to comply with the National Environmental Standards (NES) for air quality.

Discharges to air from port activities include:

- Dust emissions from storage and handling bulk cargo, such as coal, and from truck movements and windblown dust on unpaved roads; and,
- Exhaust emissions (combustion products) from cargo handling equipment, road transport (trucks), rail transport (trains) and ships.

LPC currently holds air discharge permits for potentially dusty cargo such as coal, fertiliser, and logs. LPC also holds air discharge permits for quarry operation at Gollans Bay and also for the 10ha recovery reclamation currently undergoing construction.

LPC dust deposition monitoring data show that dust levels are generally within typical background levels for New Zealand, although elevated levels have occurred that could be attributed to port activities. Receptors most affected by dust emissions from the Port are residential properties on the eastern side of the Port elevated above the Inner Harbour general cargo area and also close to the coal stockyard.

The nearest monitoring site to coal stockyard operations (Timeball Station) has on occasion exceeded the consent limit for coal dust deposition, although this only has occurred twice in the last two years.

The number of complaints received in relation to dust from port activities are relatively low, with storage and transport of cargo (logs and fertiliser storage in the Inner Harbour) being the main cause of complaint in the last two years.

There are also discharges associated with emissions to air from ships at berth. Under the Resource Management (Marine Pollution) Regulations 1998, the emissions to air from ships during their normal operation (which includes propulsion) are explicitly allowed. This means that rules cannot be made in a regional plan (and a resource consent cannot be required under the Resource Management Act 1991) for the emissions to air from shipping.

⁴⁷ Although this is based on limited monitoring data.

There are also emissions to air of combustion products mobile plant, and from heavy vehicles accessing the site. Emissions to air from motor vehicles (including heavy trucks) are not directly controlled through the Resource Management Act 1991, but rather through other national measures such as vehicle emission standards and fuel specifications.

7.15.2 Implications of the LPRP

As detailed in Section 2, the Port Recovery will consist of many projects involving repair, rebuilding and reconfiguration works which ultimately result in the moving east of port operations in a timely manner.

These works have the potential to generate dust with the most significant sources of dust likely to be wind and/or traffic-generated dust from un-stabilised, dry, exposed surfaces such as exposed earthworks and reclamation, stockpiles and unpaved haul roads.

LPC has recently prepared a Construction Environmental Management Plan (CEMP) for the Port Recovery and this includes a dust management technical chapter that outlines the controls that will be put in place to manage dust. The CEMP states that all construction activities should be operated, maintained, supervised, monitored and controlled at all times, so that all dust emissions are maintained at the minimum practicable level.

Various methods are recommended to:

- Limit wind speed across exposed surfaces;
- Limit disturbance of soil or dusty materials;
- Stabilise of completed earthworks areas; and
- Maintain surface moisture content.

These are detailed in the Air Quality Report.

An increase in shipping emissions is expected to occur with larger ships although this is not expected to translate into a decrease in air quality as there will be an increase in separation distances from the closest houses to the terminal operations created by the relocation of activities to the east. In addition, the prevailing north-easterly and south-westerly wind directions at the Port will lead to dispersion of shipping emissions at this location away from sensitive receptors.

7.15.3 Proposed changes to the Rules in the Air Plan

Air discharges are managed in Chapter 3 of the Natural Resource Regional Plan (Air Plan). There are rules in the Air Plan that control the handling of bulk materials. Discharges to air from the handling, processing, conveying or storage of bulk materials is permitted provided certain thresholds of extraction, processing, handling or storage are not exceeded.

As discussed earlier, LPC has consents in place to discharge dust associated with the handling of cargo involving fine particles i.e. coal, fertilizer and logs. The existing rule that controls these activities is proposed to remain unaltered in the LPRP and the existing air discharge permits held by LPC will continue. Notwithstanding, it is expected that shifting the focus of cargo handling of bulk materials such as fertiliser and logs from the Inner Harbour to Cashin Quay will be of benefit in the longer-term.

It is however proposed to introduce a new controlled activity rule (Rule AQL42D) that manages the extraction, processing, handling or storage of materials associated with various repair and construction activities. The Council would reserve control over the establishment of a dust management plan and it is expected that it would be similar to that already incorporated in the CEMP.

A standard and term is also attached to the proposed rule, which states that the dispersion of particles shall not cause an objectionable or offensive effect on a sensitive activity. This is often found as a pre-condition in the Plan on permitted activities, including the discharge of contaminants into air from unsealed or unconsolidated surfaces on industrial or trade premises (Rule AQL38).

The proposed changes to the rules would ensure a focused and expedited decision making process for Lyttelton Port while ensuring the environmental well-being of communities is met through the implementation of a dust management plan and with a standard which requires that the dispersion of dust particles shall not cause an objectionable or offensive effect on a sensitive activity.

7.16 Management of construction activities and construction management plan

This assessment of the management of construction activities is based on a report prepared by Tonkin & Taylor Ltd titled "*LPC Construction and Environmental Management Plan*" (October, 2014). This report is included in Appendix 28. During the preparation of this report it has become evident that a marine mammal management plan is needed within the CEMPG. This is currently being worked on and the CEMPG will be updated with this information.

Typically in large construction projects a construction environmental management plan (CEMP) is prepared to manage the effects of construction activities, in tandem with regulation provided through District and Regional Plans. These effects largely relate to discharge to air, land and water as well as traffic and noise effects. These CEMPs are either prepared by the Contractor carrying out the work or the principal in charge of the work. CEMPs are often required as either a condition of consent or as part of a consent application and are prepared on a project by project basis. As discussed elsewhere in the AEE, it is proposed that the District and Regional Plan provisions will include controls on air discharge (principally dust) and noise. The proposed CEMPs will complement these statutory controls.

CEMPs are typically developed once the design details of individual projects are known and specific effects and their mitigation are able to be identified and addressed. Given the extent of damage to Port infrastructure, repair and reconfiguration works at the Port will in practice comprise multiple separate construction projects that will be undertaken over a number of years and by a range of different contractors. The design details of all repair and reconfiguration projects will not therefore be confirmed for some time, and therefore it is proposed that the Recovery Plan adopts an alternative approach to the management of construction effects. Instead of preparing a detailed CEMP, it is proposed instead to develop a robust framework which includes risk assessment tools, performance standards, approved mitigation measures and reporting and auditing requirements. Contractors will use the framework to prepare project specific CEMPs for all construction projects on the Port. The aim of this alternative approach is to create a system which ensures a consistent and high level of environmental management throughout the construction period and across the many contractors that will be working on the site during the recovery. It is also intended that the framework could be used to communicate to the community and stakeholders how construction effects were going to be managed during the recovery.

In order to achieve these aims LPC, with a range of experts, has prepared a Construction Environmental Management Plan Guideline (CEMPG) that is to form part of the Recovery Plan supporting information. Contractors will have the CEMPG at the time of tendering for work, and therefore there will be a greater understanding of the time and cost involved in appropriate environmental management for that project prior to being awarded the contract, as well as

providing certainty to the community that a consistent standard of environmental management will be in place across multiple projects and throughout the recovery period.

The CEMPG contains three key components:

- A section on the environmental setting and sensitivities of the Port's location and a description on how to use the CEMPG to prepare project specific CEMPS
- Technical chapters which provide background information on environmental risk assessment, roles and responsibilities, relevant performance standards, appropriate mitigation measures, monitoring and reporting requirements and contingency measures
- Project specific CEMP templates for the Contractors to populate with the information specific to their activity and the site's location

Accompanying the CEMPG is also an internal LPC document which provides additional explanation and guidance for LPC project managers. This document will be used, along with the CEMP, by the project management staff to ensure Contractor's CEMPs are robust, adhere to the requirements set out in the CEMPG and are complied with as the proposed works are undertaken. It is important to note that the document, by its nature, is a working document and may require amendments to adapt to both changing regulatory provisions, changes in environmental management techniques, methods and equipment. Changes will only be made to ensure an improved level of environmental management or to ensure compliance with updated regulations.

Overall the CEMPG provides a robust way to ensure construction effects are managed throughout the recovery period with a consistent set of risk assessments and mitigation measures. It also provides the community and stakeholders with information, at the outset, on how the construction will be managed throughout the recovery.

7.17 Effects on the needs of users of Lyttelton Port and its environs

7.17.1 Existing environment

Sections 1.4 and 1.5 above set out in detail the existing users of the Port, the range of cargoes and activities that occur within the Port, and the anticipated growth in cargo volumes and associated user needs that are anticipated over the life of the Recovery Plan. In summary, the users of the Port are predominantly commercial businesses involved in the exporting and importing of a wide range of cargoes, including containerised goods, logs, cars, fuel, coal, and bulk goods such as fertiliser and cement. Fishing vessels, cruise ships, ferries and tourist charter vessels, navy and research vessels, and associated dry dock and marine engineering and provisioning services are also important users of the Port. In addition to the wide range of commercial users, the Port area is also used by the community for a variety of small boat recreational activities that include yachting, motor boats, kayaks, waka ama, and stand up paddle boarding.

7.17.2 Implications of the PLRP

The core purpose and function of the Port is to facilitate the import and export of cargo as the primary method of connecting New Zealand businesses and communities to the world. As such the timely repair and recovery of the Port's ability to efficiently service the needs of the regional economy is the underlying rationale for the Recovery Plan. The proposed work programme to reinstate and improve the Port's infrastructure, wharfs, and cargo storage and distribution facilities is therefore designed specifically to meet the needs of the Port's users and customers. The recovery and reconfiguration of Port operations and infrastructure, including the significant efficiency gains in the timeliness with which cargo can be unloaded and distributed through the

'Port to the east' programme of works, has a direct benefit to Port users and the wider Canterbury economy.

The broad and diverse nature of Port users and cargos requires a flexible operational area that provides a wide range of facilities, storage spaces, and loading infrastructure. For example the infrastructure necessary to support bulk fuel delivery and storage is very different from the needs of cement importers or coal exporters. The PLRP has been designed to provide a comprehensive, integrated set of facilities to ensure that the diverse needs of Port users are able to be met both during the recovery phase and in the long-term. Infrastructure is also to be designed to accommodate both current needs and to have sufficient flexibility to accommodate anticipated growth in cargo volumes and types into the future.

In response to feedback from the community, and as a consequence of the 'Port to the east' strategy, the redevelopment of Dampier Bay is proposed as part of the Recovery Plan, with a wider diversity of activities also possible in the longer term for sites that directly front onto Norwich Quay. The Dampier Bay component of the Recovery Plan will enable the Port to better meet the needs of both recreational boating through the establishment of a modern marina facility, and to meet the needs of potential future 'Port users' in the shape of the wider community through enabling enhanced direct public access to the waterfront. Dampier Bay also has the potential to accommodate a relocated Diamond Harbour Ferry terminal in a safe and attractive waterfront environment and to provide for a wider range of boating, community, and commercial activities and facilities as part of a high quality waterfront area that plays a complementary role to the town centre.

The heavily constrained geography of the Port, combined with the extent of damage and the diverse needs of users, presents particular challenges during the recovery phase as various parts of the Port become construction sites rather than operational areas. The Port is committed to an ongoing dialogue with Port users throughout the reconstruction phase to ensure that their requirements are able to be met on an ongoing basis and to ensure that the Port is able to continue to play a critical role in the ongoing recovery and economic resilience of the Region.

7.17.3 Proposed changes to the Rules in the District Plan

In addressing the challenge of meeting user needs within the context of cargo growth, whilst concurrently undertaking the rebuilding and construction of substantial areas of the Port, it will be necessary to ensure that the Recovery Plan provides considerable operational flexibility regarding where cargo and construction materials are stored. The District Plan provisions need to provide for this flexibility, whilst concurrently ensuring that appropriate provisions are in place to manage any potential effects such as noise or glare beyond the Port's boundaries.

The recovery of Dampier Bay (and in the longer term adjacent to Norwich Quay), the provision of a modern marina, and the provision of good quality public access and associated commercial facilities and amenities to meet community and recreational user needs, requires amendments to the District Plan to enable a wider range of activities to occur in these areas relative to the balance of the Port's operational areas.

7.17.4 Other methods

As noted in the above section on recreation and tourism, in the event that a cruise berth is progressed in the outer harbour, consultation will be necessary with the Naval Point Yacht Club to explore how to manage any potential effects on yacht racing activities when cruise ships are in harbour. The development of the Dampier Bay marina will also involve licensing agreements being reached with marina occupants regarding the occupation and use of marina space.

LPC are committed to an ongoing dialogue with key users to ensure that their needs are able to be met. Such dialogue is an inherent component of any successful business where positive customer relations are of paramount importance. For the Port to be successful, both as a business and as one of the South Island's key gateways, it is fundamental that the operational management and infrastructure within the Port are suitable for meeting customer/user needs.

7.17.5 Conclusion

The purpose of the Port is to provide an effective and efficient gateway for the importing and exporting of cargo and for meeting the needs of a wide range of non-cargo vessels and recreational users. In order for the Port to deliver the wide range of facilities required by the diverse Port users, it is critical that the repair and recovery of Port infrastructure is able to occur in an efficient and timely manner. The fundamental purpose of the Recovery Plan is to facilitate the recovery of Port infrastructure for the benefit of the Port's users, and thereby facilitate the economic and social gains for the Region from having an effective gateway that enables cost-effective connections to the rest of the world.

