Appendix F:

4Sight Maintenance Dredging Annual Sediment Quality Monitoring Reports

4SIGHT CONSULTING

LAND. PEOPLE. WATER.

Eastland Port

MAINTENANCE DREDGING
ANNUAL MONITORING

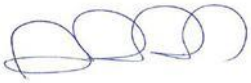
For Eastland Port Ltd

Sediment Monitoring and Elutriate Testing

April 2017

REPORT INFORMATION AND QUALITY CONTROL

Prepared for:	Eastland Port Limited

Author:	Mark Poynter Principal Ecologist	
Reviewer:	Christine Oakey Environmental Management Consultant	
Approved for Release:	Aaron Andrew Managing Director	

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1 INTRODUCTION

Eastland Port hold a resource consent issued by Gisborne District for maintenance dredging (CR-2015-1068586-00 and CD-106583-106584). The consent is included as Appendix A. The consent requires monitoring which is identified below.

Sediment sampling

Condition 8(a) of the consent requires

'*…that the consent holder shall, annually in February or March, arrange representative sampling and analysis of metals and a metalloid (arsenic) within sediments to be maintenance dredged. The sampling shall be related to the exposed port navigation channel and the more sheltered vessel turning basin and wharf berth pocket area [and] generally involve the three sites shown in Plan A. A Standard Operating Procedure(SOP) for the sampling and analysis is to be provided to the Council before the work is undertaken*.'

Consent Condition 8(b) identifies the nine metals/metalloid to be tested as arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver and zinc and establishes that the suitability of sediments for offshore disposal are to be assessed against the ANZECC 2000[1] Interim Sediment Quality Guidelines Low Trigger Values as expressed in Table 3.5.1 of ANZECC 2000. These reference values are also the consent limits and are presented in Table 1.

The SOP is attached to this report as Appendix B.

Consent Condition 8(e) requires a report of the sediment results to be prepared by an independent contractor (in this case 4Sight Consulting) and provided to the Consent Holder, the Council and the Port Community Liaison Group.

This report presents and discusses the 2017 sediment results from samples collected in March 2017. It has been prepared by 4Sight Consulting and has been provided to Eastland Port in the first instance.

Elutriate Testing

Consent Condition 9(a) requires

'*…the consent holder shall once every three years, in February or March, as part of the sediment sampling in the vessel turning basin and berth pocket areas, arrange for an elutriate test of metals to be carried out by a registered analytical laboratory…*

An elutriate test is used to investigate what happens when sediments are removed from the seabed and exposed to aerated seawater. The test involves agitation of the sampled sediments under controlled laboratory conditions then filtering and testing of residual liquid for target contaminants. This testing procedure simulates what happens during a dredging process as sediment is disturbed and lost to the water column during the excavation process.

Condition 9(b) identifies the testing is to include the sediment (as sampled at the port), the local seawater (collected from the port at the time of sampling) and used as the elutriation fluid, and the filtered elutriates which provide a measure of the contaminants potentially generated into the water column.

An SOP for the elutriate testing is also required and is attached as Appendix C.

Consent Condition 9(c) identifies the parameters to be tested in the seawater and the elutriate as the same as noted above for the sediments but with both valent forms of chromium to be tested (Cr III and Cr VI). Results are to be assessed against ANZECC 2000 Marine Water Quality Guidelines at the 95% level of protection (refer Table 3.4.1 of ANZECC 2000).

[1] *Australian and New Zealand guidelines for fresh and marine water quality. Volume 1, The Guidelines*. Australian and New Zealand Environment and Conservation Council, Agriculture and Resource Management Council of Australia and New Zealand

2 SAMPLING CARRIED OUT

Sampling locations are identified in Figure 1. It is noted that the navigation/mid channel site could not be sampled due to the presence of the Pukunui dredging that area at the time of sampling.

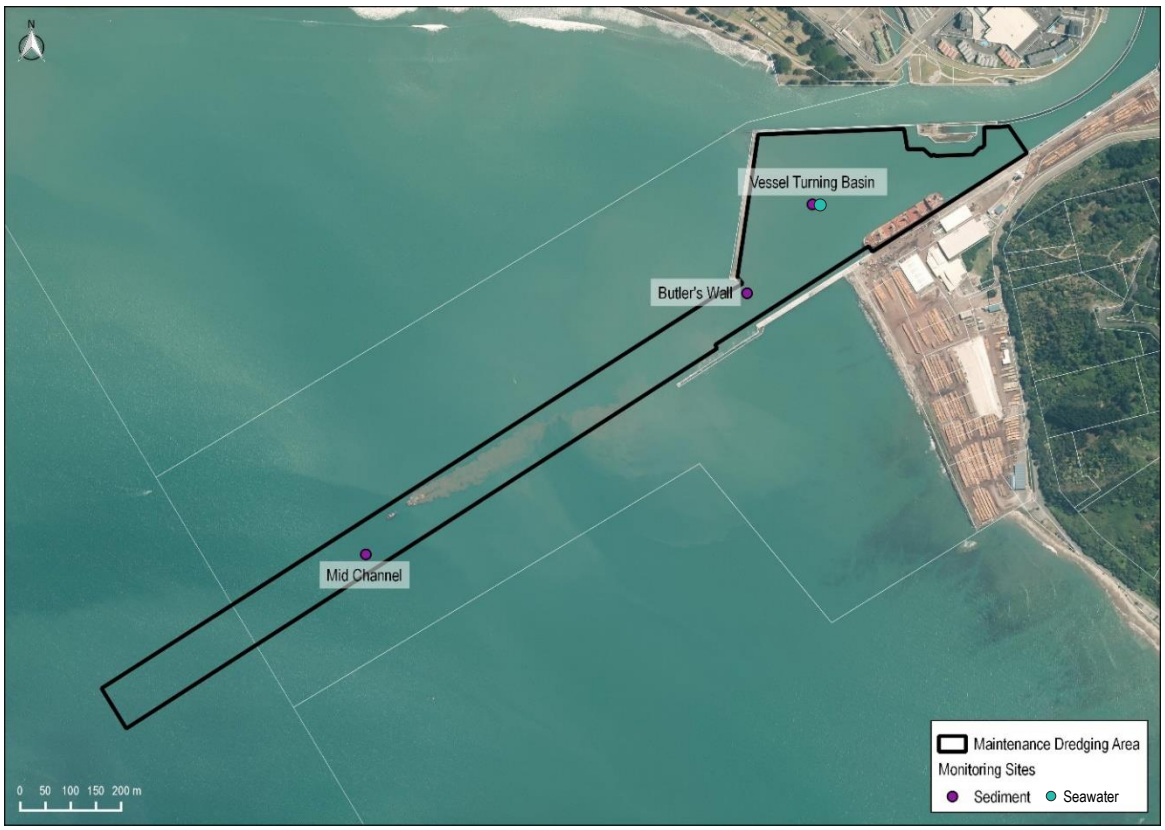


Figure 1: Sampling locations

Sediment sampling was carried out by 4Sight Consulting on 07 March 2017. Seabed samples were collected using a stainless steel biological box dredge towed behind a small boat. A typical seabed sediment sample is shown in Figure 2. The required material for analytical purposes is extracted from the bulk sample collected from each site.

Sampling was carried out as part of a wider seabed sampling effort on that day, which included sampling the inner harbour marina area (in relation to Eastland Port's Upper Log Yard consent monitoring requirements which are reported separately) and sampling elsewhere adjacent to the Turning Basin (in relation to a small area of proposed capital dredging for which a consent application is currently in preparation).

All seabed samples were secured in containers supplied by Hill laboratories and were dispatched to Hill Laboratories along with the seawater to be used in the elutriate testing.

Chain of Custody documentation is included as Appendix D.

Figure 2: Typical box dredge seabed sample

3 RESULTS

Results for the sediment and elutriate testing components of the work are presented below. Full analytical results are presented in Appendix E.

3.1 Sediment

Sediment testing results covering the period 2006 to March 2017 are presented in Table 1. As shown in Table 1, all parameters tested in 2017 fell below the applicable ANZECC 2000 ISQG-Low Value. Nickel was the only value tending close to the ISQG-L trigger, but it was still below that reference value.

Although not required explicitly by the consent condition, the sediments were also tested for total petroleum hydrocarbons (TPH). All TPH values were low and below analytical detection limits.

