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## **Project Next Generation Dredging and Disposal Plan**

### **New Era – Stage 1 Capital Dredging May – Dec 2015**

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		Name	Sign	Name	Sign	Date for Issue
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## 1. Introduction

This document is to be read in conjunction with the Environmental Management Plan (EMP). This document details only the planned **"New Era – Stage 1 Capital Dredging Works"** planned to be undertaken May through December 2015.

The purpose of the dredging is for New Era to remove the sand, silt and clay materials from within the Lower Harbour channel and dispose of them at the consented offshore disposal sites.

Due to the tools and equipment being used and the methodology of work, this work is defined in the consents as **"Incremental Capital Works"**.

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## 2. Summary

<b>PROPOSED COMMENCEMENT</b>	3 <sup>rd</sup> February 2015
<b>ESTIMATED COMPLETION DATE</b>	20 <sup>th</sup> December 2015
<b>DREDGING INTENSITY</b>	Incremental Capital Works
<b>DREDGING PLANT PROPOSED</b> (See attached spec sheets)	Port Otago Ltd TSHD <b>New Era</b>
<b>TARGET DEPTHS</b>	Main Lower Harbour Channel: <b>less than 13.5m</b> Entrance Channel: <b>less than 15.0m</b>
<b>ESTIMATED VOLUME</b>	330,000m <sup>3</sup> .
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## 2.1 Development & Updating of the D&DP

This dredging and disposal plan (D&DP) has been developed by Port Otago Ltd in accordance with Otago Regional Council resource consent condition number 17 of 2010.193, and the requirements within the EMP.

As with the development of the design & execution of the capital dredging works, the D&DP will also be an iterative and evolving process. This D&DP document will be a "live" document - ever developing in response to changes and findings.

The three areas discussed as follows will be the key drivers for change or alteration of the D&DP:-

1. additional dredging & disposal, or construction activity. This will include the specific input from the Contractors(s) with respect to their equipment & methodology.
2. comments or input from Technical Group members and / or Otago Regional Council;
3. input resulting from changes to construction methodology etc... resulting from monitoring and reporting undertaken as part of daily / weekly works.

All revisions of the D&DP will be issued directly to consultative group members, and the most recent versions being displayed on the Port Otago Next Generation website. For incremental capital dredging the updating of the D&DP will be on an as required basis, with the more detailed work program being updated on a monthly basis.

## 2.2 Roles and Responsibilities

As the Principal to the project, Port Otago Ltd has a number of key responsibilities in relation to the development and implementation of the D&DP. In addition with the *New Era* undertaking the dredging works, there are also roles and responsibilities associated with the vessel's crews and staff. The following matrix contains an outline of both these responsibilities.

Role	Responsibility
Port Otago Management	<ul style="list-style-type: none"><li>➤ Development and continued evolvement of the EMP;</li><li>➤ Consultation with affected parties during development, and after implementation of the EMP;</li><li>➤ Implementation and monitoring of the EMP;</li><li>➤ Ensure Port Otago personnel and sub-Contractors have an understanding and awareness of the existence of, and the requirement to adhere to, the requirements of the EMP;</li><li>➤ Ensure timely reporting of all requirements under this EMP;</li><li>➤ Report to key stakeholders any major environmental incidents that may have an impact on the marine environment;</li><li>➤ Exercise due diligence and compliance with the resource consent conditions and EMP;</li><li>➤ Ensure full co-operation with Statutory Authorities in regards to any audits of compliance with Conditions of</li></ul>

Consent and the EMP.	
Port Otago New Era	<ul style="list-style-type: none"> <li>➤ Ensure staff and sub-Contractors have an understanding and awareness of the existence of, and the requirement to adhere to the requirements of the resource consent conditions and EMP;</li> </ul>
Dredging Contractor (future stages)	<ul style="list-style-type: none"> <li>➤ Understand and comply with all instructions from Port Otago Ltd in regard to environmental compliance;</li> <li>➤ Undertake sufficient training of staff and sub-contractors to ensure compliance limits are known and adhered to;</li> <li>➤ Maintain plant and dredging equipment in optimum condition to minimise impact on the marine environment;</li> <li>➤ Undertake regular inspections of all activities and project boundaries to ensure compliance with requirements of the EMP;</li> <li>➤ Carry out work in accordance with best practice to ensure compliance with the EMP;</li> <li>➤ Report all environmental incidents to Port Otago Ltd within limits set in the EMP.</li> </ul>