The diverse nature of port users and the associated range of required facilities, combined with the geographically constrained nature of the Port and the extent of damage and construction, present a number of challenges. In managing and coordinating the ongoing need to meet user requirements whilst undertaking a significant construction project means that it is vital that through the recovery phase there is considerable flexibility provided for port operations and the areas within which different cargos and construction materials can be stored. The District Plan provisions need to provide for this operational flexibility, whilst concurrently ensuring that suitable safeguards are in place to manage effects beyond the Port site, such as noise and glare, and to provide for a broader range of activities within Dampier Bay to meet the needs of community and recreational users of the Port and waterfront.

8 Evaluation of the Proposed Port Lyttelton Recovery Plan (and its actual or potential effects) on the relevant statutory instruments

Clause 6.5.6 of the Direction requires an assessment of the proposal against a number of documents:

- Canterbury Earthquake Recovery Act 2011 (and implicitly the Recovery Strategy, Land Use Recovery Plan and the Christchurch Central Recovery Plan).
- The relevant considerations of the Resource Management Act 1991.
- The New Zealand Coastal Policy Statement 2010.
- Mahaanui Iwi Management Plan.
- Other relevant statutory and non-statutory plans. LPC considers these to be the relevant Regional and District Plans, the Lyttelton Township Master Plan and the Canterbury Regional Land Transport Strategy 2012-2042.

This Section provides an assessment of the proposal against the CER Act, as well as setting out how the proposal has been assessed against the other documents listed in Clause 6.5.6.

8.1 Assessment against CER Act

This section provides an assessment of the proposal against the CER Act. In particular, why the changes sought to the relevant planning documents discussed in Section 9, and ultimately the Recovery Plan as the mechanism for enabling these changes, are reasonably necessary in accordance with the purposes of the CER Act.

8.2 Background

As discussed in Section 1, as a result of the Canterbury earthquakes, the Port suffered substantial damage to its assets. Almost all assets require replacement or significant repair. The scale of damage is such that the Port is effectively facing a rebuild and is required to make long term planning decisions about the future shape of the Port in order to ensure its safe and efficient operation.

Prior to the earthquakes LPC was facing significant constraints in the face of projected growth, particularly from the agricultural sector in the Canterbury Region. Had the earthquakes not occurred, LPC would have made incremental improvements to its then existing assets to cope with short-term growth in freight but would have had to make decisions and take actions to proceed with the design and assessment work to underpin and enable long-term expansion of the Port to meet forecast demand. Long term design and expansion was also necessary as the current Port layout is not very efficient and not designed for modern cargo operations.

The current situation is that nearly four years after the earthquakes the Port is worse off than it was prior to the earthquakes as it has damaged assets and no incremental improvements have been undertaken to deal even with short-term demand. Some repair of damaged assets has begun, for example, the rebuild of Cashin Quay 2.

This need for recovery is in the face of growth forecasts for trade through the Port which have containers growing at a rate of between 2.7% and 5.3% per annum from 376,567 TEUs in 2014 to between 782,000 TEUs and 1,500,000 TEUs in 2041. If Lyttelton Port becomes 'big ship capable' then the higher end of the forecast range is more likely.

Included in this is the volumes of freight which will enter the Port at an unspecified time related to the region's rebuild. LPC considers it will be difficult to handle this freight on top of projected growth from the region. In political and practical terms the Port does not have an option of turning away freight associated with the rebuild of the region.

In summary, in terms of planning, effects assessment, consenting and construction LPC is now a number of years behind where it needed to be to meet projected growth had the earthquakes not occurred. One of the most significant issues which will exacerbate the ability to "catch up" from this point, is the time, costs and uncertainty in the meantime associated with the current planning framework.

LPC therefore views the Recovery Plan as necessary to provide for the recovery of the damaged port, including the repair, rebuild and reconfiguration needs of the port, and its restoration and enhancement, to ensure the safe, efficient and effective operation of Lyttelton Port.

8.3 CER Act provisions

8.3.1.1 Recovery Plan – sections 16 and 21

Section 16 provides the Minister may direct one or more responsible entities to develop a Recovery Plan. On 19 June 2014, the Minister jointly directed LPC and the Canterbury Regional Council to prepare a Lyttelton Port Recovery Plan in accordance with the process set out in the Direction.

Section 21 provides that, following the development and consideration of a draft Recovery Plan in accordance with the process set by the Minister, the Minister may approve the Recovery Plan.

8.3.1.2 Section 10

In exercising any powers under the CER Act, such as those under sections 16 and 21 to direct the preparation of, and approval of, a Recovery Plan, section 10 of the CER Act states how powers, rights and privileges contained in the CER Act are to be exercised. In particular:

- these powers must be exercised in accordance with the purposes of the Act; and
- powers may only be exercised where the chief exercise or Minister (as the case may be) "reasonably considers it necessary".

The Court of Appeal⁴⁸ has determined that "necessary" in the context of section 10 means:

"the exercise of power is needed or required in the circumstances, rather than merely desirable or expedient, for the purposes of the Act."

Further, the Court also held⁴⁹ that, when considering whether the exercise of power is needed or required:

"The Minister must consider that to be so "reasonably", when viewed objectively, if necessary by the Court in judicial review proceedings such as these. The Minister must therefore ask and answer the question of necessity for the specific power that he intends to use. This means that where he could achieve the same result in another way, including under another power in the Act, he must take that alternative into account."

To sum up, the Court has assessed section 10 as⁵⁰:

⁴⁸ Canterbury Regional Council v Independent Fisheries Ltd [2013] 2 NZLR 57 at [18]

⁴⁹ Canterbury Regional Council v Independent Fisheries Ltd at [18]

⁵⁰ Canterbury Regional Council v Independent Fisheries Ltd at [22]

“The Court must be satisfied that the Minister’s consideration of necessity was reasonable. This will involve the Court being satisfied that the Minister did in fact consider that the exercise of the particular power was necessary to achieve a particular purpose or purposes of the Act at the time the power was exercised, taking into account the nature of the particular decision, its consequences and any alternative powers that may have been available.”

Section 10 therefore provides a safeguard against the exercise of powers which carry significant consequences, including the overriding of normal processes, procedures and appeals under the RMA.⁵¹

The purposes of the CER Act are discussed below.

8.3.1.3 Section 3

The CER Act provides the following (relevant) purposes:

- to provide appropriate measures to ensure that greater Christchurch and the councils and their communities respond to, and recover from, the impacts of the Canterbury earthquakes;
- to enable community participation in the planning of the recovery of affected communities without impeding a focused, timely, and expedited recovery;
- to provide for the Minister and CERA to ensure that recovery;
- to enable a focused, timely, and expedited recovery;
- to enable information to be gathered about any land, structure, or infrastructure affected by the Canterbury earthquakes;
- to facilitate, co-ordinate, and direct the planning, rebuilding, and recovery of affected communities, including the repair and rebuilding of land, infrastructure, and other property;
- to restore the social, economic, cultural, and environmental well-being of greater Christchurch communities.

Of particular note in relation to these purposes, the Court of Appeal has previously determined that:

- “recovery” within the scope of the CER Act is not limited merely to restoring greater Christchurch to its previous state, but extends to enhancing or improving it in all respects. Therefore within the confines of the CER Act, all action designed, directly or indirectly, to achieve this objective is contemplated⁵². Section 3 sets out in detail what ‘recovery’ is for LPC and the Port; and
- “rebuilding” is to be given a broad meaning well beyond merely restoring physical structures, to cover not only improving infrastructure and the like, but also on rebuilding communities.⁵³ This confirms the scope of the CER Act is intended to reach beyond physical restoration and to encompass improving the well-being of people in greater Christchurch; and
- providing certainty within the planning framework is within the purposes of the CER Act.⁵⁴

⁵¹ Canterbury Regional Council v Independent Fisheries Ltd at [20]

⁵² Canterbury Regional Council v Independent Fisheries Ltd at [27]

⁵³ As defined in section 4(1) of the CER Act

⁵⁴ Canterbury Regional Council v Independent Fisheries Ltd at [39]

"...we consider that a decision designed to achieve planning certainty may be within its purposes. We do not agree with Mr Cooke that "certainty in RMA planning" is not within the purposes of the Act because it is not referred to explicitly in s 3. In our view the wide nature of the powers in s 3 and the overarching purpose of achieving the full social, economic, cultural and environmental recovery of Christchurch in a timely and expeditious manner do envisage providing the people of Christchurch and their businesses with RMA planning certainty. This conclusion is also reinforced by the specific provisions of the Act that override the RMA⁵⁵. Whether in a particular case such a decision is within the Act's purposes will, however, depend on the nature and consequences of the particular decision considered in the context of both the RMA and this Act."

Finally, the Court of Appeal determined that:

"The fact that the [CER Act] powers are significant and must be exercised for the purposes of the Act does not mean that the purposes should be interpreted restrictively when Parliament has made it clear that they should be interpreted broadly."

Any exercise of powers under the CER Act should therefore be viewed in the context of the above statements and the wide nature of 'recovery' as anticipated by the CER Act.

8.4 Other relevant considerations

The following documents are also relevant considerations in exercising powers under the CER Act and guide the preparation of the Lyttelton Port Recovery Plan.

8.4.1 Recovery Strategy

The Recovery Strategy for Greater Christchurch (the Recovery Strategy) prepared by CERA under the CER Act became operative on 1 June 2012. It is a statutory document that must be "read together with, and forms part of" other relevant legislation within the Greater Christchurch area set out in section 26(2) of the CER Act.

The Recovery Strategy, a document prepared by CERA under the CER Act, contains a number of visions and goals for recovery, as set out in section 04 of the Strategy, which support the preparation and approval of a Recovery Plan:

- In relation to Economic Recovery:
 - 2. Revitalise greater Christchurch as the heart of a prosperous region for business, work, education, and increased investment in new activities - by:*
 - 2.3 restoring the confidence of the business sector and the insurance and finance markets to enable economic recovery and growth;*
 - 2.7 collaborating with the private sector and government agencies to address obstacles to economic recovery and to match supply with demand for resources;*
 - 2.8 enabling a business-friendly environment that retains and attracts business;*
 - 2.11 facilitating the recovery and development of the Central Business District.*
- In relation to Built Environment Recovery:
 - 5. Develop resilient, cost effective, accessible and integrated infrastructure, buildings, housing and transport networks - by:*

⁵⁵ Sections 15, 23, 24, 25 and 27

5.1 coordinating and prioritising infrastructure investment that effectively contributes to the economy and community during recovery and into the future;

5.2 supporting innovative urban design, buildings, technology and infrastructure to redefine greater Christchurch as a safe place built for the future;

5.3 rebuilding infrastructure and buildings in a resilient, cost-effective and energy-efficient manner;

5.4 developing a transport system that meets the changed needs of people and businesses and enables accessible, sustainable, affordable and safe travel choices.

- In relation to Natural Environment Recovery:

6. Restore the natural environment to support biodiversity and economic prosperity and to reconnect people to the rivers, wetlands and Port Hills - by:

6.1 ensuring recovery activities value, protect and sustainably manage the sources of our water

6.2 ensuring ecosystems are healthy and functioning;

6.4 providing public access to and opportunities for outdoor recreation, cultural, social and economic activities.

The Lyttelton Port Recovery Plan must be consistent with the Recovery Strategy (section 18(1) of the CER Act).

8.4.2 Central City Recovery Plan

The Central City Recovery Plan was promulgated with the intention and vision for Central Christchurch to become the thriving heart of an international city. While critical to the recovery of the Central City and surrounds, the Central City Recovery Plan is not particularly relevant to the preparation of the Lyttelton Port Recovery Plan.

The Lyttelton Port Recovery Plan must however still be consistent with the Central City Recovery Plan (section 19(2) of the CER Act).

8.4.3 Land Use Recovery Plan

The Land Use Recovery Plan (*LURP*) was approved by the Minister for Canterbury Earthquake Recovery and was gazetted on 6 December 2013.

The LURP provides direction for residential and business land use development to support recovery and rebuilding across greater Christchurch.

The LURP identifies the Port as 'strategic infrastructure' and recognises the national and regional significance of the Port, including that its⁵⁶:

"ability to operate efficiently 24 hours a day and to expand over time is essential for the full social, economic, cultural and environmental recovery of metropolitan greater Christchurch. It is essential that the transport and handling of freight to, from and within the airport and port are efficient and reliable so that unnecessary transport costs and delays are avoided. Investigating how current and future freight demands can be met will support recovery of the region's economy."