Table 1: **Sediment** metals concentrations from annual monitoring within the Turning Basin, adjacent Butlers Wall and the Navigation Channel sampling sites over the period 2006 to March 2017 (Shaded grey). Results are compared with consent limits/ANZECC 2000 Interim Sediment Quality Guideline-Low values. (All values mg/kg)

Turning Basin	2006	2008	2012	2013	2014	2017	Consent Limits
Arsenic	nv	nv	nv	nv	nv	6.6	20
Cadmium	0.12	0.07	0.07/0.079	0.085	0.073	0.079	1.5
Chromium	22.1	19	13.9/16	16	10.6	17.5	80
Copper	15.7	12	11.2/14.9	15.3	12.3	18.1	65
Lead	10.3	7.9	7.9/9.6	8.6	9.1	9.2	50
Mercury	0.06	0.047	0.04/0.059	0.046	0.036	0.059	0.15
Nickel	nv	nv	nv	nv	nv	19.0	21
Silver	nv	nv	nv	nv	nv	0.07	1.0
Zinc	63.5	48	47/57	60	56	59	200
TPH	nv	nv	nv	nv	nv	<110	nv
Butlers Wall	2006	2008	2012	2013	2014	2017	
Arsenic	nv	nv	nv	nv	nv	7.0	20
Cadmium	nv	nv	0.089/0.094	0.071	0.068	0.084	1.5
Chromium	nv	nv	16.1/16.2	13	12.9	18.6	100
Copper	nv	nv	12.4/12.6	10.8	10.7	18.5	65
Lead	nv	nv	9.7/10	7.4	7.4	9.9	50
Mercury	nv	nv	0.06/0.046	0.34	0.053	0.07	0.21
Nickel	nv	nv	nv	nv	nv	19.8	21
Silver	nv	nv	nv	nv	nv	0.08	1.0
Zinc	nv	nv	53/55	49	49	61	200
TPH	nv	nv	nv	nv	nv	<110	nv
Channel	2006	2008	2012	2013	2014	2017	
Arsenic	nv	nv	nv	nv	nv	nv	20
Cadmium	0.03	0.031	0.024/0.025	0.029	0.041	nv	1.5
Chromium	10.4	8.7	8.5/8.8	9.9	10.9	nv	100
Copper	4.6	3.9	3/3.1	5.7	6.7	nv	65
Lead	14.8	4.1	4.7/4.7	5.5	6	nv	50
Mercury	0.02	0.015	0.021/0.018	0.036	0.030	nv	0.21
Nickel	nv	nv	nv	nv	nv	nv	
Silver	nv	nv	nv	nv	nv	nv	
Zinc	35.2	28	31/30	36	41	nv	200

3.2 Elutriate

3.2.1 Seawater

Seawater collected from the Turning Basin was used in the elutriate testing on sediments sampled from the Turning Basin and the Butlers Wall. Results are presented in Table 2. All results are below analytical detection level except for total copper which was recorded at a concentration of 1.7 µg/l which is above the consent limit of 1.3 ug/l, being at the ANZECC 95% protection level. It is noted that the seawater sample was collected on the approximate consented mixing zone boundary applicable to the southern log yard stormwater discharge (a 50m radius from the stormwater outlet) which had been discharging strongly over the previous 24 hrs.

It is noted that through an oversight, mercury and silver were not measured in either the seawater or the elutriate.

3.2.2 Elutriate

Elutriate values were generated for the Turning Basin and Butlers Wall sediments, and are also presented in Table 2.

The Turning Basin elutriate values were below analytical detection except for arsenic and copper. There is no marine arsenic trigger value provided in ANZECC 2000.

The elutriate copper concentration was 1.9 ug/l which is also above the ANZECC 95% protection level of 1.3 ug/l. Thus, in this case there was an increase in copper concentration relative to 'background' (1.7ug/l) but this was small (0.2 ug/l).

The Butlers Wall elutriate values were below detection for all values except for arsenic which showed a similar concentration to the Turning Basin value.

Table 2: **Elutriate** results from within the Turning Basin and adjacent Butlers Wall sampling sites for March 2017. Results are compared with consent limits/ANZECC Marine Water Quality Guidelines at the 95% level of protection. (All values µg/l)

	Turning Basin		**Butlers Wall Elutriate**	Consent Limits (µg/l)	Comment
	Seawater	**Elutriate**			
Arsenic	<4.2	18.7	18.1	nv	
Cadmium	<0.21	<0.21	<0.21	5.5	
Chromium	<1.1	<1.1	<1.1	27.4/4.4	Cr III and Cr VI
Copper	1.7	1.9	<1.1	1.3	
Lead	<1.1	<1.1	<1.1	4.4	
Mercury	nv	nv	nv	0.4	
Nickel	<7.0	<7.0	<7.0	70	
Silver	nv	nv	nv	1.4	
Zinc	<4.2	<4.2	<4.2	15	
TPH	<700	<700	<700	nv	

4 DISCUSSION

4.1.1 Sediment

The 2017 sediment sampling results are all below the applicable ANZECC 2000 ISQG-Low values and are thus compliant with Condition 8 (b) of the consent.

Results are also consistent with, and fall within, the range of values previously reported for each parameter.

4.1.2 Seawater

Metal concentrations in the seawater are required to be assessed against the ANZECC 2000 95% species protection level as specified in Consent Condition 9(c) and as detailed in Table 2.

All values in the seawater sampled are low except for the copper which is marginally above the consent (ANZECC) 95% protection trigger (1.3 µg/l). It is noted that since the granting of the maintenance dredging consent in 2015, further consents granted to Eastland Port for stormwater discharges, and the southern logyard discharge in particular (ref consent CD 2015-104664-01), have applied a 90% protection trigger value to this water at or beyond the consented 50m mixing zone boundary adjacent to the southern log yard stormwater discharge. That 90% protection value is 3 µg/l and the sampled seawater at 1.7 µg/l would be compliant with that value.

At face value, **seawater** collected for the elutriate testing (sampled at the consented approximate 50m mixing zone boundary for the southern log yard stormwater discharge), was non-compliant in respect of copper when compared to the ANZECC 95% species protection value specified in the maintenance dredging consent. However, the seawater was tested for total copper, whereas the consent in using ANZECC, anticipates a dissolved copper value. Other monitoring of the port has consistently shown that dissolved copper values are considerably lower than total copper. On this basis, it is likely the local seawater on the day of sampling was compliant with the intent of the consent requirements

4.1.3 Elutriate

Metal concentrations in the elutriate are also required to be assessed against the ANZECC 2000 95% species protection level as specified in Consent Condition 9(c) and as detailed in Table 2.

All values in the elutriate are low and are the same as recorded for the local seawater except for copper. That value increased marginally in the elutriate to a value of 1.9µg/l. That value is above the consented value, but as noted above would comply with more recent water quality requirements for this location.

5 CONCLUSION

Sediment heavy metals recorded low values in the March 2017 sampling. Concentrations are compliant with consent thresholds and are consistent with the range of values previously reported.

It is concluded that the sediment testing confirms the suitability of the material for offshore disposal.

The seawater would meet quality expectations in respect of copper (total and dissolved) if compared with southern log yard stormwater discharge consent.

The **elutriate** testing suggests that the maintenance dredging may cause a small increase in copper concentration in the water column but the concentrations of other metals are unaffected. The increase in copper is small and while it causes a slightly greater exceedance relative to the 95% species protection trigger it remains within the 90% species protection threshold.

It is noted that the elutriation procedure requires filtering (or centrifuging) to separate the solid from the aqueous phase. The filter is about 1.7um rather than the 0.45um that would be used if dissolved metals were to be tested. This may limit the difference between dissolved and total metals in this case.

It is concluded the elutriate testing confirms there should be no significant adverse water quality effect on metal concentrations in the water column due to the dredging.

As noted, the seawater and the elutriate were not tested for mercury or silver. Given the low values recorded in the sediment for these metals, it is unlikely the elutriate would have generated a concentration of water quality interest for either metal.

6 RECOMMENDATIONS

The following recommendations are made with respect to future sampling:

I. Total and dissolved metals should be measured in the background seawater and elutriate testing.

II. Mercury and silver are to be included in the future water tests for both the seawater and the elutriate. These metals were unintentionally omitted in the lab specification for heavy metals analysis.