## 2.3 Key Personnel and Contacts

As required by the EMP and consent conditions the following are key personnel for the project and contact details:

Role	Company	Name	Phone	Email
GM Infrastructure	Port Otago Ltd	Lincoln Coe	DDI 03 472-9884 Cell 021 2298884	<a href="mailto:lcoe@portotago.co.nz">lcoe@portotago.co.nz</a>
Contract Manager – <b>New Era</b>	Port Otago Ltd	Rebecca McGrouther	DDI: 03 472 9716 Cell 021 627 188	<a href="mailto:rmcgrouther@portotago.co.nz">rmcgrouther@portotago.co.nz</a>
Harbour Control	Port Otago Ltd		DDI: 03 472 9882	<a href="mailto:harbourcontrol@portotago.co.nz">harbourcontrol@portotago.co.nz</a>
Otago Regional Council	ORC	Pollution Hotline	0800 800 033	To report oil or fuel spills in the harbour.

### 3. Project Construction Activities

#### 3.1 Introduction

The majority of the Stage 1 capital dredging works will be undertaken using Port Otago's TSHD **New Era**. See Appendix 1 for a brief specification sheet for New Era.

The New Era will be deployed primarily to capital dredging works during the Stage 1 works, and only undertake essential maintenance works, or maintenance dredging that occurs as a consequence of capital dredging in certain areas.

The other work undertaken as part of the Stage 1 works is the Backhoe Dredging works undertaken by Heron Construction Ltd. This work is described in greater detail within a separate Dredging & Disposal Plan.

#### 3.2 Dredging – locations, materials & methodology

The **New Era Stage 1** works includes areas located along the full length of the channel from the Entrance to the Port Chalmers Swinging Basin. The target depths for the completion of Stage 1 are 13.5m inside the harbour, and 15.0m depth outside the harbour in the Entrance Channel. These areas have some material above the currently permitted 13m depth; however, the majority of material in these areas is currently between 13m and 13.5m.

Attached as Appendix 2 is drawing dwg11515 of the Lower Harbour which identifies following:-

- Shaded pink are areas of the harbour that will dredged as part of the Stage 1 works by either New Era, or the backhoe dredge.
- Tabulated on the top left corner of the drawing, are the dredging claims with details of the estimated volumes to be dredged in that area of the channel.

The majority of the materials to be dredged are expected to be sand, with some silt and a small amount of clay possible.

The dredging methodology or way the dredge operates will be very similar to normal maintenance dredging works. The New Era will work over the dredge claim excavating the material off the seabed and pumping the material into the hopper of the dredge where it settles out. The excess water is overflowed. When the hopper is full and a full payload of material has gained the dredge sails to the disposal site where it opens the hopper and the material falls the seabed within the disposal site.

#### 3.3 Disposal

Disposal of dredged material for the "**New Era - Stage 1**" will be undertaken in accordance with the relevant consents and their conditions, as follows:-

1. The majority of the disposal will be to the A0 offshore site (Consent 2010.198). This will occur only after the site can receive material with the turbidity monitoring buoys in place
2. Some disposal, within the limitations of the consents will be to the inshore disposal sites at Heyward Point and Aramoana sites (Consent RM11.153).
3. Disposal of "selected" maintenance dredging materials only to Shelley Beach (Consent RM11.153).

Factors which will influence the choice of disposal site on a daily / weekly basis are:-

- Consent conditions
- Material type
- Sea state conditions and safety of vessels
- Vessel navigation

### **3.4 Dredging and Disposal Records**

In accordance with condition 22 in 2010.193 and Condition c4 in App 1 for consent 2010 .198, records of dredging and disposal activity are required.