⁵⁶ Land Use Recovery Plan, section 4.4.3, page 32

The LURP directed changes to a number of planning documents, including the Canterbury Regional Policy Statement (CRPS), in order to enable recovery in greater Christchurch. Of significance are the following provisions now incorporated into Chapter 6 of the CPRS:

Objective 6.2.1 - Recovery framework

Recovery, rebuilding and development are enabled within Greater Christchurch through a land use and infrastructure framework that:

(10) achieves development that does not adversely affect the efficient operation, use, development, appropriate upgrade, and future planning of strategic infrastructure and freight hubs;

Policy 6.3.5 – Integration of land use and infrastructure

Recovery of Greater Christchurch is to be assisted by the integration of land use development with infrastructure by:

(4) Only providing for new development that does not affect the efficient operation, use, development, appropriate upgrading and safety of existing strategic infrastructure,

(5) Managing the effects of land use activities on infrastructure, including avoiding activities that have the potential to limit the efficient and effective, provision, operation, maintenance or upgrade of strategic infrastructure and freight hubs.

The LURP provides that the Port, as strategic infrastructure, is required to support Greater Christchurch's recovery through transporting such things as building materials, equipment and personnel. In addition, the recovery of the Port, with the significant economic benefits this brings to the region, will add the wider recovery of the region.

A co-ordinated, efficient and expedited recovery will occur by ensuring that existing strategic infrastructure such as the Port can operate efficiently and effectively.

The Lyttelton Port Recovery Plan must be consistent with the LURP (section 19(2) of the CER Act). Clause 5.3 of the Minister's Direction confirms this and that the Port Recovery Plan must support existing and developing Recovery Plans.

8.4.4 Summary

The Recovery Strategy and the two existing Recovery Plans set the framework for the recovery of the city and region. In exercising any powers under the CER Act, recovery of these areas, as well as the Port, should be a paramount consideration, particularly given the purposes of the CER Act.

8.5 Assessment against the CER Act

As highlighted above, in exercising any powers under the CER Act, the Minister, chief executive, or their delegates, must only exercise their powers in accordance with the purposes of the CER Act and where they consider it "reasonably necessary" to do so.

8.5.1 CER Act purposes

The following is an assessment of the proposal against the relevant CER Act purposes:

(d) to enable a focused, timely, and expedited recovery

This is viewed as the most critical of the 'purposes' for LPC. This purpose has two 'strands' relevant to this Recovery Plan, that is, providing for expedited recovery of the Port and more

generally providing for the recovery of greater Christchurch to achieve the vision of the Recovery Strategy and Land Use Recovery Plan.

The Lyttelton Port Recovery Plan is being prepared in the context of the aftermath of the Canterbury earthquakes and forecast trends in trade and shipping. It will make a significant and continuing contribution to the economic well-being of Lyttelton, the City and the wider region which will enable recovery of these areas. A focussed, timely and expedited recovery of the Port is therefore essential for a number of reasons, including due to:

- The substantial damage the Port itself suffered from the Canterbury earthquakes of 2010 and 2011, therein diminishing its ability to assist the community's recovery and the ongoing requirements of the Port's customers;
- The need to act quickly because of the significant role of the Port in the city and region's recovery;
- The need to act quickly to repair and reinstate the damaged and destroyed assets so as to maintain insurance cover over LPC's substantial assets;
- The need for the Port to continue operating efficiently during the re-construction period;
- The need to protect the Port as best as possible against future seismic activity.

Recovery of the Port's assets in a focussed, timely and expedited manner is consistent with the Recovery Strategy, particularly the Built Environment goals discussed above.

The Recovery Plan will therefore provide LPC this certainty to allow a focused, timely, and expedited recovery. Crucial to this purpose, as determined by the Court of Appeal, is the need for the CER Act to expedite recovery by providing planning certainty in a way that the RMA cannot, through the sought changes to the relevant RMA planning documents to enable consents to be obtained.

Finally, facilitating the wider recovery of the city and region is also a critical component of this purpose. The Recovery Plan will ensure the continued provision of the significant and growing contribution the Port makes to the economic and social well-being of the residents and businesses of Lyttelton, Christchurch City, the Canterbury region and increasingly the wider South Island.

(f) to facilitate, co-ordinate, and direct the planning, rebuilding, and recovery of affected communities, including the repair and rebuilding of land, infrastructure, and other property

A Recovery Plan will facilitate, co-ordinate and direct the planning and recovery for the repair, reconfiguration and enhancement of the Port. The Recovery Plan approach allows LPC to provide the public with a cumulative assessment of the complete package of works (and associated effects of these works) that are required for the Port's recovery. This is a major benefit of this Recovery Plan (as opposed to a piecemeal resource consenting process under the current planning framework) given the significant scale of the required recovery works.

As previously determined by the Court of Appeal, 'repair' and 'recovery' anticipate enhancing or improving in all respects to cover not only improving infrastructure and the like, but also on rebuilding communities. Therefore the complete package of repair and enhancement works to be enabled through the Recovery Plan and subsequent resource consents involves not only restoring previous capacities, but enhancing the Port's infrastructure and capacities to ensure LPC can meet ongoing and future freight growth. As set out in Section 2, there are a significant number of repair, reconfiguration and enhancement projects which all fall within the CER Act definitions of 'repair' and 'recovery'.

(g) to restore the social, economic, cultural, and environmental well-being of greater Christchurch communities

This purpose requires the 'restoration' of a number of aspects of well-being. Each aspect is discussed in more detail below. However it is important to note that in many aspects of this Recovery Plan, LPC is going significantly further than just 'restoring' well-being, and is 'enhancing' well-being in a number of areas. LPC is in the unique position of needing to repair and rebuild the Port and can therefore utilise best practice, as well as modern day technology and techniques, to provide the best practicable outcomes for the community and the environment. These enhancements and recommendations from experts have been discussed at length in Section 7 and the technical reports contained in the Appendices.

Social well-being

The social assessment contained in Appendix 7 concludes that there are significant potential social benefits that can be realised through the Recovery Plan process. However the realisation of those benefits is dependent on 37ha of reclamation at Te Awaparahi Bay, which enables a cascade of changes in the location of port activities, thereby freeing up space in the Inner Harbour for public access. If the full reclamation does not proceed, the scale of potential community benefits will be more limited.

Several potentially significant social costs have also been identified during this assessment, specifically growth in vehicle traffic to the Port, and the extent of off-site effects associated with Port operations and reconstruction. These matters can be adequately addressed through amendments to the State Highway network, and appropriate controls in the District Plan to provide nuisance management and for the development of Dampier Bay.

Overall the Recovery Plan can restore and enhance the social well-being of the Lyttelton community and wider region.

Economic well-being

The Port Recovery Plan will remove obstacles to economic recovery, provide greater certainty, co-ordinate and prioritise infrastructure investment, leverage restoration investment to also provide new facilities required for changing circumstances and future growth, provide resilience against future seismic activity, help restore the brand and reputation of greater Christchurch as a place to invest and do business, and to enhance the overall level of economic well-being for the City and the wider Canterbury Region

The combined Port Recovery program of works will over the next 15 years involve expenditure of some \$900 million. Directly associated will be an estimated 70 jobs, and a payment of \$5 million in wages and salaries. Indirect, or multiplier benefits assumes the programme of works will generate around 150 jobs and \$10 million per annum in household income for Christchurch City residents.

Without a Port Recovery Plan there will still be a programme of works to rebuild and restore Port facilities which will provide economic benefits to the City and region. The extent and timing of such benefits would be less optimal than when compared to the greater planning certainty and flexibility provided by the Port Recovery Plan.

Overall, the Recovery Plan can restore and enhance the economic well-being of the Port, the Lyttelton community and the wider region.

Cultural well-being

A detailed cultural impact assessment has been prepared for the Recovery Plan. That assessment identified a number of recommendations for LPC to take into account when preparing the Recovery Plan. Key to these recommendations is ensuring that going forward, LPC's assessment and decision-making reflects Ngāi Tahu values, cultural well-being and use of the harbour and is consistent with achieving the following key outcomes identified by manawhenua:

- Improvements in water quality and a net gain in mahinga kai values, consistent with the long term vision of manawhenua to protect and restore the cultural health of Whakaraupō, mō tātou, ā, mō kā uri ā muri ake nei.
- Appropriate statutory decision making framework and level of control over the proposed Te Awaparahi reclamation.
- Improved certainty as to the potential effects of port structures on marine hydrodynamics, and therefore sedimentation in the upper harbour and mahinga kai.
- The enabling of an integrated whole harbour approach to harbour health and management, based on a clear vision of the harbour as a mahinga kai and community food basket.
- Effective and robust working relationships between Te Hapū o Ngāti Wheke, Te Rūnanga o Koukourārata, Te Rūnanga o Ngāi Tahu, LPC and Environment Canterbury throughout the development and implementation of the Port Recovery Plan, and beyond.

LPC has also separately engaged the preparation of a Kaimoana Report. This report has recommended a number of methods to enhance kaimoana, as part of a process of offsetting the impacts of the proposed reclamation. To take these recommendations into account, one of the controls in the proposed regional plan rules for the reclamation is the preparation of Kaimoana Management Plan.

LPC is committed to working with Ngāi Tahu during the preparation of the Recovery Plan and beyond, to ensure cultural well-being is not only restored, but maintained in the manner mutually acceptable to LPC and Ngāi Tahu.

Another facet of cultural well-being is historic heritage. A number of heritage buildings in the Port environs were damaged as a result of the earthquakes and have now been acknowledged. Moving forward under the Recovery Plan, from a heritage and archaeological perspective, the Recovery Plan area includes several significant listed heritage buildings. No works beyond general maintenance are needed to these buildings as part of recovery. The Port Recovery area also includes some 60 potential archaeological sites of varying significance. LPC are applying for a 'global' authority from Heritage New Zealand to damage or modify an archaeological site through undertaking the works necessary for Port recovery. It is therefore considered this facet of cultural well-being will be restored and maintained during recovery.

Environmental well-being

The technical reports provided have identified the environmental implications of the works to be enabled under the Recovery Plan, along with recommendations to ensure environmental impacts are minimised. Section 7 identifies the changes to the planning framework required to provide for these works. For the reasons set out in the technical reports, and Section 7, it is considered that the Recovery Plan will not have an adverse impact on environmental well-being and will in fact restore and enhance environmental well-being in a large number of areas by increasing environmental protection and mitigation measures through improved, modern infrastructure, the controls proposed through new district and regional plan rules and a comprehensive construction and environmental management plan as well as other management plans proposed through controls on planning rules, such as a Sediment Management Plan.

(a) to provide appropriate measures to ensure that greater Christchurch and the councils and their communities respond to, and recover from, the impacts of the Canterbury earthquakes

For the reasons already discussed at length, including the ability to provide for an expedited and focussed Port recovery and provide a complete package of the necessary recovery works, it is considered the Recovery Plan is the most appropriate measure to respond to, and recover from, the impacts of the Canterbury earthquakes.

(b) to enable community participation in the planning of the recovery of affected communities without impeding a focused, timely, and expedited recovery

The Minister's Direction provides a number of opportunities for public participation in the Recovery Plan process. LPC views public participation in this process to be critical to ensure the best possible outcomes are achieved for Port recovery.

As set out in Section 4, LPC and its experts, have already undertaken significant community and stakeholder consultation. LPC considers this consultation has adequately informed the public of the vision for the recovery of the Port and sets the platform for the next stage of the Recovery Plan process.

Summary

For the reasons set out above, the preparation and approval of the Recovery Plan meets the purposes of the CER Act. In particular, the Recovery Plan is critical to ensure the focussed, timely and expedited recovery of the Port.

8.5.2 "Reasonably necessary"

Upon being satisfied the Recovery Plan will meet the purposes of the CER Act, it must also be determined that the exercise of power to prepare and approve a Recovery Plan is needed or required in the circumstances. As determined by the Court of Appeal, this will involve being satisfied that the exercise of the particular power is necessary to achieve a particular purpose or purposes of the Act at the time the power was exercised, taking into account the nature of the particular decision, its consequences and any alternative powers that may have been available.

Critical to this determination of necessity is whether there are any viable alternatives to provide for recovery. LPC considers the alternatives are seeking resource consents under the current planning framework of the Resource Management Act 1991 (*RMA*) to either:

- repair of the existing, damaged infrastructure within the existing Port footprint; or
- undertake the repair, reconfiguration and enhancement in the same manner sought under the Recovery Plan.

As discussed in Section 3, just repairing and replacing the damaged assets within the existing footprint is not a viable option given the current inefficient layout of the Port and the projected freight growth.

The only other option is obtaining resource consents for the repair and reconfiguration proposals under the current RMA planning framework. It is therefore critical to understand the difference between seeking authorisation for LPC's proposed recovery works through a Recovery Plan which directs changes to key planning documents under the CER Act, compared with orthodox RMA processes for obtaining resource consents.

LPC is a large scale infrastructure which operates in a complex marine environment. Authorisations for various physical components have been obtained over many decades since the Port was established in the 1800s. Nearly all works associated with the rebuild and redevelopment of the Port require RMA consents. No Port has ever been faced with such a

significant consenting process where it is required to seek authorisation for almost all of its activities in the context of a complex marine and coastal environment and under time pressure.

The RMA never contemplated the complete consenting and rebuild of infrastructure on the scale of the Port under very short timeframes. Over 100 individual consents are likely to be required under an RMA process for the rebuild of the Port. Even if the individual consents are grouped together to apply to discrete physical structures/components of the Port there are still a significant number of components to consent.