Appendix A:

Resource Consent

Report on Limited Notified Resource Consent (Regional) and decision

Applicant:	Eastland Port Limited
Subject:	CD-2015-106583-00: Marine Dumping permit to dispose of up to 140,000m3 of maintenance dredge material annually to the port outer spoil disposal ground. CD-2015-106584-00: Discharge of up to 140,000m3 of maintenance dredge material annually to the port outer spoil disposal ground. CD-2015-106585-00: Discharge of decant water from maintenance port dredging within the Port Navigation Channel, Vessel turning basin, wharves 7 & 8 and to disposal at the Port Outer Disposal ground. CR-2015-106586-00: Maintenance dredging up to 140,000m3 per annum within the Port navigation Channel, Vessel Turning Basin and wharves 7 & 8. DA-2015-106587-00 Noise emissions
Location:	Port Management Area
Legal Description:	Coastal Marine Area, Lots 2, 6 and 7 DP7819
Status:	Bundled consents Discretionary
Date:	June 30th 2015
Reporting Officer:	Dennis Crone

1.0 INTRODUCTION

Eastland Port Limited (EPL) has applied to renew consents associated with continuing maintenance dredging operations for the port navigation channel, vessel turning basin and Wharves 7 and 8 areas at the Port of Gisborne. During dredging, decant water will be discharged to the Port Navigation Channel, Vessel turning basin, wharves 7 & 8 and Outer Disposal ground, dredge material, in the main will be disposed of to the Port Outer Disposal ground. As a result of the dredging a maximum volume of 140,000m3 of maintenance dredge material will be disposed of annually to the Outer Disposal Ground.

LOCATION

Maintenance dredging will take place in the port navigation channel, vessel turning basin and Wharves 7 and 8 area at the Port of Gisborne as highlighted in Figure 1 below. This area is Council owned seabed part of the Port Management Area of the coastal plan legally described as Lot 7 DP 7819 and the Coastal Marine Area adjoining Lot 2, 6, and 7 DP 7819.

The maintenance (and capital) dredge material has for a number of years been disposed of at the Outer Disposal Ground, which is about 2km offshore to the south-west of the port. The general location of the disposal ground in relation to the port and proposed maintenance dredging ground is shown below.

Figure 1: (From application) Location of dredging (Light green) **and Outer Spoil Disposal Ground** (darker green)**.**

The Outer Spoil Disposal Ground comprises an area of approximately 3km^2. Water depths in the area are in the order of 18-20 Below Chart Datum (BCD). A review of past reports indicates the disposal ground was chosen for the following reasons:

- The site is close to the mouth of the Waipaoa River and has a naturally muddy surficial seabed lithology;
- The muddy based benthic ecology is relatively sparse and of no particular significance;
- There are no reefs nearby and the area is not used significantly for fishing or other recreational boating activities; and
- The general direction of sediment transport in the area tends to be offshore which reduces the likelihood of material re-entering the port or affecting any of the beaches in the Gisborne area.

The Outer Spoil Disposal Ground is recognised as such in the Coastal Plan and particular rules apply to dredging disposal activities. The Outer Spoil Disposal Ground is located within part of the CMA which has no title and is effectively managed by the Crown, through the Department of Conservation.

EXISTING COASTAL PERMITS

The coastal permits held by EPL for maintenance dredging of the port navigation channel (PNC), the vessel turning basin (VTB) and Wharf 7 and 8 area were issued in August and September 2000. They had 15 year terms and will expire in August and September 2015.

The permits were issued by the Minister of Conservation, as Restricted Coastal Activities (RCA's), some after consideration by the Environment Court, hence the different expiry dates. There are four coastal permits these being:

 CP 198011 for maintenance dredging of the port navigation channel, turning basin and wharf area;

 CP 198013 for discharging dredged material to the coastal waters around the outer spoil disposal ground;

 CP 198015 for depositing dredged material on the outer spoil disposal ground; and

 CP 198018 for dumping the dredged material at the outer spoil disposal ground.

EPL also hold a coastal permit (CP-2013-105825-00) for maintenance dredging of the Wharf 4, 5 and 6 berths and disposal of the maintenance dredge material at the Outer Spoil Disposal Ground.

The consents for discharge/disposal of the maintenance dredge material have a number of conditions (many of which are common to several of the permits) attached to them. They relate to the following matters:

- The maintenance dredge material was to be 'evenly discharged and spread' over the disposal site and 'not concentrated'. Each dredging barge disposal track over the disposal ground was to be logged and copy of the log provided to the Council by 31 October each year (Condition 2 of CP 198013);
- After reasonable mixing there is to be no conspicuous change to the colour of the surface waters and after six (6) hours of the last discharge of each dredging run (Condition 3 of CP 198013);
- Annual sampling and analysis of six heavy metals (cadmium, chromium, copper, lead, mercury and zinc) within the sediments from representative sites within the turning basin with the results provided to the Council by 31 October each year. The analysis approach and limits for the heavy metals are also set out in conditions (Conditions 6 & 7 of CP 198018);
- Annual hydrographic and side scan sonar surveys of the outer disposal site with the results provided to the Council by 31 October each year (Condition 4 of CP 198018);
- 'Baseline' and then 5 yearly in faunal sampling of sediments from 40 sites within the disposal ground and 40 sites in the surrounding area with the results provided to the Council by 31 October each year (Condition 5 of CP 198018); and
- Establishment and operation of Port Dredging Liaison Group of community interests and associated reporting procedures to the Council (Condition 10 of CP 198013 & CP 198018).

In 2000 EPL also obtained additional coastal permits (CP 198012 and CP 198019) to dispose of maintenance dredge material at a proposed 'near shore' (or 'inner') disposal site. These permits have not been given effect to and are not being 'renewed'.

PAST DREDGING OPERATIONS

The port has a history of both capital and maintenance dredging. Capital dredging has been undertaken at different times as new port facilities are established and also to serve larger vessels, especially log carriers. The most recent capital dredging was carried out in 2011 when approximately 32,000m3 of material was removed from the port navigation channel.

Maintenance dredging has been regularly undertaken because the adjacent Turanganui River and nearby Waipaoa River discharge large volumes of sediment into the bay. The maintenance dredging of the port has become more critical over recent years as the port navigation channel, turning basin and work berths have been deepened to provide additional depth for logging vessels. For the port to be operated efficiently, both now and in the future, regular maintenance dredging is required. The maintenance dredging has generally been carried out by a trailing suction dredge (the Pukunui).

Annual records have been kept of all maintenance dredge material. Each year they are provided to the Council and the Port Dredging Liaison Group set up as a condition of dredging consents.

The most recent 2013 Annual Report (dated 20 August 2014) notes that in the period 2003 to 2013 inclusive around 840,000m3 of maintenance dredging was carried out (i.e. on average around 76,000m3 per annum). The 2013 Annual Report notes that annual infill volumes in the Port Navigation Channel are around 80,000m3 and around 20,000m3 for the inner port.

Known sedimentation 'hot spots' include the breakwater and leeside of the breakwater, extending 300m south into the PNC. Sedimentation rates vary widely on a daily basis with incident swell wave period and tidal state. General consensus from historical reports indicates infill rates within the channel of 4,500 m3 per month (54,000m3 per year) with up to 14,300 m3 to be expected to be deposited within the channel after extreme weather events (Eastland Port Ltd 2014). This is at odds with recent dredging experience and will be investigated as part of the wider ongoing port redevelopment work, with a revised figure included in future maintenance dredging resource consents.

PROPOSED DREDGING OPERATIONS

It is expected that dredge volumes will stabilise at approximately 100,000m3 per year (the average rate since 2009). To allow for annual spikes in deposition, caused by the inter-annual variability of storm events, a maximum annual rate of 140,000m3 has been applied for by EPL. The applicant has proposed the Port Navigation Channel be dredged at a depth of 10.5 BCD dependent upon the conclusion of a Port wave study and longer term structural upgrades

EPL has applied to continue dredging through the winter unlike the current 6 month 'winter' restriction on maintenance dredging in the Wharf 4-6 area under consent CP-2013-105825. A winter restriction is stated in the application as not being practical due to

the large area of seabed that requires dredging (24.5ha within the PNC, VTB and around Wharf 7 -8 compared to the Wharves 4-6 1.5 ha). The applicant states that the dredging has to be carried out at convenient times throughout the year to account for both rough sea conditions and regular occupation of the log vessel berths, which effectively prevent dredging.

The Pukunui dredge will be towed to the Outer Spoil Disposal Ground. Once within the disposal site the hopper doors will be opened and the material disposed of. A variety of starting locations within the approximately 3km2 disposal ground will be chosen and a figure 8 track used to evenly distribute the material. Records of the disposal location, as well as the track used, will be recorded.

The disposal is expected, like the dredging, to be undertaken primarily during daylight hours, subject to the provisos noted above.

2.0 PLAN ASSESSMENT

Relevant legislation relating to the proposed activity includes the following, S12 Restrictions on use of Coastal Marine Area of the Resource Management Act 1991 (RMA 1991), the New Zealand Coastal Policy Statement (NZCPS), Chapter 6 Coastal Management of the Gisborne District Council Regional Policy Statement (RPS), Chapters 3 & 4 Activities & Management Process of the Proposed Regional Coastal Environment Plan (PRCEP).

