

CAPITAL & MAINTENANCE DREDGING CONSENTS PROJECT



CAPITAL DREDGING

What is capital dredging?

Capital dredging is an infrequent process, and means the removal of large amounts of virgin material from the sea bed to create, or deepen, a shipping channel in order to serve larger ships.

The capital dredging component of the project remains unaltered from that proposed in 2008. The channel would be extended by appropriately five kilometres further out to sea and depth of the existing channel would be deepened by four metres to allow ships of 14.5 metre draught to access the port at all tides. At present only ships not exceeding a 12.4 metre draught can enter or leave the channel, and only at high tide.



CONSENTING & CONSULTATION

LPC is to lodge the resource consents in early 2013. The capital dredging may not commence for several years after the consent has been granted while maintenance dredging will continue as at present.

LPC is consulting with identified groups and associations, and stakeholders will be kept informed during the process.

BACKGROUND

The bed of Lyttelton Harbour is naturally flat. The depths of the harbour at low water are about 14 metres at Godley Head, 6 metres at the port and then shallows towards the head of the harbour. In order to allow shipping into the port, with a safe margin of water beneath them, a shipping channel has been dredged out over many years, first commencing in 1876.

In response to the trend of international shipping moving into larger ships that are able to carry more cargo, LPC in March 2008 began to prepare a resource consent application to deepen the existing navigation channel into Lyttelton Harbour.

Larger ships require more depth (draught). The current draught of Lyttelton Harbour limits the size of ships which can do business at the port, and deepening the channel will allow access to larger ships. The ability to accommodate larger ships will help the port remain at the forefront of a very competitive local industry. A thriving port provides significant positive benefits to the local economy and associated local industries.

However, the application process was delayed, not least due to the damage to the port caused by the earthquakes. LPC are now recommencing the process to obtain these consents.

At the same time, the existing resource consents held by LPC to maintain the depth of the existing shipping channel are due next year for renewal.

LPC has decided to prepare the resource consent applications for the capital dredging project and the renewal of the maintenance dredging consents as a single project. The resource consent applications will be supported by a single Assessment of Environmental Effects (AEE) that addresses the components of both projects.

CAPITAL DREDGING

How is this different from maintenance dredging?

Maintenance dredging involves removing the silt and sediment that has been deposited in the shipping channel over the course of a year. Maintenance dredging typically happens each year in Lyttelton.

Why is capital dredging necessary?

Deepening the shipping channel will allow bigger ships into port. The international trend is for ships to get bigger, carrying more cargo and thereby reducing the cost per container. To remain a viable and competitive international port we must be able to accept these ships.

Do other New Zealand ports have shipping channels that can accommodate larger ships?

The Port of Tauranga has obtained resources consents to deepen its shipping channel while the Port of Otago is also in the process of obtaining its consents to deepen its shipping channel.

What are the exact dimensions of the capital dredging proposed?

The existing channel ends approximately one kilometre inside the harbour heads, and the proposed capital dredging would extend its length approximately five kilometres (three nautical miles) beyond the harbour heads.

The existing channel would be deepened by four metres; the depth removed from the channel extension would gradually decrease, as the harbour floor tapers naturally downward outside the harbour heads.

The project would include deepening the Cashin Quay turning basin and berth area.

How would the capital dredging be done?

A large dredge will be contracted from overseas. It would cut away the virgin material, suck this material up into the vessel's storage hopper, and then sail to the deposition site, where it will be discharged on to the ocean floor. The currents will disperse any unconsolidated sediment seaward. Once the capital dredging has been done, maintenance dredging will typically occur every year, just as it does now.

How long would the capital dredging take?

It would depend on the size of the dredge used, but it would likely be around six – eight months. The dredge would work 24 hours a day.

How much material will be removed?

Approximately 11 million cubic metres of sea bed material.

Where would the dredged material be deposited?

The proposed spoil site is five to seven kilometres (three to four nautical miles) from Godley Head. It is an area of 2.5km x 5km, and the water at this point is approximately 20 metres deep. Each load of spoil will disperse after deposition and it is expected that any changes in depths would be small, and temporary.

This site was chosen based on scientific evidence which indicates that at this point tidal influences would ensure any mobile sediment was carried out to sea, and not back into the harbour.

Would any of this material be carried back into the harbour or affect the shoreline?

Scientific testing one kilometre shoreward of the trial dumping site indicated that the material would remain in the immediate vicinity of the dumping site. There are no tidal currents that take freshly dumped or mobile material into the bays of Banks Peninsula. Research has reiterated that the currents take the sediment seaward.

Hasn't maintenance dredging contributed to the silting up of the upper harbour, as currents and waves move deposited material from dump sites towards the shore?