The following information is collected and logged aboard *New Era* to enable reporting:

- Vessel
- Source of dredge material (ie claim)
- Start point / location (GPS) of source material
- Start date and time of dredging
- End point / location (GPS) of source material
- End date and time of dredging
- Approximate volume of material
- Material splits (%age of silt, sand, rock)
- Date and time of disposal
- Disposal spoil ground (ie Heywards, Shelly, Spit, A0)
- Location (GPS) of disposal
- Vessel speed and heading during disposal (A0 only).

This information and these logs will be similarly applied and used for all dredging equipment and/or Contractors who are used in the future.

### **3.5 Timing of Works / Hours of Work**

The dredge will work not more than 100 hours per week on average. Two (2) crews will be employed and working 12-13 hour shifts, over a 4 day period. The dredge will therefore work 24hrs per day with layup and vessel maintenance occurring on the other days.

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## **4. Construction Programme**

For the purposes of this D&DP, it is not intended to present a fully detailed construction program.

The actual physical location of the dredging works will vary on a day to day basis dependent on a number of variables. These variables include:-

- Sea state, climatic conditions, tide height & times;
- Dredge material and productivity encountered;
- Shipping schedules;
- Environmental and Consent restrictions, including response to turbidity.
- Maintenance dredging commitments or demand.

A more detailed schedule & program will be prepared on a monthly basis, showing the planned work and expected material types. The New Era is out of port on her annual Lyttelton dredging campaign for the months of September and October. It is expected that New Era will return to Otago Harbour in early to mid November. These updates will be uploaded to the website and circulated to consultative group members.

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## 5. Environmental Aspects

### 5.1 Relevant Consents

The following consents are applicable to the **New Era** dredging & disposal

- RM 11.153 – Disposal of material to inshore disposal sites
- RM2010.193 – Capital Dredging, disturbance of sea-bed.
- RM2010.195 – Capital Dredging, discharge and turbidity.
- RM2010.198 – Disposal of dredged material offshore at A0.
- RM2010.194 – Maintenance Dredging, disturbance of sea-bed
- RM2010.196 - Capital Dredging, discharge and turbidity.

### 5.2 Environmental Restrictions

The applicability of the following conditions from Consent 2010.193 are as follows:-

- Condition 7 currently NOT APPLICABLE.  
Works are not between period 20 Dec to 10 Jan
- Condition 9 - currently NOT APPLICABLE.  
Only applies to Major Capital Works
- Condition 8 – currently NOT APPLICABLE – Taiaroa Head restriction  
Programming of dredging works is required to ensure that no dredging is undertaken in this area between 1 Oct to 30 Nov and 1 Jan to 14 Feb.

### 5.3 Turbidity

The purpose of the harbour turbidity monitoring at the six monitoring sites prescribed in consent 2010.195 condition 4 is to detect unexpected changes in the intensity and/or extent of turbidity caused by the capital dredging works.

Harbour turbidity monitoring for the “New Era – Stage 1” will be undertaken in accordance with consent 2010.195 and conditions 7, 8, and 8A. Pages 16-20 of the current EMP also contain the relevant information.

The actual turbidity limits vary depending on the site, however, the response levels are set as follows:

- Response Level 1 (6 hourly average)
- Response Level 2 (6 hourly average)



- Environmental Limit

Management actions are in place if the turbidity response limits set by the consent are exceeded, and will be strictly adhered to. This monitoring and management will continue for the duration of all capital dredging.

During the Stage 1 Capital Dredging, the data from the harbour turbidity monitors will show if the Response Levels have been exceeded, and hence whether dredging methods or locations need to be altered or changed.

Similarly the ETL at the offshore disposal site A0 will be monitored by Buoys A & B whilst disposal activity is being undertaken at that site. This is in accordance with consent 2010.198.