Section 12 of the RMA determines that rules within a Regional Coastal Plan must be considered and that (in this case) resource consent is required. Appropriate rules are outlined in the Port Management Area section of the Proposed Regional Coastal Environment Plan.

The **New Zealand Coastal Policy Statement** contains objectives and policies that this application is required to have regard for. Key objectives consider maintaining and enhancing public open space and walking access, enabling communities to provide for social, economic and cultural wellbeing, accounting for the principles of the Treaty of Waitangi, recognising an efficient network of safe ports and protecting historic heritage in the coastal environment.

Policy 23 of the NZCPS relates to the Discharge of Contaminants and requires that the sensitivity of the receiving environment and the nature and concentration of contaminants is given regard to.

Chapters 3 (Water management) and 6 (Coastal management) of **the Regional Policy statement** outlines objectives, policies and methods that guide managing the use, development and protection of the region's water and coastal resources.

The RPS provides that Regional Plans shall provide more detailed methods for managing water and coastal areas.

Gisborne District Council's Proposed Regional Coastal Environment Plan. (PRCEP)

Gisborne District Council Proposed Regional Coastal Environment Plan Chapter 4 Port Management Area outlines relevant rules for the proposed maintenance dredging and spoil disposal are as follows;

Rule 4.4.9D

Maintenance dredging in the Port Management Area of the Coastal Marine Area for navigation purposes is a **controlled activity** provided the following standards and terms are met.

a) Any resource consents required for the disposal of dredge spoil have been obtained.

The Council will restrict its control to setting conditions on:

• The timing of any dredging activity.

• The exact location of any dredging if this is required to avoid any important site or value.

Principal reason: Dredging of the Port is an essential and important part of Port operations. This rule provides certainty that the activity can occur in the future but recognises that some adverse effects may be avoided, remedied or mitigated.

Council has restricted its discretion to the timing of the dredging activity and whether the dredging footprint includes an important site or value.

Rule 4.4.9G

The deposition of dredge spoils from the Port Management Area within the Port Management Area is a permitted activity provided the following standards and terms are met.

Standards and terms:

a) Deposition occurs within the Spoil Dump Outer Zone as depicted on Map 2B.1 in Appendix 2 of this Plan.

The Spoil Dump Outer Zone is defined by four corner points having the following NZMG coordinates:

Northings	**Eastings**
6264555	2942481
6265899	2943969
6263518	2944289
6264035	2944822

b) Involves quantities of less than 50, 000 cubic metres over any twelve month period; and

c) Does not result, after reasonable mixing, in the production of conspicuous oil or grease scums or floating scums or foams

Provided that:

If these standards are not met the activity is a **discretionary activity**.

Rule 4.4.7E

The discharge of stormwater runoff and uncontaminated seawater to the Coastal Marine Area is a permitted activity provided the following standards and terms are met.

Standards and terms:

In the case of stormwater runoff and discharges of uncontaminated seawater:

a) *(Pertains to stormwater so irrelevant)*

b) The discharge shall not cause the production of conspicuous oil or grease films, scums, or foams, or floatable or suspended materials in any receiving water after reasonable mixing.
c) The water classification standards for Poverty Bay set out in Chapter 3.4 and Appendix 7 are met.
Provided that:
If either a) or b) or c) are not met then the discharge of stormwater runoff or uncontaminated seawater to the CMA is a discretionary activity.

Water Quality Classification Chapter 3.4.5L:

STANDARDS FOR CLASS SA WATERS *(Relates to the Outer Spoil Disposal Ground)*
The quality of Class SA waters shall conform to the following requirements:
a) The natural water temperature shall not be changed by more than 3 degrees Celsius:
b) The natural pH of the waters shall not be changed by more than 0.1 unit and at no time shall be less than 6.7 or greater than 8.5:
c) There shall be no destruction of natural aquatic life by reason of concentration of toxic substances nor shall the waters emit objectionable odours:
d) The natural colour and clarity of the water shall not be changed to a conspicuous extent:
e) Aquatic organisms shall not be rendered unsuitable for human consumption by the presence of contaminants, and the water shall not be rendered unsuitable for bathing by the presence of contaminants.

STANDARDS FOR CLASS SB WATERS (*Applies to the Port Navigation Channel*)
The quality of Class SB waters shall conform to the following requirements:
a) The natural water temperature shall not be changed by more than 3 degrees Celsius:
b) The natural pH of the waters shall not be changed by more than 0.1 unit and at no time shall be less than 6.7 or greater than 8.5:
c) There shall be no destruction of natural aquatic life by reason of a concentration of toxic substances nor shall the waters emit objectionable odours:
d) The natural colour and clarity of the water shall not be changed to a conspicuous extent:
e) The water shall not be rendered unsuitable for bathing by the presence of contaminants

STANDARD FOR CLASS SC WATERS *(Relates to the Main Working Berths, Port Area)*
The quality of Class SC waters shall conform to the following requirements:
a) The natural water temperature shall not be changed by more than 3 degrees Celsius:
b) The natural pH of the waters shall not be changed by more than 0.1 unit and at no time shall be less than 6.7 or greater than 8.5:
c) There shall be no destruction of natural aquatic life by reason of a concentration of toxic substances nor shall the waters emit objectionable odours:
d) The natural colour and clarity of the water shall not be changed to a conspicuous extent:

Rule 4.4.11.A
Subject to all other relevant rules in chapter 4.4, any activity which generates noise located within the coastal marine area of the Port Management Area is a permitted activity provided that the following standards and terms are met.

Standards and terms:
A. The average maximum noise level (L10) and maximum noise level (Lmax) generated within the Coastal Marine Area of the Port Management Area as measured at or within the boundary of (respectively) the General Management Area, the CMA of the Port Management Area and the Protection Management Area, shall not exceed the following limits set out in Table 2.
B. Noise shall not reach a level or be of such a nature that it results in the long-term modification of the behaviour of aggregations of marine mammals or birds. Long-term, for the purpose of this standard, means any change in behaviour which is not corrected within 30 minutes and repetitive modifications to behaviour which culminate in more than 60 minutes of response to noise. Modification of behaviour includes any visible flight or flee response to noise - especially movement from a nesting or rearing site but does not include accommodation responses such as re-orientation to the source of noise; or
C. The noise is generated by any siren, bell, foghorn or any other device used for navigation and/or warning purposes.
Provided that:
If the standards and terms are not met then the activity is a discretionary activity.

Chapter 4 of the PRCEP also outlines information requirements with coastal permit application in Rule 4.7.1, 4.7.2 and 4.7.3. These requirements are summarized in Section 3.11 of the Application Document.

Summary of consents status
Overall the proposal is a **discretionary activity** under Rule 4.4.9G as up to 140,000 cubic metres of maintenance dredge material annually will be disposed in the Spoil Dump Outer Zone. The water quality classifications SA, AB and SC will be exceeded at times during dredging so Council has discretion over the discharge of decant water under Rule 4.4.7E. Further relating to rule 4.4.11A noise levels may be exceeded at times whereby a larger and noisier dredge than the Pukunui was used and taking into account the boundary is the training wall directly adjacent to where the dredging will take place. The maintenance dredging activity itself is a **controlled activity**.

3.0 RMA SECTION 91: Deferral pending application for additional consents

(1) A consent authority may determine not to proceed with the notification or hearing of an application for a resource consent if it considers on reasonable grounds that-

(a) Other resource consents under this Act will also be required in respect of the proposal to which the application relates; and

(b) It is appropriate, for the purpose of better understanding the nature of the proposal, that applications for any 1 or more of those other resource consents be made before proceeding further.

(2) Where a consent authority makes a determination under subsection (1), it shall forthwith notify the applicant of the determination.

(3) The applicant may apply to the Environment Court for an order directing that any determination under this section be revoked.

Additional consents have been applied for to authorize activities associated with the maintenance dredging. There is no deferral of this consent required for these consents to be adequately considered as the suite of consents shall be considered together.

4.0 RMA SECTION 95 Assessment

95A : Public notification of consent application at consent authority's discretion:

(1) A consent authority may, in its discretion, decide whether to publicly notify an application for a resource consent for an activity.

(2) Despite subsection (1), a consent authority must publicly notify the application if—

(a) it decides (under section 95D) that the activity will have or is likely to have adverse effects on the environment that are more than minor; or

(b) the applicant requests public notification of the application; or

(c) a rule or national environmental standard requires public notification of the application.

(3) Despite subsections (1) and (2)(a), a consent authority must not publicly notify the application if—

(a) a rule or national environmental standard precludes public notification of the application; and

(b) subsection (2)(b) does not apply.

(4) Despite subsection (3), a consent authority may publicly notify an application if it decides that special circumstances exist in relation to the application.

SECTION 95A (2) (b) Request for notification:

The applicant has not requested public notification of this application.