Moreover the key planning documents applying to the Port contemplate a pre-existing Port continuing pre earthquake activities. The documents do not support or enable a rebuild and redevelopment on the scale now contemplated.

The complex nature of the marine and coastal environment in which the Port sits has implications in terms of drafting resource consent applications which are adequate in terms of their detail for the purposes of acceptance as applications which can be processed under the RMA. There is no "out" under the RMA which allows a different assessment because there has been an earthquake. Further, the RMA's purpose of "sustainable management", which requires a balance between enabling social and economic well-being and adverse effects on the environment, does not anticipate or provide for such significant recovery works.

Therefore due to the nature and complexity of LPC's proposed works, in the context of the coastal environment where there will inevitably be adverse environmental effects, and the timeframes LPC must work under to obtain consents, it would run a real risk of having its applications for some or all components not accepted, delayed, or declined.

In contrast, the CER Act purposes focus on enabling a focused, timely, and expedited recovery and restoring the social, economic, cultural, and environmental well-being of greater Christchurch communities. The CER Act purposes therefore enable a Recovery Plan to provide timely changes to planning documents to provide 'RMA planning certainty' at an early stage and in an appropriate context (particularly at an objective and policy level) even though resource consents may still subsequently be required for some activities.

An RMA fast track process, i.e. referral to a Board of Inquiry or direct referral to a Court, does not deal with these issues as these all relate to the planning framework under which any application will be considered and the amount of information required to lodge applications and go to the quality of the substantive outcome rather than the speed of processing from the time an application is made. The RMA does not contemplate a different standard of application merely because of circumstances created by the earthquakes.

Overall, the orthodox RMA processes are wholly inappropriate for a recovery project of this nature and scale in terms of having certainty as to what the substantive outcomes will be, and in terms of time and cost.

LPC has engaged a significant number of experts to provide reports to support the changes to the relevant planning documents through the Recovery Plan. LPC is therefore not providing a 'lesser standard' of material to support the preparation of the Recovery Plan. Rather, LPC considers the Recovery Plan can clearly and comprehensively articulate the actions required to enable a general eastward shift of Port operations to open up the Inner Harbour to public access. The Recovery Plan accordingly provides a more structured and complete assessment of effects and implications of the proposed works given the holistic approach that has been taken. For example, the 'whole of harbour approach' and essentially a cumulative effects assessment of all repair and enhancement activities are being considered as one, rather than on a piecemeal, project by project basis, as would occur under the RMA. The Cultural Impact Assessment highlights this whole of harbour approach as a critical component of the Recovery Plan.

For this reason, it is critical that all aspects of LPC's vision for the Port's recovery are included within the Recovery Plan. That is, everything from Inner Harbour works, the reclamation, the quarry and the capital/maintenance dredge area.

It must also be stressed that LPC still anticipates the need to obtain a number of resource consents. This consenting process would however occur within a more focussed planning framework which contemplates recovery.

LPC therefore considers there are no other viable alternative, so the proposed works to be enabled through the Recovery Plan are necessary to achieve the purposes of the CER Act, taking into account the nature of this particular decision, its consequences and any alternative powers that may be available.

As time passes since the earthquakes, whether the Recovery Plan is still 'reasonably necessary' for an expedited recovery may be questioned. LPC recognises that over three and a half years have passed since the earthquakes, so the need for an 'expedited recovery' and necessity of utilising CERA's powers may implicitly decrease with time however due to ongoing insurance negotiations, LPC had for several years have been unable to really progress recovery plans, with planning really only able to begin once clarity around the insurance settlement was received. It is therefore considered that as time goes on and the rebuild and recovery remains largely on hold, the need for the Recovery Plan (and get on with redevelopment) increases.

8.5.3 Conclusion

The preparation and approval of a Recovery Plan meets the purposes of the CER Act, particularly given the need for public participation in providing for the focussed, timely and expedited recovery of the Port.

For the above reasons, it is considered that it is reasonably necessary for the Recovery Plan to be prepared and approved, and in doing so, this would meet the purpose of the CER Act. Ultimately, it is not considered that there is any other means by which the same result can be achieved while achieving an expedited recovery.

8.6 Other relevant documents

The Minister's Direction also requires an assessment of the proposal against:

- The relevant considerations of the Resource Management Act 1991 (*RMA*).
- The New Zealand Coastal Policy Statement 2010.
- Mahaanui Iwi Management Plan.
- Other relevant statutory and non-statutory plans. LPC considers these to be the relevant Regional and District Plans, the Lyttelton Master Plan and the Canterbury Regional Land Transport Strategy 2012-2042.

This section discusses how these documents are relevant to the Recovery Plan and have been assessed in the technical reports provided to support the Recovery Plan.

As already discussed at length above, the Recovery Plan, and any actions or activities authorised by the Recovery Plan, must be in accordance with the purpose of the CER Act (section 10(1)) and the Minister can only approve the Recovery Plan if it is considered to be "reasonably necessary" (section 10(2)), that is, reasonably necessary for recovery and achieving the purpose of the CER Act.

The CER Act and its purposes therefore guides the preparation of a Recovery Plan. Critically, given the presence of the CER Act, the Recovery Plan does not have to be developed or considered to

meet the purpose of the RMA. Further, section 19(4) of the CER Act states that nothing in section 32 or Schedule 1 of the RMA applies to the development or consideration of a Recovery Plan.

Section 7 summarises the technical reports that have been produced by a number of experts on behalf of LPC. These experts were asked by LPC to:

- Undertake their assessments of the implications of the Recovery Plan in the context of the CER Act, with their conclusions to be guided by the purpose of that Act, as well as the requirements of the Direction. In particular, this required an assessment of how LPC's long-term vision for the efficient, timely and effective repair, rebuild and restoration and enhancement of Lyttelton Port can be provided in the Recovery Plan in a way that enables an expedited recovery that restores social, economic, cultural, and environmental well-being;
- Have regard to the 'relevant considerations' of the RMA and other documents, to the extent these documents were relevant to inform and provide guidance for their assessment.

Examples of how experts have taken into account 'relevant considerations' include:

- The Integrated Transport Assessment considered the objectives and outcomes of the Canterbury Regional Land Transport Strategy 2012-2042 and the relevant objectives and policies of the Banks Peninsula District Plan.
- The Landscape Report provided an assessment of the implications of the Recovery Plan on a number of aspects of 'landscape', drawing guidance on what these aspects are from relevant documents. This included:
 - consideration of the relevant aspects of the New Zealand Coastal Policy Statement 2010 (*NZCPS*), including to provide guidance on assessing 'natural character', 'natural landscapes';
 - the Report assessed 'amenity values' using the defined term from the RMA; and
 - the Report also had regard to the Lyttelton Master Plan.
- The Urban Design Assessment similarly provided an assessment of the implications of the Recovery Plan on a number of aspects of 'urban design', drawing guidance on what these aspects are from relevant documents. This included:
 - 'amenity values' under the RMA;
 - the need for public open space within and adjacent to the coastal marine area, for public use and appreciation, including active and passive recreation, as recognised by the NZCPS;
 - the *New Zealand Urban Design Protocol* and *People and Places and Spaces: A Design Guide for New Zealand* which both provide key context and guidance for urban design assessment; and
 - the Lyttelton Master Plan, including the goals from this Plan of relevance to the Recovery Plan.
- The Recreation and Tourism Report also considered issues of relevance from the NZCPS, particularly the effects of reclamation in the coastal marine area and the desire to provide for public open space and walking access in the coastal environment.
- The Strategic Social Assessment considered the Lyttelton Master Plan. This was because the Master Plan embodies important expressions of community aspirations and possible future initiative, and the relationship between the Town and the Port is clearly important in this regard.

- The Cultural Impact Assessment provided an assessment of the Recovery Plan proposal against the Mahaanui Iwi Management Plan.
- The Air Quality Assessment considered that, in the context of air quality, the National Environmental Standards for Air Quality, the Canterbury Natural Resources Regional Plan and the Ministry for the Environment's Good Practice Guide for Assessing and Managing the Environmental Effects of Dust Emissions all provided guidance on how to assess the effects of activities on air quality.

The CER Act was promulgated with significant powers and to provide planning certainty in a difficult environment in a way that the RMA could not provide. It is therefore considered a traditional RMA assessment, against the purpose of the RMA and relevant RMA planning documents is inadequate to properly assess the proposal against the CER Act.

The assessments undertaken by LPC's experts, in particular, the ways in which their assessments have been guided by 'relevant considerations' from documents such as the RMA and NZCPS, are therefore adequate to assess the proposal against the CER Act.

9 Amendments to Relevant Instruments

9.1 Introduction

The amendments to the relevant instruments are set out in this Section. The rationale for the changes is to enable the Recovery of Lyttelton Port, including its repair, rebuild and reconfiguration to be completed in a timely manner, so that its operation is restored and enhanced.

Consistent with the vision set out in the Port Lyttelton Plan, the proposed provisions of the relevant instruments have been amended in various ways to enable:

A new container terminal is to be established on up to a 37ha of reclaimed land in Te Awaparahi Bay;

The development of Dampier Bay to provide a commercial marina and associated activities, with public access and connectivity between Lyttelton and other parts of Naval Point; and

Port operations to continue elsewhere as presently the case.

The amended provisions also recognise that part of Port Recovery involves being able to service larger ships. The design of the new wharves in Te Awaparahi Bay, Cashin Quay and south of Naval Point (for cruise ships) are premised on the deepening and extension of the navigation channel, ship-turning basin and berths.

Given the complexity of Port Recovery many design details on various projects are still in the development phase. However, an envelope of the actual or potential impacts of the Port Recovery has been completed (Section 7) enabling provisions to be amended so that Recovery can proceed without unnecessary delays through protracted consent processes.

At the same time there is a need to ensure that the cultural and environmental well-being of communities is met during the detailed design phase so that adverse effects from the repair, rebuild and reconfiguration works can be mitigated through conditions of resource consent. These are included in the conditions where appropriate.

Amendments are proposed to the following documents:

- Canterbury Regional Policy Statement – introduces umbrella policy which recognises Port Recovery;
- Regional Coastal Environment Plan – introduces or amends objectives, policies and rules that apply to Port Recovery within the coastal marine area;
- Proposed Canterbury Land and Water Regional Plan, Natural Resources Regional Plan and the Land and Vegetation Management Regional Plan – introduces or amends objectives, policies and rules relating to land-based water quality or air quality; and
- Banks Peninsula Chapter of the Christchurch City Plan – introduces or amends objective, policies, and rules for port-related land use.

A summary discussion of the proposed changes to each of the documents is provided in the following sections.

9.2 Regional Plans

9.2.1 Regional Policy Statement

Chapter 5 (Land-use and Infrastructure) of the Canterbury Regional Policy Statement (RPS) provides recognition of the need to integrate land-use and regionally significant infrastructure, as

well as the importance of having effective and efficient regionally significant infrastructure. The focus of this Chapter is however largely on the 'Wider Region' outside Greater Christchurch.

Chapter 6 (Development of Greater Christchurch) of the RPS was introduced through the LURP and is addressed in more detail in Chapter 6 of this report. Chapter 6 provides a resource management framework for the recovery of Greater Christchurch, to enable and support earthquake recovery and rebuilding, including restoration and enhancement. Objective 6.2.1 and Policy 6.3.5 in particular recognise the need for recovery to be enabled in a manner that does not adversely affect the efficient operation, use and development of strategic infrastructure (including the Port).

The focus of Chapter 6 of the RPS is predominantly on land use and ensuring land use recovery does not adversely affect strategic infrastructure. In order to be consistent with the changes sought to the objective and policy framework for the Regional Coastal Environment Plan and the Christchurch City Plan, an amendment to Policy 8.3.6 in Chapter 8 (Coastal Environment) is necessary to recognise:

- the need to enable recovery of the Port in the coastal environment; and
- the Port must be enabled to recover in a focused, timely and expedited manner while continuing to operate and develop in an efficient and effective manner given its strategic importance to the region.

The necessary amendments to Policy 6.3.5 are included below:

Policy 8.3.6 – Regionally significant infrastructure

In relation to regionally significant infrastructure in the coastal environment:

- (1) to provide for the recovery of the Port of Lyttelton, including its repair, rebuild and reconfiguration in a timely manner;
- (2) *provide for its efficient and effective development, operation, maintenance and upgrade;*
- (3) *provide for a range of associated activities that have an operational requirement to be located in that environment;*
- (4) *recognise the potential of renewable resources in the coastal environment, such as energy from wind, waves, current and tides; and*
- (5) *avoid development that may result in reverse sensitivity effects that constrain the ability of the infrastructure to be developed and used (because of the imposition of time or other operational constraints)*

Such provisions should avoid, remedy or mitigate the adverse effects on that environment and take into account:

(a) that the ports of Lyttelton and Timaru need to dredge and deposit spoil in the coastal marine area outside the port areas to remain operational.