#### Specific discussion – New Era dredging locations & relevant turbidity sites

Given the dredging locations are interspersed along the full length of the Lower Harbour, **ALL** of the turbidity monitoring sites are relevant to the New Era's operation.

The Entrance Channel is outside the enclosed harbour, and dredging activity in this area does not enter the mouth of the harbour and therefore potentially affect any of the turbidity monitoring sites or sensitive habitats and species that they are in place to protect. The entrance area is therefore an area that can be dredged whilst having no impact or effect on turbidity within the harbour.

Specific dredging claims will influence the turbidity being received at respective monitoring sites. The direct cause and effect relationships between dredging activity in certain locations and the turbidity being received will be knowledge that is gained as dredging work and monitoring proceeds.

#### Specific discussion – management actions

If New Era dredging work in any material is found to be contributing to the turbidity monitors response levels or Environmental limits being exceeded at any of the monitoring sites, then all of the following management actions should be considered.

- Move to dredging at the Entrance
- Relocate dredging to areas not affecting that turbidity monitor.
- Restrict or cease overflow of the hopper
- Reduce dredging frequency
- Suspend dredging

#### Specific discussion – other turbidity monitoring

It is suggested that visual monitoring of the dredging at the Entrance is undertaken within the first 4 weeks of work commencing to establish and confirm nature of the discharges, and appropriateness of the anticipated effects and management action responses. The purpose of this monitoring is to confirm that the work does not cause any turbidity from dredging to be entrained into the harbour on the flood (or incoming) tide.

No other monitoring, such as plume monitoring or mobile turbidity monitoring is proposed.

## **APPENDIX 1: DREDGING EQUIPMENT SPECIFICATIONS**

### Split hopper trailer suction dredger “NEW ERA”



#### Details of “NEW ERA”:

Length overall	58.3 metres
Beam	11.0 metres
Light draft approx	1.4 metres
Loaded draft approx	3.6 metres
Loaded displacement	1840 tons
Load	1200 tons
Hopper capacity	-sand 600m <sup>3</sup>
Hopper capacity	-silt 750m <sup>3</sup>
Speed	8.5 knots
Built	1983/84 by Sims and Dunedin Engineering & Steel Co Ltd

Time to dredge load varies with material; averaging about 1 hour for running sand to 3 hours for sand and silt mixtures. Crew comprises a Dredgemaster, and engineer, and two deckhands who operate the dredge pump.

“NEW ERA” is a suction dredger of the trailing type used to maintain depths in the channels throughout Otago Harbour, and out to the fairway buoy off Taiaroa Head. At the time of building, it was the largest steel vessel built in New Zealand.

“NEW ERA” is powered by two Cummins KTA 1150 diesel engines of 699kw power, driving through twin disc clutches into Shottel prop’ units: these units allow the propellor to rotate through 360 degrees for precision positioning, which is further enhanced by use of the bow thruster.

Electricity is provided by two Kohler Generator sets, each 75 KVA in after engine space. A forward engine space houses a 12V92 Detroit engine, which generates power for the submersible dredging pump, and 6V71 Detroit engine for the bow thruster.

The bridge and operations room has a full range of equipment for finding position, including DGPS as well as radar, echo-sounder, and track-plotter with marine radios and connection to the shore telephone system.

## **APPENDIX 2: DREDGING PLAN & PROGRAMME**

New Era - Capital Dredging to 13.5m - Stage 1

Claim / Area	Depth	Estimated Dredge Volume (m3)
Entrance	15	60,000
Howlett	13.5	3,000
Harington	13.5	15,000
Cross Channel	13.5	37,000
Taylers	13.5	52,000
Pulling Point	13.5	11,000
Hamilton	13.5	19,500
Acheron Head	13.5	8,500
Deborah	13.5	43,000
Swing Basin	13.5	75,000
TOTALS		324,000

M	Claims marked "M" are maintenance dredging claim (areas) that are also likely to be dredged at times during the capital dredging works.
*	Areas on the plan shown as pink are those dredge claims between the channel toelines to a depth of 13.5m or 15.0m below Chart Datum