SECTION 95A (2)(C): Notification required by a rule:

There is no rule or NES that requires public notification.

SECTION 95A (4) Special circumstances:

Special circumstances do not exist in relation to this application. The application is associated with the renewal of an existing consent and the activity proposed is not unlike others that have been processed, particularly in other areas of New Zealand.

S95 A summary

The applicant has not requested public notification and there is no national Environmental Standard or rule that requires notification. The applicant has in fact provided evidence to support a non-notification decision. The adverse effects on the wider environment have been considered in detail in the granting of previous and similar Port maintenance dredging consents and the consent conditions approved through that process are recommended to stay in place or in such a manner that the adverse effects are mitigated to the same or an improved degree. In this case public notification is not considered by the consent authority to be appropriate. The consent authority has used its discretion to determine that public notification is not required for this proposal.

SECTION 95B: Limited notification of consent application

If a consent authority does not publicly notify an application for a resource consent for an activity, it must decide (under sections 95E to 95G) if there are any affected persons or affected order holders in relation to the activity.

The consent authority must give limited notification of the application to any affected person unless a rule or national environmental standard precludes limited notification of the application.

In this case **Limited Notification was followed**. Under section 95E the consent authority must decide if a person is an affected person. Previous consents that have been granted have acknowledged the uncertainty of effects caused by dredging and this uncertainty has been provided for by consent conditions that allow ongoing community input into the management of the dredging consents through the activities of the Port Dredging Liaison Committee. This committee adequately represents Iwi and the community and it provides an opportunity for issues that may arise during the implementation of the dredging to be discussed with the operator and for 'best practices' to be considered and if appropriate adopted by the applicant.

The Port Dredging Liaison Group has not met since February 2010. Since that time the annual report has been forwarded to members of the group and there has been no call from any member to hold a meeting to consider any issues that may have been identified during the year or as a result of considering the annual report. Despite this apparent acceptance that dredging has been carried out without any issues being identified it is considered that this forum should continue to have a key role in considering dredging proposals. This has determined that members of the Port Dredging Liaison Committee (representing a wide range of community interests and values) shall be considered affected persons.

SECTION 95D: A Consent Authority decides if adverse effects likely to be more than minor

A consent authority that is deciding, for the purpose of section 95A (2)(a), whether an activity will have or is likely to have adverse effects on the environment that are more than minor —

a) must disregard any effects on persons who own or occupy—
   (i) the land in, on, or over which the activity will occur; or
   (ii) any land adjacent to that land; and

(b) may disregard an adverse effect of the activity if a rule or national environmental standard permits an activity with that effect; and

(c) in the case of a controlled or restricted discretionary activity, must disregard an adverse effect of the activity that does not relate to a matter for which a rule or national environmental standard reserves control or restricts discretion; and

(d) must disregard trade competition and the effects of trade competition; and

(e) must disregard any effect on a person who has given written approval to the relevant application.

Section 95D has been considered and the effects that must be disregarded have been followed.

ASSESSMENT OF EFFECTS

In deciding whether the activity will have or is likely to have adverse effects on the environment the potential effects on the environment from the proposed maintenance dredging will be summarised.

Coastal Processes

Maintenance dredging operations will be very similar to those carried out in the past. Although the applicant proposes that further investigation of sediment transport processes within the PNC and related port areas be implemented, the effects of continued maintenance dredging on coastal processes in and around the port are expected to be only of a 'minor' nature.

Previous reports describe Coastal processes and it is noted that in communications from Ngai Tamanuhiri there could be benefit from further investigation of the effects from dredge spoil dispersal due to coastal processes. The applicant was unsure whether Ngai Tamanuhiri wishes to complete studies on this.

The application included a report by Worley Parsons Consultants (2 Feb 2015) and this report concluded that further study should be undertaken during the duration of this period of dredging. The further study will provide better understanding of the coastal processes and the dynamics of tide and currents effect on the dredging deposits at the outer spoil disposal area. Consent conditions have been offered by the applicant to include these studies as conditions.

Water Quality

The potential effects on water quality are assessed as follows:

- Heavy metals in the sediments may be mobilised and introduced into the water column by the maintenance dredging process. However based on recent monitoring results they should not occur at concentrations that will be directly or indirectly toxic to marine life either within or beyond the port environment. However continued monitoring, along the lines of that required under the current coastal permits is proposed to check that this situation continues;
- Additional periodic elutriate testing of the sediments from the VTB & PNC is offered by the applicant and is recommended. This monitoring is proposed in order to confirm the contaminant discharges to the coastal waters are consistent with the SC & SB water quality standard for these respective areas.
- Turbidity will be created around the decant water from the hopper barge and this will at times result in a conspicuous change in colour and clarity in the vicinity of the dredging operation. However after 'reasonable mixing', and given the intermittent nature of the dredging, this effect should not persist within the port or in the adjacent coastal waters. On this basis no turbidity monitoring is proposed, as is the current situation.
- Maintenance dredging will not be a source of potential pathogens that might influence the bathing waters in the beaches near the port. The dredging is unlikely to affect the SB bathing water classification of the PNC area and as such no water microbiological monitoring is proposed. This approach is consistent with the current consents that do not require such monitoring;

Overall, the existing SB and SC water quality classifications of the PNC and main port area will be maintained and not compromised by the proposed maintenance dredging.

The effects of maintenance dredging on water quality is no more than minor.

Juvenile Crayfish

Crayfish will be unlikely to occupy the seabed within the port but will potentially inhabit structures adjacent to and generally above the seabed. Rather it is assumed that the concern is around the potential indirect effect where increased sediment in the water column and sediment deposition from dredging might affect the crayfish larvae/juveniles and their habitat.

Settlement can occur throughout the year and density is highly variable but with seasonal peaks. Annual density has been reported to vary by several orders of magnitude. Sampling effort for juvenile crayfish indicates that crayfish are not always present in the port in high numbers.

It has been well established that Gisborne Port is an area into which larval or puerulus crayfish and juvenile crayfish (*Jasus edwardsii*) settle. Ruru reports on pueruli and juveniles captured from within the Port area in crevice collectors in May 1993. Booth et al 2002 comment that when wooden piles were removed at Port Gisborne in the mid1960s, numerous pueruli and young juveniles were found in cracks and crevices in the piles (unpubl. NIWA data). Furthermore the concrete piles that replaced the old wooden ones were driven into oversized holes and these holes, along with the growth that developed on the piles, were reported as occupied by many young crayfish

Specifically, the existing consent covering maintenance dredging for the wharf 4, 5 and 6 work berths (CP 2013 105825), requires that dredging is not to take place between April and September ('winter') inclusive without the prior written approval of the Council (Condition 4). This restriction apparently involves only a small volume of material which could be removed over a period of probably not more than a few days as discussed in section 2.5 of the applicants AEE. The restricted water area adjacent to these smaller upper berths also means that dredging is more likely to involve a backhoe hydraulic grab. This mode generates less turbidity than suction dredging due to the absence of decant water.

A recently issued capital dredging consent contains a similar consideration and requires that dredging within 50m of Berth 7 can occur subject to Council approval in the period April to September.

The April to September period has a biological basis being the period over which crayfish are most likely to move from their planktonic stage to settle in the port and coastal area in general as puerulus juveniles. The long planktonic life cycle and the vagaries of environmental influences such as currents acting over the continental shelf, preclude a more specific time period being identified. Crayfish can settle over an extended period and peaks in settlement usually occur within that period.

Surveys over a long period have confirmed that the hard structures that make up the port environs continue to experience variable but at times high settlement of juvenile crayfish.

It is agreed with the applicant that existing consent conditions restricting dredging between April and September, intended to mitigate any water quality related effect on crayfish juveniles (discussed below), may reflect a precautionary approach taken by Council in the past to limit exposure of the newly settled crayfish at a vulnerable life history stage.

Maintenance dredging in the future is proposed to remove a greater volume of material using the same or similar plant and capacity. This equates to a requirement for a greater duration of dredging and/or more days of dredging

The Tairawhiti Rock Lobster Association and the National Rock Lobster Council have provided comments to the regulator referring to the value that the crayfish industry may obtain from the high rates of puerulus settlement under the Eastland Port wharves. An approach to continue dialogue and to develop any joint approaches in regard to managing the high populations of potentially migrating juvenile rock lobster is reflected

in an advice note attached to the recommended conditions The consent conditions recommended have in effect removed restrictions on dredging due to the existence of the juvenile rock lobster settling area adjacent to the dredging locations. The Rock Lobster Industry and Iwi were notified and no submissions were received from them. The emailed information from the Rock Lobster industry Groups reinforced the importance of the settling area. My opinion is that any action that assists in the survival and resettling rates of rock lobster should be considered through the Port Liaison Committee activity and this relies on the goodwill of Eastland Port Ltd.