(b) that the recovery, repair, rebuild and reconfiguration of the Port of Lyttelton in a timely manner will require a container terminal being established in Te Awaparahi Bay on up to 37 ha of reclaimed land;

(c) that regionally significant infrastructure may need to be further developed in response to commercial opportunities and community needs.

(d) that the operators of regionally significant infrastructure need to have their own controls over access to operational areas, and that public access to such areas is not always appropriate.

(e) national port noise standards.

(f) the effects of coastal erosion, climate change and sea level rise.

This policy implements the following objective:

Objective 8.2.1, Objective 8.2.2, Objective 8.2.4 and Objective 8.2.5.

Methods

The Canterbury Regional Council:

Will:

Set out objectives and policies, and may include methods in its regional coastal plan that provide for regionally significant infrastructure by reducing constraints on their recovery, efficient and effective development, operation, maintenance and upgrade while avoiding, remedying or mitigating adverse effects and the effects on them of other activities, including reverse sensitivity effects, as far as practicable.

Should:

Consider the transfer of functions, powers or duties where the operation of rules governing noise can best be administered by the appropriate territorial authority.

Territorial authorities:

Will:

Set out objectives and policies, and may include methods in district plans that:

(a) recognise that regionally significant infrastructure needs to be able to recover in a timely manner, while continuing to operate and develop in an efficient and effective manner in the coastal environment.

(b) avoid land-uses that have reverse sensitivity effects on regionally significant infrastructure in the coastal environment.

Local authorities:

Should:

(4) Work together to develop a regional coastal strategy or district coastal strategies to integrate planning for the coastal environment, including regionally significant infrastructure.

Principal reasons and explanation

Following the major earthquakes of 2010 and 2011 the Port suffered extensive damage and it will take many years to complete the recovery of the Port. The Port must be enabled to recover in a focused, timely and expedited manner while continuing to operate and develop in an efficient and effective manner given its strategic importance to the region.

The effective and efficient operation and development of regionally significant infrastructure is essential for the well-being of the community. When developing, modifying, maintaining and operating regionally significant infrastructure, it is not always practicable to 'internalise' all adverse effects on the environment. In the case of sea ports, the infrastructure influences the quality of the environment surrounding it. As a result, care needs to be taken locating activities that may affect the efficient and effective operation and development of regionally significant infrastructure, including noise sensitive activities. There is a need for the recognition and appropriate provision for activities, such as renewable energy generation and reclamations associated with ports and transport networks, that are important to the social, economic, and

cultural well-being of people and communities, and that, by their very nature, need to be located in the CMA.

Regionally significant infrastructure includes commercial maritime facilities at Kaikōura and the ports of Lyttelton and Timaru. They are important for the social and economic well-being of Canterbury. They provide for the effective movement of people and goods within, into and out of Canterbury, creating important connections between people, places and markets. Development may result in activities which are incompatible with the efficient use and operation of regionally significant infrastructure at Kaikōura or the ports of Lyttelton and Timaru. These may be incompatible because they require a level or type of environment which cannot be reasonably achieved close to the facilities at Kaikōura or the ports of Lyttelton and Timaru – for example in relation to noise or safety. They may also adversely affect operations and safety by creating the potential for conflicts, for example encouraging water recreation in or near shipping zones.

9.2.2 Regional coastal environment plan

9.2.2.1 Overall approach

A new Chapter Ten of the Regional Coastal Environment Plan (“Coastal Plan”) is proposed (included in Appendix 29) which is solely concerned with Lyttelton Port. This enables readers of the plan have a “one-stop shop” when wanting to examine the rules that apply to the Port and its operations. It also enables objective, policies and rules to be clearly articulated and understood in the context of the Port’s Recovery, and provides clear linkage between the policies and the rules.

The existing policies in the coastal plan that directly refer to Lyttelton Port have been deleted and are instead dealt with in Chapter Ten. It is emphasised however that the objectives and policies in other chapters where relevant still apply to the Port. In other words, any resource consent that needs to be applied for would be assessed against the objectives and policies in Chapter Ten and also the wider objectives and policies in the coastal plan.

Chapter Ten rules apply to:

- Various port related activities that occur within the Operational Area of Lyttelton Port, including dredging and discharges;
- Dredging and associated discharges associated with the existing main navigation channel; and
- Discharges and deposition of dredge spoil at the existing deposition grounds on the north side of the harbour.

The Operational Area of Lyttelton Port is shown on proposed Map 5.1. The main navigation channel is shown on proposed Map 5.3 and the Spoil Dumping Grounds in shown on proposed Map 5.5.⁵⁷

The rules in Chapter Ten follow the same order as in the existing coastal plan i.e.

- Discharges to the coastal marine area;
- Erection, repair or demolitions of structures;
- Disturbance of the seafloor from construction works or dredging;

⁵⁷ The existing coastal plan maps already shows these areas however the boundaries of the Operational Area of Lyttelton Port are proposed to be amended slightly and the navigation channel has been amended to show the correct position.

- Deposition of sediment onto the seafloor from associated with construction works or from dredge spoil;
- Introduction or planting of exotic plant species
- Occupation of the coastal marine area; and
- Reclamation.

These activities are listed under Section 12 (1) and (2) of the RMA⁵⁸ and are not allowed in the coastal marine area unless expressly permitted by a coastal plan.

There are other rules in the existing coastal plan that are not being carried over into Chapter Ten. The rules relate to activities that are allowed in the coastal marine area unless the rules in the coastal plan state otherwise. The rules concern:

- The operation of vessels or vehicles;
- Activities emitting noise;
- Use of structures or vessels as residences or habitable dwellings; and
- Production or storage of hazardous.

The above rules either permit the activity in question in the Operational Area of Lyttelton Port or are irrelevant to the Port. Given the presumption is that these activities are allowed unless otherwise controlled by a rule then there is no need to carry these activities across into Chapter Ten.

The rules on noise are included in this category. Noise is proposed to be managed in the District Plan because the sensitive receptors of noise (e.g. dwellings) are located on land and there is currently a comprehensive approach to managing port noise contained in the District Plan.

Technically, the vessels at berth and the loading and unloading of the vessels within the coastal marine area could be subject to rules in the coastal plan. However, it is in reality impossible to separate the sources of noise from activities crisscrossing the coastal marine boundary. The Environment Court has previously taken a pragmatic approach when addressing port noise at Lyttelton. Noise being emitted from activities on the water and land are measured and assessed together and addressed in the District Plan.⁵⁹ This approach also occurred at Port Otago.⁶⁰ The noise rules applying to Lyttelton have therefore been superseded. Construction noise associated with Port Recovery is also proposed to be addressed comprehensively in the District Plan and is again appropriate given the sensitive receptors are on land.

There is one exception to the above. Underwater noise emitted from piling activities needs to be addressed coastal plan because of its actual or potential effects on marine mammals, and in particular Hector's Dolphin.

The main features of the rules contained in Chapter Ten are summarised below.

9.2.2.2 Discharges

Specific discharges to the coastal marine area, such as the discharge of stormwater, are to continue to be listed as permitted activities. However narrative standards on the permitted activity rules are proposed rather than the present mix of quantitative or narrative standards on

⁵⁸ Resource Management Act, 1991

⁵⁹ See Consent Order *Lyttelton Port Company verse Banks Peninsula District Council*, ENV 2006-CHC-000197, ENV 2006-CHC-000231, ENV 2006-CHC-000232, dated February 2007.

⁶⁰ See *Careys Bay Association Incorporated verse Dunedin City Council*, Decision C150/2003 and C41/2004.

the existing permitted activity rules. The reason for this is that the Lyttelton Harbour receiving environment is highly variable and does not lend itself to quantitative standards.

A new standard is proposed for the discharge of stormwater from Port's flat land other than Naval Point. It would require the installation of hydrocarbon and gross pollutant interceptors in those parts of the Port's stormwater network that are being renewed as part of Port Recovery.

Because of the size and duration reclamation construction, it is considered that a new rule should be introduced that addresses discharges of stormwater from the reclamation area. Likewise, a new rule is being introduced in the event that there is a need to decant seawater from a bunded reclamation paddock should marine fill be used for example. Environment Canterbury would then be able to impose conditions on the management of sediment or turbidity plumes from stormwater or from the decanting of seawater.

Discharges of stormwater into the coastal marine area from hillside earthworks are proposed to be listed as a controlled activity with the Councils control being reserved over the management of sediment.⁶¹ The discharge of stormwater from hillside works has previously been assessed and the main issue is to ensure that any silty loess is appropriately managed through the use of dosed silt ponds.⁶²

There is a new permitted activity rule, subject to standards, to enable the discharge of dyes or tracers. These dyes or tracers are used to assist determining a 'reasonable mixing zone' for point source discharges of a contaminant.

Dredge spoil has been deposited at the existing spoil grounds for many decades and the effects on the receiving environment of this discharge have been monitored for 20 years now. Although no significant effects have been observed dredge spoil continues to a discretionary activity as is the case in the existing RCEP.⁶³

9.2.2.3 Structures

New wharf structures in the Inner Harbour and along Cashin Quay are proposed to be listed as a permitted activity rather than a discretionary activity in the existing coastal plan. This is the existing working port area and will continue to be so into the future.

The configuration of the wharf structures in the Inner Harbour is expected to change with the demolition of some wharves and introduction of new structures associated with the marina or a possible cruise berth at Gladstone Pier. The configuration and the extent of the wharves will be always be constrained by the need for vessels to manoeuvre into and out of the Inner Harbour berths.

The new wharf structures at Te Awaparahi Bay and to the south of Naval Point in the outer Harbour (cruise ship option) are proposed to be listed as controlled activity. These wharf envelopes are within the existing Operational Area of the Port and are considered appropriate in principle (refer Section 7) but a consenting process is required to address designs details and construction techniques. The existing coastal plan allows for the repair, maintenance, or reconstruction of existing structures with a nominal ten percent increase in the cross-sectional area. This has been carried over into the Chapter Ten although reference is now made to ten

⁶¹ Small-scale earthworks are permitted provided there is after reasonable mixing not discharge of conspicuous sediment.

⁶² LPC presently holds a controlled activity consent for the discharge of stormwater into the coastal marine associated with the haul road upgrade (refer to CRC111661 - this consent was issued under Canterbury Earthquake (Resource Management Act Port of Lyttelton Recovery) Order 2011).

⁶³ It must be classified as a full discretionary activity in a coastal plan under the Resource Management Marine Pollution Regulations, 1998.

percent increase in 'plan view' rather than 'cross-sectional area' because the latter is difficult to measure.

All other structures in the Operational Area of the Port, such as buoys, navigational aids, structures associated with a network utility are proposed to be listed as a permitted activity. These ancillary types of structures are appropriate for the Operational Area of a Port. The exception to this could be the use of signs other than for the purposes of providing information on safe behaviour or of threats to their health and safety. A sign for any other purpose is proposed to be a restricted discretionary activity.

9.2.2.4 Disturbance

Disturbance associated with Recovery works is to be permitted providing the Construction Environmental Management Plan ("CEMP") is adhered to. The CEMP is to include procedures on how to characterise sediment in the Inner Harbour before construction works commence to ensure any sediment with elevated levels of contaminants are appropriately managed.

Disturbance associated with maintenance dredging of the Operational Area of the Port continues to be a permitted activity although the sediment within the Inner Harbour needs to be assessed for contaminant levels prior to the commencement of dredging.

9.2.2.5 Deposition

Deposition of sediment directly associated with Port Recovery works is proposed to be a permitted activity. The deposition of dredge spoil, which has been generated by Recovery works, at the spoil grounds is proposed to be a controlled activity given the limited quantity of dredge spoil involved.⁶⁴ The exception is for the larger volumes of dredge spoil material that would be generated from construction of the outer cruise berth.⁶⁵

The deposition of dredge spoil associated with the maintenance dredging of the Operational Area of the Port or the Navigation Channel is proposed to be restricted discretionary activity with discretion being reserved over marine ecology and cultural values.⁶⁶ For those areas of the Inner Harbour with sediments that may contain elevated levels of contaminants, an assessment is required to determine whether the dredge spoil is suitable for unconfined sea disposal.

9.2.2.6 Introduction or planting of exotic plant species

This is a carryover from the existing coastal plan. No introduction or planting of exotic plant species is being proposed as part of the Port Recovery.

⁶⁴ As noted earlier, the monitoring of historical deposition of dredge spoil at the existing spoil grounds has not revealed any significant effects on marine ecology.

⁶⁵ The volumes of maintenance dredge spoil deposited in the spoils depositional grounds varies from approximately 280,000 m³ to 590,000 m³ although in 2009 just over 800,000 m³ needed to be dredged due to swell conditions during that year. Therefore any dredge spoil generated from the Recovery works should be incremental and fall within the typical range of spoil deposited during maintenance dredging. The volume dredge spoil generated from the establishment of a cruise is however provisionally estimated to be in order of 700,000 m³ and so would be classified as a restricted discretionary activity rule.

⁶⁶ Although there is a somewhat artificial distinction between the discharge of dredge spoil into the water column and the deposition of dredge spoil on the seafloor, the former must as noted earlier be considered a full discretionary activity in a coastal plan by the Resource Management Marine Pollution Regulations, 1998.