The conclusion of the previous research is that the sedimentation of areas of the upper harbour is not due to dredging. The hydrodynamic model verifies the previous investigation work. It is probably the result of land use changes.

Do weather conditions impact on the currents?

Currents observed were not directly impacted by weather, even though there were significant storms during the measurement period.

Will dumping of such large amounts of material elevate the sea bed enough to change the swell dynamics of the area?

Elevations of the sea bed of up to 0.5 metres will not impact significantly on the swell dynamics. The effect of waves upon the sea bed at this site, which is 19 metres deep, is relatively small.



Will there be effects on the biological or marine life of the harbour?

The benthic surveys by Cawthron show that the organisms on the sea floor are tolerant of high suspended sediment levels and able to recolonise relatively quickly, either through larval recruitment or migration.

Previous catch data show that the commercial fish species are widespread, both within the region and along the East Coast of the S.I, and all species are highly mobile. Their distribution will change rapidly with food source availability.

Previous reporting indicates that the Lyttelton Harbour area does not contain any substantial populations of Hector's dolphin and whales are not a frequent visitor. The effects of dredging would not significantly change their habitat.

SCIENTIFIC TESTING

Capital Dredging

The same external experts involved in the previous studies are continuing to lead the investigations. The experts are as follows:

Mulgor (wave and current specialists) is continuing to examine how waves and currents behave both inside and outside of the harbour. Met Ocean Solutions Ltd, in association with Mulgor, has also prepared a hydrodynamic model for the harbour which has been used to verify the earlier measurements of the currents completed using static (sea bed-mounted) and mobile (launch-mounted) Acoustic Doppler Current Profilers (ACDPs) as well as drogues.

OCEL (sedimentation and dredging specialists) has tested and modelled sediment deposition and transport.

Cawthron Institute (marine biology specialists) has studied the floor of the proposed dredging and deposition sites, identifying organisms that live there and assessing the effect of dredging on this marine life. They have also advised on fish and marine mammals.

Maintenance Dredging

The same external experts involved in the investigations for the proposed capital dredging are being used in the maintenance dredging work, and the wave and current investigations carried out for the capital dredging is being used in assessing the effects of maintenance dredging.

However, Mulgor in association with a Canadian specialist and with OCEL, are further investigating how sediment disperses in the outer Lyttelton harbour. The Cawthron Institute is also carrying out further marine biology investigations at Godley Head and are summarising and reporting on the biological monitoring work that has been carried out under the requirements of the existing consent.

Cawthron is also reviewing the levels of contaminated sediment found in the Inner Harbour and whether any special disposal requirements are needed for such sediment.

MAINTENANCE DREDGING

Where is current maintenance dredging deposited?

On the northern side of the harbour in Gollans Bay, Livingstone Bay, Breeze Bay, White Patch North, Mechanics Bay and near Godley Head. These locations will not change.

More recently, the focus of spoil deposition has been at out at Godley Head because the research strongly suggests that overtime the dumped sediment washes out to sea.

Where would maintenance dredging from the new channel extension be deposited?

At the off-shore capital dredge dump site or at the existing Godley Head dump site.

What tonnage of sediment is be deposited in the spoil grounds?

The annual quantities dredged vary from year to year depending on the number and severity of storms. The tonnage of material dredged from the existing channel since 2000 has ranged from approximately 480,000 tonnes to 960,000 tonnes, with the exception being 2009. In 2009 two maintenance dredging campaigns were required due to a run of storms suspending sediment and dumping it back into the channel. That year approximately 1.35 million tonnes of sediment had to be dredged and deposited at the spoil grounds.

Although the existing navigation channel is proposed to be deepened, the rate of in-fill is not expected to appreciably change. The additional quantity of sediment needed to be dredged to maintain the channel extension is estimated to be in the order of 165,000 tonnes though to 325,000 tonnes.

How would the maintenance dredging be done?

An annual campaign is expected for most years and the time required to complete a campaign is determined by the quantity of material that needs to be removed and the size and type of plant used to dredge the sediment.

It is likely that a 'Trailer Suction Hopper Dredge' will continue to be used. The infill sediment would be sucked up into the vessel's storage hopper, and then sail to the deposition site. However, it cannot be discounted that a backhoe or a bucket dredge with a hopper or a separate hopper barge could be used.

A dredging plough (blade) towed by a vessel could be used to level the any humps and hollows on the sea bed within the shipping channel after maintenance dredging has been completed.

A bucket dredge vessel or a land-based bucket dredge, or a land-based suction system or the use of the plough could be used to remove sediment from berth pockets in close proximity to the piles.