The limited notification process did allow for the Rock Lobster Industry and Iwi to submit on the application. With no such submissions and with a strong case being made by the applicant to remove any restrictions on dredging due to the presence of Peurulus the recommended conditions do not contain any restrictions on the timing or any buffer zone during the settlement period of May to September.

The consent authority has gone to some effort to determine the actual effect from dredging on the peurulus settlement area. This has included contacting Ministry of Primary Industries (and NIWA who contract to complete surveys), The National Rock Lobster Industry Council and the Local Rock Lobster Industry Association. These contacts have supported a view that although the settlement area may be important in the overall recruitment and survival of rock lobster, the juvenile forms appear to inhabit crevices associated with the structures rather than on the sediment floor that is to be dredged. A conclusion has been reached that the restrictions are not required and this conclusion is based partly on the following summary from the Rock Lobster Industry,

The best that you might plan for in the circumstances is that any potentially adverse effects of dredging and associated sediment clouds would be mitigated if the activity was confined to the Spring/Summer period.

The TRLI Association believes that the applicant has no data that shows the effect of dredging on peurulus larvae in the Gisborne port. This is the obvious starting point. If no larvae show up in trial dredging and the sediment cloud was not significant, we would be reassured that dredging poses little threat to the health of the fishery.

Jeff Forman of NIWA provided the following comment:

From 1987 to 2003 Dr John Booth and I (I started in 1993) have done a lot work under the wharf (Dr Booth retired in 2006). We stopped monitoring puerulus settlement under the wharf in Gisborne in 2003.
What is the extent of the dredging? When we worked there the Pukunui was always operating and at one time the channel was deepened.
The puerulus do not settle in the muddy channel. Settlement occurs during the night where the puerulus swim until they find a suitable hard surface to hide. In the case of Gisborne wharf this is mostly the rocky area under Wharves 6 and 7, so this was the most important area to us and where we had all our collectors. The main settlement months are June and July.
As to whether there is any flow on effect from the high settlement in the wharf to increased abundance to the outer areas is not certain and there is no hard evidence either way.

Jeff Forman's comments specify wharf 6 & 7 as being the key locations for the Peurulus settlement. Wharf 6 is covered by existing maintenance dredging consents and this consent is for wharves 7 & 8. Dredging does not take place at night and as the evidence for any increase in abundance to outer fishery areas is uncertain the conclusion to remove the dredging time and buffer zone restrictions is supported.

The Port Liaison committee can consider any results from Peurulus settlement data and should high numbers be observed at any time a community effort can be developed

through the Port and the Industry to consider the feasibility of catching and releasing away from the dredging area. It is considered inappropriate to restrict the Port dredging activity in this area without more detailed facts on the potential for achieving any enhanced migration of young rock lobster from the settlement sites.

Other Biota have been monitored by benthic surveys at five yearly intervals both inside the disposal area and immediately outside of the disposal area. This level of monitoring has been offered by the applicant for continuation at the previously consented frequency. Comment on the benthic surveys is below in discussion about the outer spoil disposal ground.

OUTER SPOIL DISPOSAL GROUND

The effects of disposal of maintenance dredge material at the Outer Spoil Disposal Ground as they relate to both the site, adjacent land and wider environment are summarized as follows:

- The physical characteristics of the disposal ground which include high energy, high sediment flux due to natural riverine discharges and a net transport of sediment offshore into deeper water, largely govern the type of benthic community that occurs on the site. Such communities are naturally responsive to such conditions and the disposal of dredged material will have a relatively small scale influence on the community make up and health;
- Disposal of the potentially increased volumes of dredged material, should not cause changes significantly beyond what has been documented in the NIWA benthic ecology monitoring surveys. On that basis, effects should be of a 'minor' nature and scale in terms of impacts on the ecology both within and adjacent to the disposal ground; and
- Water quality effects of the disposal activities at the disposal ground are also considered to be 'minor'. The SA water quality standard will be met, after a temporal allowance for 'reasonable mixing' in order to allow turbidity generated by the disposal to dissipate

NOISE

The maintenance dredging operations are unlikely to comply with the one of the Port Management Area noise rule conditions. However this situation relates to the port and river training wall boundary, rather than any affected property owners or occupiers and as no 'effects' basis. The actual noise effects on property owners or occupiers will be of a 'less than minor' nature. This includes the noise from possible night time (after 10pm) operations, which the report notes will comply with the wider port operating noise rule. Overall, noise effects resulting from the proposed activity on property owners or occupiers will be less than minor

AMENITY, HERITAGE AND CULTURAL VALUES

Effects on amenity and heritage values resulting from the proposed activity are assessed as less than minor. Heritage NZ has commented about a shipwreck and the applicant has investigated and reported on the location as being well away from any effect likely from dredging or disposal. As Heritage NZ have not provided written approval of the proposal they had an opportunity to further consider heritage values and by following-up with a submission if considered that this assessment should be challenged.

Cultural values have been considered through previous applications and associated hearing and appeals. This report does not offer an opinion on cultural values as the Iwi groups that have been consulted with have proposed a consultation process that may be able to make use of current 'best practice' in assessing cultural values. Rather than

propose that the cultural effects are less than minor or that they have been adequately addressed through previous consenting processes the limited notification process allowed submissions to be offered and none were received.

SECTION 95E: Consent authority decides if person is affected person

(1) A consent authority must decide that a person is an affected person, in relation to an activity, if the activity's adverse effects on the person are minor or more than minor (but are not less than minor).

(2) The consent authority, in making its decision,—

(a) may disregard an adverse effect of the activity on the person if a rule or national environmental standard permits an activity with that effect; and

(b) in the case of a controlled or restricted discretionary activity, must disregard an adverse effect of the activity on the person that does not relate to a matter for which a rule or national environmental standard reserves control or restricts discretion; and

(c) must have regard to every relevant statutory acknowledgement made in accordance with an Act specified in Schedule 11.

(3) Despite anything else in this section, the consent authority must decide that a person is not an affected person if—

(a) the person has given written approval to the activity and has not withdrawn the approval in a written notice received by the authority before the authority has decided whether there are any affected persons; or

(b) it is unreasonable in the circumstances to seek the person's written approval.

AFFECTED PERSONS: SECTION 95E

Are there any affected persons?

Yes

Have all of these persons given written approval to the proposal?

No

There are no affected parties that have provided written approval to the application although communication from DoC, Heritage NZ and Maritime NZ could be considered in this regard. From the correspondence provided by the applicant it can be established that Maritime NZ has provided written approval and although Heritage NZ has provided comments in regard to heritage locations they should be considered an affected party as no definite approval from Heritage NZ is noted. Department of Conservation is not considered an affected party as such but is a member of the Port Dredging Liaison Committee and should be notified as a member of the liaison committee.

Rock lobster Fishery industry groups were considered an affected party. This is due to the presence of puerulus and juvenile rock lobster settlements on and near structures in the wharf berthing areas.

Affected Parties notified:

Te Runanga o te Turanganui a Kiwa
Ngai Tamanuhiri
Ngati Oneone
Tairawhiti Rock Lobster Industry Association

Port Liaison Group Recreation water users
Department of Conservation
Heritage NZ Pouhere Taonga

By the date that submissions were required to have been received by Council (June 9th 2015) no submissions had been received. As a consequence no hearing is required and a decision has been made by delegated authority.

Summary of Effects:

The maintenance dredging, discharge of decant water and disposal of maintenance dredge spoil does not comply with the Permitted Activity rules for the Proposed Coastal Environment Plan. Therefore, consideration must be given to the adverse effects that will be caused on the surrounding environment. This includes matters that may have value to the community such as the potential effects on juvenile crayfish and on recreational users of the water in Poverty Bay.

Cultural values have not been assessed in this report as a limited notification process that includes Iwi groups both as a member of the Port dredging Liaison group and in their own right was considered appropriate.

It is not considered that there are adverse effects beyond those who have been identified as affected parties under section 95E. Therefore, the consent application does not need to be assessed under section 95A for publicly notified resource consents. The applicant has obtained approvals from Maritime NZ, but other identified parties that may be affected have not provided their approval. Therefore, the effects, on those parties are considered to be less than minor and the application was processed under section 95B as a Limited Notified resource consent.