9.2.2.7 Occupation

Occupation of the coastal marine area from port activities in the vicinity of the port structures is proposed to be a permitted activity while other activities not related to port activities are listed as non-complying.

The occupation footprint is similar to that provided for in LPC's existing coastal permit⁶⁷ except that it also includes the areas where the Te Awaparahi Bay berths and the outer Harbour cruise berth may be established. It also includes that area of the Inner Harbour that contains the existing small-craft mooring structures that would form part of the new marina proposed for Dampier Bay.

9.2.2.8 Reclamation

The proposed reclamation in Te Awaparahi Bay is to be located largely within the existing Operational Area of the Port and is already a highly modified part of the coastal environment, being located adjacent to the existing coal stockyard. The conclusions of the baseline assessments (see Section 7) is that reclamation in principle can be constructed at this location but a controlled activity consenting process is required to address designs details, construction techniques, the management of sediment plumes; and the mitigation or enhancement of kaimoana.

It is proposed that the controlled activity consent would go through a limited notification process so that Te Hapū o Ngāti Wheke and Te Rūnanga o Koukourārata has an opportunity to be involved in assessing, and if necessary submitting on, the conditions of consent.

All other reclamation within the Operational Area of the Port would be a discretionary activity.

9.2.3 Other regional plans

There are few changes required to the other regional plans. There are some proposed amendments to the rules in the Proposed Canterbury Land and Water Regional Plan (PCLWRP), which are included in Appendix 29. The discharge of stormwater onto land from any significant earthworks on the hillside is proposed to be listed as a controlled activity with the need for a sediment and erosion control plan. This is consistent with the approach taken in new Chapter Ten of the coastal plan. Another controlled activity rule is proposed on earthworks carried out within, or within the margins of, the small ephemeral stream gullies that occur on the steep slopes down to Te Awaparahi or Gollans Bay⁶⁸. Most of these gullies only flow during high rainfall and so issue is to ensure sediment control measures are put in place where necessary. It is proposed to carry out gully enhancement plantings for the main gullies under a landuse consent that would be required by the District Plan.

The presence of an aquifer on the reclaimed land could potentially trigger the rules in the PCLWP during Recovery works. Given this aquifer is not used by any person it is proposed to list excavation and deposition works as a permitted activity subject to a standard on what can be deposited in or close to the water table.

Any site de-watering necessary for construction works has been listed as a controlled activity. While there is unlikely to be any issues associated with site de-watering there remains an opportunity for conditions to be imposed.

⁶⁷ See authorised under 384A of the RMA.

⁶⁸ LPC already holds a controlled activity consents for earthworks on the hillside (refer to CRC111660 and CRC111662 for example).

The only proposed change to the operative Natural Resources Regional Plan relates to Air Quality. The discharge of dust associated with the Recovery works is listed as a controlled activity so that a dust management plan is prepared. There is a technical chapter on the management of dust in the CEMP.

The rest of the Natural Resources Regional Plan and the Land and Vegetation Management Regional Plan (Part II: Earthworks and Vegetation Clearance – Port Hills) will shortly be replaced by the PCLWRP when it is made operative. Therefore, Port Recovery is exempted from the rules in these plans on the basis that the PCLWRP contains the relevant rules.

9.2.4 Conclusion on the Regional Plans

A number of changes in the provisions of the coastal plan and other regional plans have been identified as being necessary to enable Port Recovery. A new chapter in the coastal plan provides the opportunity for the reader to understand how the provisions fit together to achieve Port Recovery.

Rules have been introduced so Port Recovery can be appropriately expedited while at the same time ensuring that the cultural and environmental well-being of communities is met during the detailed design phase so that adverse effects from the repair, rebuild and reconfiguration works can be mitigated through conditions of resource consent or through the Construction and Environment management Plan.

9.3 BDP/Draft Christchurch District Plan

9.3.1 Overall approach to the District Plan to facilitate Port recovery

The use of land and the associated development of buildings and structures is controlled through the provisions of the Banks Peninsula chapter of the operative City Plan. The majority of the land included within the Recovery Plan boundary has a Lyttelton Port Zone, with associated objectives, policies, and rules. The operative rule package provides for 'Port Activities', with any activities not included within that definition being non-complying. The Port Zone also includes rules on the size and location of buildings and controls matters such as height, recession planes in relation to boundaries with nearby Residential Zones, and the control of glare from lighting, where this is received in adjoining more sensitive zones.

In addition to the Port Zone, the operative Plan also includes 'thematic' chapters that manage matters such as subdivision, transport, hazardous substances, noise emissions, heritage buildings, and natural hazards across the entire District. The operative Plan also includes provisions controlling the establishment of noise sensitive activities within a 'Port Influences Overlay Area' that is identified on the planning maps and that covers the residential, industrial, and commercial areas of Lyttelton Township in close proximity to the Port. The wider township is outside the geographic boundary of the Recovery Plan, and therefore amendments to the Port Influences Overlay Area and associated controls are outside the scope of the Recovery Plan.

The operative rule package has applied to Port activities for the past twenty or so years, and has proven to be generally effective in enabling a wide range of Port activities to occur, whilst concurrently managing the effects of Port activities on the wider area. It is important to note that effects such as dust, stormwater management, and activities on the water are controlled through the various Regional Plans rather than the District Plan. The design and function of the Norwich Quay road corridor likewise sits outside the District Plan process and is instead controlled by the New Zealand Transport Agency which is the Agency responsible for managing the State Highway network.

The City Plan, including the Banks Peninsula Chapter, is being separately reviewed in a process that is running concurrently with the preparation of the Recovery Plan. The City Council has chosen to completely reformat the proposed replacement plan, including the adoption of an 'activities based' rule framework. If this wider review were not occurring, then the amendments to the operative Plan necessary for enabling recovery would be extremely brief, as the operative Plan is generally enabling of Port activities and buildings and few amendments are therefore necessary. Because the review is underway, and therefore no existing District Plan provisions can be relied upon for the purpose of Port recovery, the District Plan provisions that are to be included in the Recovery Plan have been drafted so that they 'stand-alone' as a self-contained regulatory framework for managing activities within the Recovery Plan area. The formatting and layout has nonetheless been based on that proposed in the replacement District Plan so that the two documents have a consistent layout and structure. The level of control proposed in the Recovery Plan provisions is generally a simple continuation of those that have long applied through the operative District Plan, albeit that their format and layout has changed. Where amendment to the level or scope of the regulatory framework is considered necessary for enabling recovery, these changes are discussed in more detail below.

The above approach of making the Recovery Plan provisions 'self-contained' is not proposed to be applied to two topic areas, namely the management of Natural Hazards and Heritage Buildings. Post-earthquake, the management of the risks posed by natural hazards has assumed increased importance and the provisions of the operative Plan are not considered to be effective in reflecting current knowledge regarding hazard risk. The notified District Plan has identified hazard areas across the Port Hills, with several such hazard areas extending into the geographic area of the Port Recovery Plan. It is considered that the most effective process for identifying hazard-prone areas and the sensitivity of the receiving environment in a consistent manner across the Port Hills environment is through the District Plan Review process.

In terms of heritage buildings, post-earthquake there are only a small number of discrete heritage buildings identified by both New Zealand Heritage and the operative Plan provisions as being located within the Port Zone. Whilst some repairs to these structures may be necessary, such works are not integral to recovery nor do they necessitate a regulatory framework that is different to how heritage buildings are managed through the District Plan more generally. As such, the District Plan Review process is again considered to be the appropriate process for determining a management approach to heritage on a consistent basis and can occur without impacting on Port recovery.

As a final comment, it is anticipated that the timing of the replacement of the operative Plan and the finalisation of the Port Recovery Plan will occur at a similar time. This will mean that the current Banks Peninsula Chapter of the operative Plan will cease to exist and therefore no changes are shown to the Banks Peninsula Chapter to reflect the relocation of port-related provisions into the Recovery Plan. In the event that the Recovery Plan is confirmed some time in advance of the wider replacement District Plan becoming operative, then either the Port-related provisions in the Banks Peninsula chapter will need to be deleted, or an explanatory statement added to the Banks Peninsula chapter to the effect that all port-related provisions are now located and addressed in the Recovery Plan.

9.3.2 Objectives and Policies

The objectives and policies of the operative Plan that relate to the Port are proposed to be updated to reflect the post-earthquake recovery context of the Port environment. The proposed provisions identify the importance and role of the Port to the wider region, the need for recovery, the need to manage port-generated effects on the wider community, and the activities and outcomes anticipated in the various parts of the Port area.

9.3.3 Zoning

It is proposed to have a consistent zone across the Recovery Plan area as a Specific Purpose Port Zone⁶⁹. The range of activities that are appropriate across the zone will however vary depending on the differing contexts and functions of the Recovery Plan area. The proposed provisions therefore identify three different areas within the Port Zone where different activities are appropriate and provide specific policy direction as to the anticipated activities and outcomes in these different areas as follows:

1. Operational Area: The majority of the Port Zone is identified as an operational area, where a wide range of port-related activities can occur, with the operational area covering all of the flat land, apart from the following three exceptions:
 - a) Dampier Bay (discussed in more detail below);
 - b) A small block of privately owned land at 9 Norwich Quay which is outside Port or public ownership and therefore is proposed to retain its existing Town Centre Zoning. Whilst from a purely planning perspective it would make sense to include this land within the Port Zone, and the proposed rule package provides for retail and commercial activities to occur within buildings fronting onto Norwich Quay, LPC have been cautious about proposing rezoning of private land outside LPC control through the Recovery Plan process;
 - c) A small public park and nearby restaurant located at the junction of Simeon Quay and Norwich Quay that are both located within public road reserve that is vested with Council and that currently has an industrial zoning.

The operational area covers all of Naval Point, and the permitted 'Port Activities' includes explicit provision for yachting and recreational boat activities and associated clubrooms. Parts of the Naval Point area are under the control of the Christchurch City Council and therefore any activities that occur on Council land will be subject to separate approval of Council as landowner. The proposed rule framework simply permits a wide range of port activities to occur in the Naval Point area in order to provide long-term flexibility as to how this land is used throughout the recovery process and to enable port-related activities to occur (subject to Council landowner approval) such as cruise ship visitor facilities were an outer harbour cruise ship berth to be established. The proposed rule package includes a restriction on Port Activities occurring within the gazetted recreation reserve at Naval Point, within which only recreational activities and facilities can occur. Use of the recreation reserve is managed by the City Council with whom the reserve is vested.

2. Dampier Bay: The Recovery Plan provides for Dampier Bay to transition over time into a publicly accessible waterfront area with a marina and supporting retail and commercial activities.
3. Quarry Area: This third area covers the hill slopes above the Port and below Sumner Road. The only activities anticipated in this area are quarrying and associated haul road formation, rural activities, and ecological restoration.

9.3.3.1 Activities

The operative Plan permits 'port activities' throughout the Port Zone. This term is defined as:

⁶⁹ The zone name is consistent with how other specific purpose zones will be labelled in the replacement District Plan.

Means the use of land, wharves, plant, equipment, buildings and other port facilities and structures for:

- Cargo handling and passengers;
- Port administration;
- Maintenance and repair facilities;
- Ship and boat building activities;
- Warehouses, storage areas and facilities;
- And car-parking areas;

And activities associated with:

- Berthing
- Departure and surface movement of ships

The proposed District Plan is proposing to move to an 'activities based' philosophy where activities are explicitly listed, and if not explicitly defined then they are not permitted. The proposed definition has therefore been amended to ensure that the range of activities anticipated as being potentially necessary as part of Port recovery are included so as to remove any ambiguity as to whether or not they are permitted. The proposed definition is as follows:

9.3.3.2 Port activities

Means:

- a. *Cargo handling, including the loading, unloading, storage, processing and transit of cargo;*
- b. *Passenger handling, including the loading, unloading, and transit of passengers, including passenger or cruise ship terminals and associated facilities*
- c. *Maintenance and repair activities, including the maintenance and repair of vessels;*
- d. *Port administration;*
- e. *Marine trade and industry training facilities;*
- f. *Marine industries, including ship and boat building;*
- g. *Warehousing and distribution activities, including bulk fuel storage and supply and associated pipeline networks;*
- h. *Facilities for yachting and recreational boating;*
- i. *Infrastructure, buildings, structures, signage, utilities, roads, carparking, landscaping, rail, offices and Food and Beverage Outlets associated with and supporting the above activities;*
- j. *Quarrying and haul roads (located within Quarry (Area 3) only), and earthworks associated with and supporting the above activities, including the reclaiming of land;*
- k. *Within Quarry (Area 3) only, rural activities (excluding residential units) and ecological restoration.*
- l. *activities associated with the surface navigation, berthing, manoeuvring, refuelling, storage, servicing and provedoring, of vessels.*

Any proposed activity that does not fall within the scope of the above definition⁷⁰ within the Port Zone or that is otherwise explicitly permitted⁷¹ is proposed to require a resource consent as a fully discretionary activity. This is a change in activity status from the operative Plan which makes non-port activities non-complying. Full discretionary status means that the City Council is able to assess all aspects of a proposal. As such, all relevant matters are able to be considered, and the application can be publicly notified if the effect of it are likely to be more than minor on the wider area. Given the evolving nature of port operations during the recovery period, combined with the activities-based philosophy of the replacement District Plan, fully discretionary status is considered to be more appropriate and more enabling of recovery than non-complying status in that it provides a degree of flexibility for the Port to respond to unforeseen activities and changing circumstances through the resource consent process where all potential issues are able to be fully assessed.