5.0 DECISION

Pursuant to Sections 104 and 104B of the Resource Management Act 1991, I hereby grant consent to Eastland Port Limited for maintenance dredging of the port navigation channel, vessel turning basin and Wharves 7 and 8 area at the Port of Gisborne, legally described as Lot 7 DP 7819, for a period of 5 years, subject to the following conditions and advice notes:

General Conditions (Applying to both maintenance dredging and disposal of dredgings)

1. Activities to be in Accordance with the Applications

The maintenance dredging and disposal activities shall be carried out in accordance with the submitted application dated January 2015, responses to request for further information (letters dated March 31st 2015 and April 24th 2015) and accompanying plans and maps, except to the extent that these are required to be modified to comply with the conditions of this permit.

2. Payment of Council Charges

The consent holder shall pay to the Gisborne District Council (the Council hereafter) any administration, inspection or monitoring charges fixed in accordance with Section 36 (1) of the

Resource Management Act 1991, or any additional charge pursuant to Section 36 of the Resource Management Act 1991, payable in respect of these consents.

3. Annual Maintenance Dredging & Disposal Report

The consent holder shall submit to the Council and the Port Community Liaison Group before the 30th of June each year a report on the years maintenance dredging and disposal operations, including the approximate quantities of dredged material, the principal areas of dredging (i.e. the port navigation channel, vessel turning basin, and wharves), along with the results of the sediment and water quality monitoring required under the specific conditions of these consents.

4. Review of Consent Conditions by Council

(a) The Shared Services Manager of the Council may give notice to the consent holder of the intention to review the conditions of these consents, pursuant to Sections 128 and 129 of the Resource Management Act 1991.

(b) The review shall occur within one month following the 30 June of each year for all or any of the following purposes:

(i) To require the consent holder to adopt the best practicable option to remove or reduce any adverse effects on the environment; or
(ii) To deal with any adverse effects on the environment on which the exercise of these consents may have an influence; or
(iii) To consider the need to apply any specific effects monitoring regime which may be required from time to time;
(iv) To consider the need vary the areas over which the consents apply; or
(v) To apply restrictions on the maintenance dredging or disposal operations in terms of rates, quantities or times.

5. Port Community Liaison Group

(a) The consent holder shall establish and maintain a Port Community Liaison Group (Liaison Group hereafter) so as to provide an on-going point of contact between the consent holder, the community and the Council, as a forum for discussing any issues that arise from the exercise of consents and to ensure that the channels of communication are kept open.

(b) The consent holder shall invite the following parties with interests in the maintenance dredging and disposal operations and other port activities to be members of the Liaison Group:

(i) The Council
(ii) Ngati Oneone
(iii) Ngati Tamanuhiri
(iv) Te Runanga o Turanganui a Kiwa
(v) Department of Conservation
(vi) Tairawhiti Rock Lobster Industry Association
(vii) Gisborne Kayak Club
(viii) Midway and Waikanae Surf Club (1 representative)

(c) The Liaison Group functions include, but are not limited to, the following:

(i) Receiving and reviewing reports from the consent holder, including those on monitoring, required under the consent conditions;

(ii) Providing advice to the consent holder and Council on any cultural, environmental or recreational use issues of concern to the community arising from the maintenance dredging and disposal operations;
(iii) Providing advice to the consent holder and Council on any applications by the consent holder to change the consent conditions or any review of consent conditions initiated by the Council;
(iv) Developing with the consent holder and Council informal protocols and practices to address any issues of concern to the community that may compliment the consent conditions.

(d) The consent holder shall convene the first meeting of the Liaison Group within four weeks of the commencement of the consents. The consent holder shall be responsible for convening all subsequent meetings of the Liaison Group, generally at 6 monthly intervals.

(e) The consent holder shall provide the Council with minutes of all meetings of the Liaison Group.

Advice notes.

- Provision of advice from the Community Liaison Group may include advice regarding the provision of catching juvenile rock lobster for release beyond the dredging area. Protocols may be developed to allow this to occur.
- The consent holder has agreed to have a holding space on the Company website. This space will hold all relevant reports, technical material, monitoring results and interpretation.

Conditions Specific to Maintenance Dredging

6. Area of Maintenance Dredging

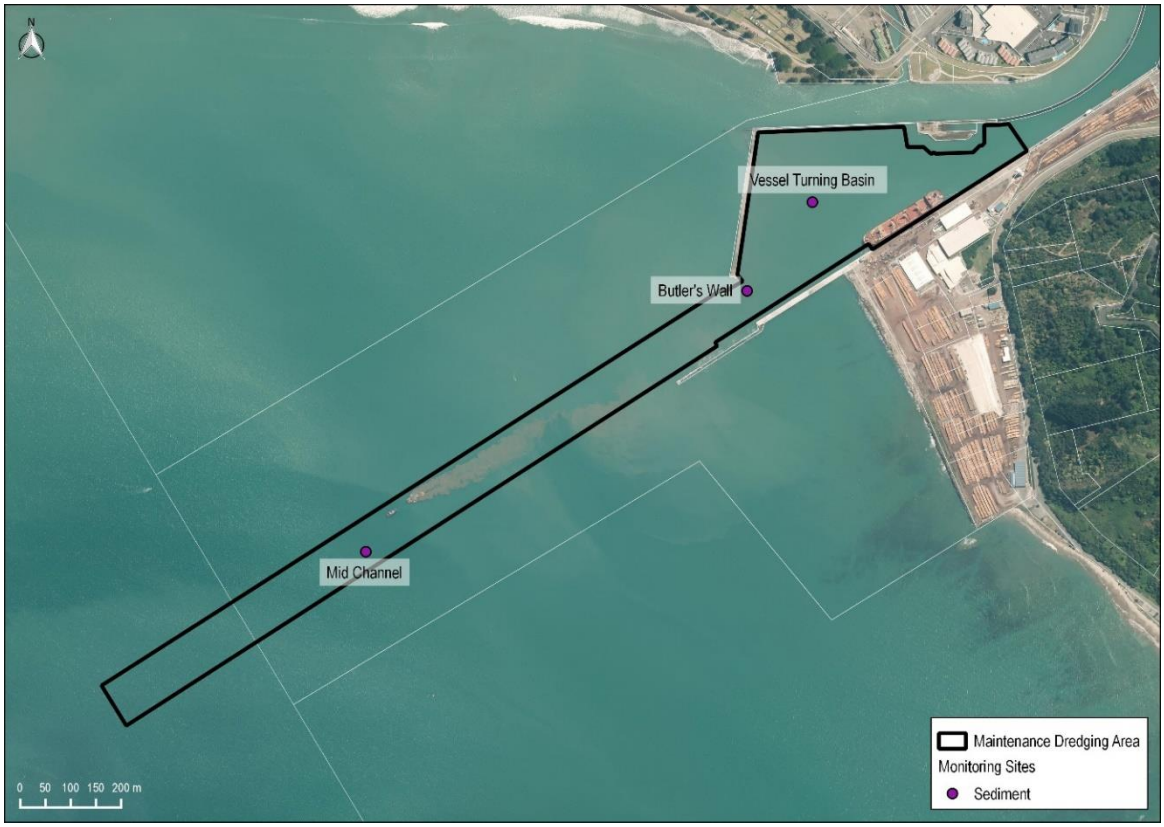
The maintenance dredging authorised by this consent is limited to the port operating area, including the port navigation channel, vessel turning basin and wharf berth pockets, shown on the attached Plan A.

7. Management of Operations to Limit Effects on Water Colour & Visual Clarity

There shall be no conspicuous change in the colour and visual clarity of the seawater as a result of the consent holders operations and activities that are authorised by this consent after two hours of the cessation of each dredge run.

8. Sediment Quality Monitoring Programme

(a) The consent holder shall, annually in February or March, arrange representative sampling and analysis of metals and a metalloid (arsenic) within the sediments to be maintenance dredged. The sampling shall be related to the exposed port navigation channel and the more sheltered vessel turning basin and wharf berth pocket area generally involve the three sites shown in Plan A. A Standard Operating Procedure for the sampling and analysis is to be provided to the Council before provided the work is undertaken.



Plan A: Maintenance Dredging Area & Sediment Sampling Sites

(b) The sediment sampling and analysis shall be for the metals and metalloid (arsenic) identified below. The results shall be carried with reference to the ANZECC Guidelines for Marine Water Quality 2000 Table 3.5.1 Recommended Interim Sediment Quality Guidelines – Low Trigger Value also listed below in order to assess the suitability of the dredged sediments for offshore disposal.

Parameter	**ANZECC Marine Water Quality Guidelines ISQG-Low Trigger Value (mg/kg)**
Arsenic	20
Cadmium	1.5
Chromium	80
Copper	65
Lead	50
Mercury	0.15
Nickel	21
Silver	1
Zinc	200

(c) All sampling and analysis shall be carried out by suitably qualified independent contractors and analytical laboratories approved by the consent authority and such sampling and analysis shall be carried out at the cost of the consent holder. The analysis shall be carried out in accordance with the American Public Health Association, American Water Works Association and Water Pollution Control Federation: Standard Methods for Examination of Water & Wastewater: 22nd (2012) or newer edition.