The operative Plan controls on helicopter flights and facilities have been included in the proposed rule package to ensure that the operative controls on such activities are retained. The only amendment to the operative provisions controlling helicopter flights is to include explicit reference to these rules not applying to emergency flights that are responding to a safety incident within the Port Zone.

Quarrying & associated haul roads are proposed to be a controlled activity in the Gollans Bay area, with quarrying limited to only occurring within the footprint of the quarry area that is already covered by an existing resource consent (and as shown in a proposed Appendix to the District Plan). Quarrying is a vital component of Port recovery as a means of providing fill material for the reclamation. Controlled activity status enables quarrying to occur to support recovery, whilst enabling quarry proposals to be assessed through the resource consent process in terms of the adequacy and effectiveness of methods proposed for managing rockfall and slope stability, revegetation of batter slopes and side casting, site rehabilitation and terrestrial ecology management.

9.3.3.3 Building controls

Height

The long-established operative Plan limits the height of buildings and structures across the Port Zone to 15m (20-23m in tank farm). Cranes are excluded from needing to comply with the height limit in recognition of the functional need for such structures and the anticipated nature of these within a port environment. Building height at Naval Point is limited to 12m.

The existing height limits are proposed to be retained, subject to several amendments discussed below. The 15m height limit has operated for some 20 years without giving rise to inappropriate buildings within a Port environment. The terrace along the southern edge of Norwich Quay is some 6- 8m in height, and therefore 15m high buildings, even when built close to Norwich Quay, will generally have the appearance of a two storey building where they are seen above the terrace, with such a height in keeping with the long-established built form in the town centre. The contour then rises steeply from Norwich Quay such that London Street is some 30m above sea level. The topography of the Lyttelton basin means that the construction of new buildings up to 15m in height, whilst visible from the township, will not unduly block views of the harbour i.e. the view will change but will not be obscured. The presence of buildings within the Port Zone are

⁷⁰ Activities within Dampier Bay and with frontage to Norwich Quay are discussed in more detail below.

⁷¹ The proposed rule package also provides for public transport, emergency, and coastguard facilities as permitted activities within the Specific Purpose Port Zone.

an anticipated and long-established component of a working port environment and therefore the existing height limit is proposed to be retained.

Two minor amendments are sought to the height rule to facilitate the recovery of Port operations. The first is that as well as cranes, lighting towers also be exempt from the 15m height limit. The rationale for this exemption is similar to that for cranes, namely that lighting poles have a clear functional need to be the height that they are. Effective lighting is a critical health and safety requirement for port operations, and light poles are inherently slim structures that will have limited effects on views across the working port landscape. The existing operative Plan rule controlling glare from lighting on residential properties is proposed to be retained to ensure that Port lighting does not have unacceptable effects on residential amenity.

The second minor amendment is to exclude container stacks from the height limit. Containers are technically defined as 'buildings' under the proposed replacement District Plan, and therefore stacked containers will be subject to the 15m height limit. The container operations are all located east of the inner harbour adjacent to Cashin Quay. As such the container storage area is not readily visible from the majority of the township (or where it is visible this is as a long view across the working port landscape).

The landscape and urban design assessments have identified that adjacent to the western end of Dampier Bay, the terrace height reduces such that the grade separation between Dampier Bay and a strip of residential dwellings along Godley Quay is less than that typically experienced around the Port edge. The height limit for the western end of Dampier Bay is therefore proposed to be reduced to 12m in order to better manage potential effects on the nearby residential area as Dampier bay redevelops.

The operative Plan has a 12m height limit for buildings located within the Naval Point area. It is proposed that this height limit be increased so as to be consistent with the wider 15m limit across the balance of the Port Zone. The Naval Point area is set well below the adjoining residential areas located above the Brittan Terrace bluffs and therefore a small increase in height is considered to be appropriate for enabling flexibility in the recovery of the Port. It is also important to note that the Naval Point area is largely under City Council control and therefore as landowner Council has the control over the development of new buildings in this area.

Recession planes

The operative City Plan controls on the height and location of buildings within the Port relative to daylight and outlook of nearby residential neighbours are unchanged.

9.3.4 Dampier Bay, Norwich Quay, and relationship with the Town Centre

There has been significant community feedback⁷² that improved public access to the waterfront would be of benefit to the community as part of the recovery of the Port. In responding to this feedback, LPC have identified that improved public access to the waterfront in the Inner Harbour can be provided in a staged manner, as operational activities shift eastwards through the proposed reclamation process. In addition to public waterfront access, the need for a sheltered recreational boating marina has been identified in the recreation report as a beneficial facility for the wider Christchurch area. The potential relocation of the existing Diamond Harbour Ferry terminal to the higher amenity Dampier Bay area and away from operational areas is also

⁷² This feedback has been received through both the City Council-initiated Lyttelton Master Plan process and the community consultation undertaken by the Port in order to inform the development of the Recovery Plan and as set out in the Recovery Plan Consultation Report.

provided for, should ferry relocation proceed. The Recovery Plan therefore identifies Dampier Bay as the location where a recreational marina can be developed, with improved public access to the waterfront and the development over time of associated retail and commercial businesses to support an attractive, vibrant waterfront area. Whilst such development is expected to be commercially viable, the proposed development of this area by LPC and any future commercial partners is primarily in response to community feedback that such a development is what the community want to see for the area.

The regeneration of Dampier Bay is identified as a significant positive benefit of the Recovery Plan for the community in the social, landscape, and urban design reports. All these reports identify that such development will be a significant improvement over the current Dampier Bay environment. Despite this improvement, the reports also identify the need for any regeneration to be undertaken carefully for the associated benefits to be fully realised.

The operative District Plan does not permit retail or commercial activities in Dampier Bay, and neither does it include pedestrian promenades and associated public facilities within the permitted 'Port Activities' definition. The operative Plan likewise does not include any guidance as to how development in this area is to be arranged or where access ought to be provided. To enable the recovery of this part of the Port and the delivery of the associated community benefits, a series of amendments are proposed to the District Plan.

9.3.5 Outline Development Plan

An Outline Development Plan is proposed for Dampier Bay to show the key layout outcomes, including the provision of linkages back to the town centre and to Naval Point, the location of a vehicle access route along the base of the terrace, the establishment of native planting along the terrace edge adjacent to Godley Quay (supported by a separate landscaping rule), the location of a ferry terminal and associated public transport stop (should the ferry terminal be relocated), public access and greenspace located in a convenient manner from Veolas Rd, and public access along the full length of the waterfront. Any development that is not in general accordance with the Outline Development Plan will require a resource consent as a restricted discretionary activity where the potential effect on the key anticipated outcomes can be assessed.

9.3.6 Dampier Bay & Norwich Quay activities

In addition to Port activities, the proposed rule package also permits community facilities such as museums, art galleries, and visitor information services within Dampier Bay, along with office and retail activities. Consistent feedback was received from the consultation process and the various expert reports that a mix of activities was important in providing an attractive, safe, and inviting waterfront area as well as providing a local business environment with a unique context and that is able to support the proposed improved marina facilities and possible ferry terminal. Provision for such facilities and activities within the District Plan rule package is therefore necessary as an integral component in creating an attractive waterfront area as part of the wider Port recovery.

It is anticipated that the timing and extent of commercial development will occur in response to market demand. There are express limits proposed in the District Plan rule package to ensure that any commercial development at Dampier Bay will not have any material effects on the recovery of the Lyttelton Town Centre.

The development of Dampier Bay presents the opportunity to create a complementary area to the existing town centre. Dampier Bay also has the ability to create a new attraction for the wider Christchurch community that increases the number of residents and visitors that are keen to visit Lyttelton, as identified in the recreation and tourism report.

Dampier Bay recovery therefore has the potential to grow the overall size of the retail 'pie' in Lyttelton, rather than compete with the existing town centre, given the anticipated function of Dampier Bay, and conservative limits that are proposed to apply to the extent of retail activities. The purpose of Dampier Bay is to create a complementary environment to Lyttelton Township that is different to its town centre.

In order to ensure that the Recovery Plan does not detract from the town centre in terms of its form, function and amenity, several limits on retailing are proposed.

- The total quantum of retail public floor area within Dampier Bay is proposed to be capped at 1,500m² prior to 2026 to provide the town centre with over a decade to recover without a large amount of retailing being present in Dampier Bay. This threshold is set at a low level so as to provide certainty that a relatively small degree of retailing can occur as of right to support the proposed development of a marina and good quality public waterfront, whilst also not posing any retail distributional risk to the Town Centre Zone that covers some 4.5 hectares. Marine-based trade and yard suppliers such as boat sales and marina/boating equipment providers are excluded from these limits as such activities do not have the potential to compete with town centre retailers which do not include such categories and given the direct association that such activities have with a marina/waterfront location.
- The size of individual retail tenancies is proposed to be limited to no more than 450m² public floor area to ensure that large format retail or a supermarket could not locate as a permitted activity. Such large format activities have the potential to create new 'anchor' attractors that would directly compete with the supermarket anchor on London Street. The proposed threshold of 450m² is consistent with the 'large format' limit established in the Central City Recovery Plan and proposed for the Commercial Large Format Zone in the notified District Plan. The analysis undertaken as part of the wider District Plan Review process is relied upon regarding the suitability of this threshold.
- A limit of two Food and Beverage outlets is proposed for Dampier Bay, recognising that much of Lyttelton Town Centre's retail diversity is contained within this category and therefore reducing the propensity, although unlikely, of the material relocation of this offer from the Town Centre to Dampier Bay.

The town centre, and in particular London Street, does not have (and never has had) large amounts of office floor space. Office development in Dampier Bay is not therefore considered to have the potential to have a significant distributional effect on the town centre and therefore no limits on office floor space are considered necessary.

The range of activities permitted on the south side of Norwich Quay between Norwich Quay and the rail corridor has also been carefully considered. Prior to the earthquakes the south side of Norwich Quay contained a number of commercial buildings, the majority of which have now been demolished as a result of earthquake damage. The land within LPC ownership is proposed to be included within the Specific Purpose port Zone to provide operational flexibility as recovery works and repairs are undertaken. This zoning replaces a strip of Town Centre zone that currently exists in the operative Plan. There has been feedback through both the Lyttelton Master Plan and the Recovery Plan consultation processes, as well as through submissions on the notified District Plan Review process, that some members of the community would like to see commercial activity able to continue on the south side of Norwich Quay as part of the town centre. There are also urban design benefits in enabling commercial activity on both sides of the Quay to facilitate a two-sided main street experience as part of the town centre, whilst accepting the state highway function of the road corridor. In recognition of this community feedback and the operative Town Centre zoning that has existed along a portion of the frontage, it is proposed that retail and office activities be permitted where they are located within a building that has direct frontage to Norwich Quay. As with Dampier Bay it is proposed to limit retail tenancies to no more than

450m² public floor area to avoid large format or supermarket retailers from establishing as of right in this area. It is important to emphasise that over the short-term the priority use of this area is to support the operational recovery and repair of the Port, however it is considered important that the ability to establish commercial activities onto Norwich Quay is provided should such be desired in the medium term and as sought by the wider Lyttelton community. No retail cap on overall floor space is therefore proposed in the Norwich Quay area given that operational use of this area is anticipated during the recovery period. Norwich Quay is also part of the town centre and therefore activities along Norwich Quay cannot have a distributional effect on the centre as it has long been part of that centre.

In combination, these provisions would ensure that a range or scale of commercial activity would not eventuate within the Port Zone to an extent capable of creating significant distributional impacts on the Lyttelton Town Centre, or having a material effect on wider recovery.

9.3.7 Urban design controls on buildings and public space

The quality of future buildings within Dampier Bay, the location of carparking relative to buildings and the waterfront, and the design, quality, and safety of the proposed public open space and waterfront pedestrian promenade have been identified in the social, landscape, and urban design reports as being important elements in delivering the community benefits of a rejuvenated Dampier Bay. Given that Dampier Bay is under the single ownership of the Port, and given the clear expectations of Ministers in the District Plan review⁷³ regarding the level of urban design control, the urban design assessment is proposed to be as a controlled activity where proposals can be assessed and conditions imposed (if need be) on the key layout and design matters.

The south side of Norwich Quay has likewise been identified in both the expert reports and community feedback as a visually sensitive area. The proposed rule package therefore makes any building taller than 8m and located between the rail corridor and Norwich Quay a controlled activity in terms of urban design. The rule only applies to buildings greater than 8m in height as below 8m the building will largely sit below the terrace/level change. Above 8m in height buildings will be more readily apparent when viewed from the Norwich Quay corridor or from buildings and public spaces on the north side of Norwich Quay and therefore their design and massing is subject to assessment.

9.3.8 Noise

As noted above, the operative Plan rules that control the establishment of noise sensitive activities within the Port Influences Overlay Area are outside the geographic scope of the Recovery Plan process. These provisions are to be separately considered through the concurrent District Plan review.

The provisions controlling the emission of noise from within the Port Zone are largely a continuation of the operative Plan provisions, with additional controls proposed to effectively manage the effects of construction phase noise, noting that there is no way of avoiding all noise emissions from construction works whilst still achieving the recovery of the Port. Noise emissions from commercial activities within Dampier Bay and along Norwich Quay (should such establish in the future) are proposed to be subject to the noise provisions that currently apply in the Lyttelton Town Centre Zone and that have been developed to manage the interface of commercial activities that are located in close proximity to residential areas.

⁷³ Fourth Schedule of the Order in Council for the Christchurch District Plan Review

9.3.9 General topic rules

The operative Plan rules relating to traffic generation, parking (no controls within Port Zone), glare/light spill, subdivision, and hazardous substances are all proposed to be continued without substantive change beyond reformatting into the proposed District Plan structure, and with a focus on only those rule elements of relevance to the Port context. These provisions have all operated effectively for some twenty years and no changes are considered to be necessary in order to facilitate recovery.

9.3.10 Other methods

District Plan provisions are only one tool for facilitating Port recovery. The Recovery Plan anticipates a range of other non-District Plan tools will also be used by LPC and other agencies as part of the recovery process. These alternative methods include the following:

- LPC to prepare a Dampier Bay & Norwich Quay design guide (buildings, public realm, pedestrian links, information panels etc.) to guide potential development partners and to inform the detailed design of the public realm waterfront areas and pedestrian linkages beyond the site;
- LPC to prepare a colour guide for cranes within the operational area to ensure the colours are recessive and have low reflectivity values;
- LPC to liaise with NZTA and CCC regarding the pedestrian amenity/streetscape along and across Norwich Quay; liaise with CCC regarding the pedestrian amenity/ streetscape on Council-controlled roads between Dampier Bay and Naval Point;
- Preparation of an ecological rehabilitation and planting strategy for the bluffs and lookout areas above the Operational Area, and native coastal planting along the eastern outside edge of reclamation area once reclamation activities have concluded;
- Archaeological Authority application to New Zealand Heritage for a global consent to modify archaeological sites where necessary for recovery works, and subject to a suite of conditions agreed to by HNZ.

The proposed non-regulatory design guidance for Dampier Bay would be developed in consultation with key stakeholders and would be provided to developers and designers involved in Dampier Bay. Such landowner-led guidance is a relatively common and established practice in commercial development, particularly in a Greenfield context (both residential and commercial), where the developer will produce their own set of 'in-house' controls to ensure development proceeds in a coherent and compatible manner. The guidance would cover new buildings and the public realm, with the objective to reflect the historic and industrial character of the Port, including culturally significant sites and connections. Consideration would be given to building activation, location, height, size, materials (including recycled materials such as wharf timbers), form and colour, as well as signage, car parking, landscaping, public art and lighting. The design of public realm open space and roading/walkway connections would also be included within the guide.

9.3.11 Conclusion

Overall, the existing operative District Plan provisions are generally adequate for enabling the recovery of Port infrastructure and operations. The concurrent timing of the District Plan review with the Recovery Plan process has necessitated the Recovery Plan provisions comprising a 'self-contained' package so that a certain and coherent regulatory framework can be developed. The proposed provisions therefore largely adopt the well-established and effective operative District Plan provisions, albeit that these provisions are reformatted to have a consistent look and feel to the proposed District Plan.

Where changes in regulatory approach have been identified as being necessary, these have generally been limited to enabling operational flexibility across the port zone to enable repairs and recovery works to be undertaken, and have also included a package of controls over Dampier Bay and Norwich Quay frontage areas where greater public access and a wider range of activities are anticipated as part of the overall recovery of the Port and in response to feedback from both expert reports and consultation with the wider community.

10 Statement on Staging and Funding

LPC is focused on building a solid future for the Company and its stakeholders and is in a strong financial position to fund the Port's redevelopment. The Company has experienced good volume growth (more than 40% growth in container trade since earthquakes) and has produced consistently solid financial results for a sustained period. The proposed 30-year redevelopment is projected to cost about \$900 million. The settlement of the Port's earthquake damage claims and resulting insurance payments will provide significant financial support for the redevelopment and resulted in the company achieving a net profit after taxation (NPAT) of \$343.2 million for the 2014 financial year.

Continued strong growth is forecast over coming years as the Port meets the demands of the Regions recovery following the earthquakes, and the needs associated with the forecast strong growth of the regions rural economy.

The Dampier Bay development and Cruise berth are the only two components of the Port Lyttelton Plan that are not planned to be entirely funded by the port. The Landside developments at Dampier will require the input of an experienced developer to realise the full potential of this area. The Port is committed to providing funding required to deliver the basic infrastructure required for this development.

The establishment of a dedicated cruise berth facility is a priority for the port, however given the returns associated with this trade and the high cost of this facility the Port is seeking funding from third parties for approximately half of the estimated \$40 million cost of this facility.

The continued growth of the Port will require investment in supporting networks (road, rail, power) however the Port has no ability to fund the forecast significant investments in regional infrastructure over the next 30 years.

In general terms the recovery of the port starts with the reclamation and progresses into the Inner Harbour as land becomes available and operations can migrate east. The overall program and staging will need to continuously adapt to economic conditions and the changing needs of the port's users. This could result in changes in the priority of projects, changes in sequencing or changes in required delivery timeframes. The most critical aspect to the timing and sequencing will remain the ability to reclaim land in Te Awaparahi Bay. An overall construction program, representing the current thinking, is attached to the report in Appendix 2.

11 Concluding Section

11.1 Minister's Direction

LPC's role is to provide Canterbury Regional Council with all necessary information to enable it to prepare a preliminary draft Lyttelton Port Recovery.

The geographic extent of the Lyttelton Port Recovery Plan is illustrated in Map A attached to the Minister's Direction. Clause 4.2 allows Canterbury Regional Council to include other land or areas within the geographic extent of the Recovery Plan, if it considers necessary after consulting with the parties listed in clause 4.2. As discussed in the description of the recovery projects in Section 2, LPC seeks to extend the geographic extent of the Recovery Plan to include the areas that maintenance dredge and capital dredge operations are undertaken.

LPC considers it has provided the Canterbury Regional Council with all necessary information to enable the preparation of a preliminary draft Lyttelton Port Recovery Plan. LPC also considers it has fulfilled the requirements of the Direction, in particular, regarding:

- consultation, as discussed in Section 4;
- providing all necessary information as required by clause 5.1 on the matters to be addressed by the Lyttelton Port Recovery Plan;
- providing the amendments to documents that are necessary to implement the Lyttelton Port Recovery Plan, as discussed in Section 9;
- providing all necessary information as required by clause 6.5.

The information requirements of clause 5.1 and 6.5 are discussed in more detail below.

11.2 Clause 5.1

Clause 5.1 provides:

- 5.1 The matters to be addressed by the Lyttelton Port Recovery Plan must include, but are not limited to:
- 5.1.1 The recovery of the damaged port, including the repair, rebuild and reconfiguration needs of the port, and its restoration and enhancement, to ensure the safe, efficient and effective operation of Lyttelton Port and supporting transport networks;
 - 5.1.2 The social, economic, cultural and environmental well-being of surrounding communities and greater Christchurch, and any potential effects with regard to health, safety, noise, amenity, traffic, the coastal marine area, economic sustainability of Lyttelton town centre and the resilience and well-being of people and communities including the facilitation of a focused, timely and expedited recovery;
 - 5.1.3 Implications for transport, supporting infrastructure and connectivity to the Lyttelton town centre, including, but not limited to, freight access to the port, public access to the inner harbour and the location of passenger ferry terminals and public transport stops;
 - 5.1.4 The needs of users of Lyttelton Port and its environs, including, but not limited to, iwi, importers and exporters, cruise ship passengers and crew, tourism operators and customers, commercial fishers, recreational users and public enjoyment of the harbour and well-being of communities.

The following table contains a breakdown of the topics that have been assessed and the relevant clause(s) that these topics address.

These topics have been discussed in detail in Section 7.

Table 11.1: Assessments and relevant section of the Direction

Section 7 Assessment	Direction Clause
Economic Effects	5.1.2, 5.1.3, 5.1.4
Effects on Social Values	5.1.2, 5.1.3, 5.1.4
Effects on Recreation	5.1.2, 5.1.3, 5.1.4
Effects on Heritage	5.1.2
Effects on Landscape Character and Visual Effects, including effects of lighting	5.1.2, 5.1.4
Proposed Dampier Bay Development - Effects of urban design and township connectivity	5.1.2, 5.1.3, 5.1.4
Transportation Effects	5.1.2, 5.1.3, 5.1.4
Hydrodynamics – Effects on Currents and Waves	5.1.2
Effects on Marine Ecology: <ul style="list-style-type: none"> • Benthic • Mahinga kai • Marine mammals • Invasive species 	5.1.2
Management of Stormwater	5.1.1, 5.1.2, 5.1.3
Effects on Navigation and Marine Spill	5.1.2, 5.1.3, 5.1.4
Effects on Terrestrial Ecology	5.1.2
Effects on Infrastructure (Electricity, water supply, waste water and lighting)	5.1.1, 5.1.3
Effects of Noise on Noise Sensitive Activities on Land	5.1.2
Effects on Air Quality	5.1.2, 5.1.4
Management of construction activities and construction management plan	5.1.2
Effects on the needs of users of Lyttelton Port and its environs, (iwi, importers and exporters, cruise ship passengers and crew, tourism operators and customers, commercial fishers, recreational users and public enjoyment of the harbour and well-being of communities)	5.1.4

11.3 Clause 6.5

Clause 6.5 provides:

- 6.5 Lyttelton Port Company Limited must provide Canterbury Regional Council with all necessary information to enable preparation of a preliminary draft Lyttelton Port Recovery Plan, commensurate with the scale and significance of the recovery task and the complexity

and interrelated nature of the recovery. This must include information to address the matters in clause 5 of this direction, and must also include, but is not limited to:

- 6.5.1 A port redevelopment plan, clearly illustrating and describing the necessary repair, rebuild, reconfiguration, restoration and enhancement proposals to facilitate recovery, including timing and sequencing of recovery activity;
- 6.5.2 Amendments to relevant instruments considered necessary to facilitate recovery;
- 6.5.3 All relevant technical reports to support proposed amendments to relevant instruments, to the satisfaction of Canterbury Regional Council;
- 6.5.4 A Cultural Impact Assessment;
- 6.5.5 The first phase of an "Impact Assessment", as required by section 7.1 of the Recovery Strategy for Greater Christchurch – Mahere Haumanatunga o Waitaha;
- 6.5.6 An assessment of the proposal against the Canterbury Earthquake Recovery Act 2011, relevant considerations of the Resource Management Act 1991, the New Zealand Coastal Policy Statement 2010, the Mahaanui Iwi Management Plan and other relevant statutory and non-statutory plans;
- 6.5.7 A report on consultation undertaken. That report must list the parties consulted, state how consultation was undertaken, and summarise the information received and how it influenced the preparation of information and redevelopment plans; and
- 6.5.8 A statement on staging and funding of the restoration and enhancement of Lyttelton Port, including implementation of relevant actions to effect recovery.

These matters have been addressed through:

- Clause 6.5.1: redevelopment and enhancement plans are provided in Section 2;
- Clause 6.5.2: amendments to the relevant planning documents are summarised in Section 9 and the relevant changes appended in Appendix 29 and 30.
- Clause 6.5.3: all technical reports are appended to this document.
- Clause 6.5.4: the Cultural Impact Assessment is summarised in Section 5, and appended in Appendix 4.
- Clause 6.5.5: the First Phase of an Impact Assessment is summarised in Section 6 and appended in Appendix 5.
- Clause 6.5.6: an assessment of the proposal against the documents listed in this clause is summarised in Section 8 and covered in the relevant technical reports appended to this document.
- Clause 6.5.7: the consultation report is summarised in Section 4, and appended in Appendix 3.
- Clause 6.5.8: Section 10 provides a statement on staging and funding.

11.4 Conclusion

As provided in the assessment of the project against the CER Act in Section 8, the preparation and approval of a Recovery Plan meets the purposes of the CER Act, particularly given the need for public participation in providing for the focussed, timely and expedited recovery of the Port.

It is also reasonably necessary for the Recovery Plan to be prepared and approved, and in doing so, this would meet the purpose of the CER Act. Ultimately, it is not considered that there is any other means by which the same result can be achieved while achieving an expedited recovery.

It must also be stressed that LPC still anticipates the need to obtain a number of resource consents. The Recovery Plan is however necessary to ensure this consenting process would occur within a more focussed planning framework that anticipates the effects associated with recovery

As set out earlier in this Section, LPC has provided all necessary information to meet the requirements of the Minister's Direction.

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