(d) A report presenting and interpreting the results of each sediment metals and metalloids monitoring survey with reference to the ANZECC trigger value guidelines shall be prepared by an independent contractor(s), and a copy forwarded to the consent holder, the Council and Port Community Liaison Group within 20 working days of completion of the laboratory analysis.

(e) Where an ANZECC trigger value guideline is exceeded in a particular survey, further sampling shall be undertaken to verify the exceedance and background concentrations in nearby parts of Poverty Bay that are beyond the port. If background levels in nearby parts of Poverty Bay are also above the trigger value guideline then no further action is required. If the background levels are below the trigger value guideline limit, then the monitoring report provided to the Council shall identify the possible sources of the contaminant and if one or more of the sources can be related to port related activities then the report shall identify any possible management options for the reducing the levels of contaminant discharge to the port.

(f) Where an ANZECC trigger value guideline is exceeded in two or more surveys and for which background levels do not also exceed the guideline sediment limit, then a sediment quality survey shall be undertaken to representatively determine metal concentrations in the sediments at the Offshore Spoil Disposal Ground (OSDG hereafter). The results of the OSDG survey shall be reported to the Council within 20 working days of completion of the laboratory analysis. The report shall assess the significance of the results in relation to the continued use of the OSDG, along with any recommended measures to avoid remedy or mitigate any adverse effects that are assessed to be of a more than minor nature.

Advice Notes

The ISQG - Low guideline values are those below which toxicological effects on biota are unlikely, and above which such effects are more probable. They are not 'compliance limits' that have to be met on all occasions as outlined in clauses (e) and (f).

The Council has under Condition 4 the ability to review the consent conditions in response to any matter that arises from the reporting procedures in Condition 9 Clauses (e) and (f).

9. Water Quality Monitoring Programme

(a) The consent holder shall once every three years, in February or March, as part of the sediment sampling in the vessel turning basin and wharf berth pocket areas, arrange for an elutriate test of metals to be carried out by a registered analytical laboratory. A Standard Operating Procedure for the testing is to be provided to the Council before the work is undertaken.

(b) The elutriate testing will require the metals identified below to be measured in the following samples:

(i) sediment used in the elutriate test;

(ii) seawater used in the elutriate test; and
(iii) filtered elutriate generated by the elutriate test.

(c) The metal concentrations tested in the seawater and the elutriate shall be compared with the ANZECC 2000 Guidelines for Marine Water Table 3.4.1 Trigger Values for Toxicants at the 95% Species Protection Level set out below.

Parameter	**ANZECC Marine Water Guidelines Trigger values for 95% species protection level (ug/l)**
Cadmium	5.5
Chromium (CR111)	27.4
Chromium (CR VI)	4.4
Copper	1.3
Lead	4.4
Mercury (inorganic)	0.4
Nickel	70
Silver	1.4
Zinc	15

(d) If the elutriate testing indicates that after reasonable mixing and dilution, concentrations of one or more of the tested metals exceed the above mentioned ANZECC 2000 trigger values then additional water quality testing and analysis for the same parameters shall be undertaken in order to establish background concentrations of the metals, the gradient of metal concentrations near the working dredge and possible influencing factors.

(e) The results of the further water quality testing and analysis shall be reported to the Council within 20 working days of completion of the laboratory analysis. The monitoring report provided to the Council shall identify the possible sources of the contaminant and if one or more of the sources can be related to port related activities then the report shall identify any possible management options for the reducing the levels of contaminant discharge to the port.

10. Dredging of areas from which samples exceeding heavy metal limits have been taken is only to be undertaken following consent authority written approval after a review of results of any investigation or reports commissioned pursuant to conditions 8 and 9 and, remedial measures, or alternative selective removal and disposal proposals contained therein.

11. Review of Sediment and Water Quality Monitoring Programme

The consent holder may as part of the any sediment or water quality monitoring report submitted to the Council request changes to the frequency of the testing, analysis and reporting to the Council where the concentrations of metalloids/metals have over a significant period of time been consistently below the ANZECC guideline trigger values.

Advice Note

This condition is simply intended to enable the consent holder to not test for certain parameters where they are consistently below the ANZECC trigger value guidelines. They are not intended to give the consent holder the ability to alter the nature of the testing nor the ANZECC trigger values, which can only be changed through an application under Section 127 of the RMA.

12. Limits on Noise Emissions

(a) The longer term average sound level (Ldn) from "essential port activities" within the Port Management zones shall not exceed 55dBA at any point outside the 55dBA noise contour nor 65dBA at any point outside the 65dBA noise contour.

(b) The noise emitted by maintenance dredging activities occurring between 10pm and

7am the following day shall comply with the following limits;

(i) The average sound level (L_{eq}) shall not exceed 60dBA when measured at any point beyond the 65dBA noise contour depicted within Appendix 28 of the Operative Gisborne Combined Regional Land & District Plan; and

(ii) The night time maximum sound level (L_{max}) shall not exceed 85dBA at any point beyond the 65dBA noise contour depicted within Appendix 28 of the Operative Gisborne Combined Regional Land & District Plan.

(c) The measurement and assessment of noise emissions shall be in accordance with NZS 6809:1999 Acoustics - Port Noise Management and Land Use Planning.

Conditions Specific to Disposal of Dredgings

13. Area of Dredgings Disposal

All dredged material shall be disposed of within the Offshore Spoil Disposal Ground (OSDG) identified by the following NZTM co-ordinates and shown in Plan B.

Northings	Eastings
5703102	2032605
5704450	2034095
5702065	2034417
5702583	2034951

Plan B – Offshore Spoil Disposal Ground

14. Spread of Dredged Material

The dredged material shall be evenly discharged so as to spread over the Offshore Spoil Disposal Ground and not concentrated in any one particular location. Each dredge discharge track is to be logged and a copy of the log forwarded to the Council annually by the 31st of October in the year in which the disposal occurs until this consent expires.

15. Management of Operations to Limit Effects on Water Colour and Visual Clarity

There shall be no conspicuous visual change in colour and visual clarity of the seawater as a result of the consent holders operations and activities that are authorised by this consent after six hours of the cessation of each dredge discharge run.

16. Disposal Ground Surveys and Monitoring

The consent holder shall undertake annual hydrographic and side-scan sonar surveys of the Offshore Spoil Disposal Ground. The results of the surveys are to be sent to the Council and Liaison Group by the 31st of October of each year in which the survey has occurred until this consent expires.

17. Benthic Ecology Monitoring Programme

(a) The consent holder shall every five years undertake in-faunal sampling and analysis of the sediments within and near the Offshore Spoil Disposal Ground, until expiry of this consent.

(b) The sampling sites, methodology and data analysis shall be generally consistent with the last previous programme undertaken and reported on by the National Institute of Atmospheric Research (NIWA) in May 2014.

(c) The results of the sampling and analysis are to be reported to the Council and Liaison Group by the 31st October of the year sampling occurs.

18. Disposal Ground Investigations

(a) The consent holder shall within 6 months of the commencement of this consent submit to the Council and Liaison Group a report from a coastal processes engineer detailing the investigations to be carried out into the long term capacity of the Outer Spoil Disposal Ground, as generally outlined in the Worley Parsons report of 2 February 2015 submitted with the application.

(b) The consent holder shall within 1 year of the commencement of this consent and at subsequent 1 year intervals submit to the Council and Liaison Group a progress report from a coastal processes engineer on the Offshore Spoil Disposal Ground (OSDG) coastal processes investigations, along with any preliminary findings and recommendations.

(c) The consent holder shall not less than 6 months before the expiry of this consent submit to the Council and Liaison Group a report on the findings of the OSDG coastal processes investigations, along with recommendations on the future use of the facility and/or any possible alternative facilities for the disposal of maintenance dredgings from the Port of Gisborne.

The report shall:

- Determine settling velocity of dredge spoil sediments and relate this to plume longevity caused by the activities authorised by these consents.
- Determine and complete a programme of targeted data collection for spring and neap tide situations during dredging to characterise settling and dispersion patterns of sediment from dredging.
- Determine and complete a programme using Acoustic Doppler Current Profiler (ADCP) to characterise currents through the water column to inform settling rates and dispersal patterns caused by the activities authorised by these consents.
- Determine the long term capacity of the outer spoil disposal ground for the disposal of spoil from Eastland Port dredging.

Reasons for Decision

1. Provided the proposed activities are undertaken in the manner proposed and in compliance with the recommended consent conditions the effects of this consent is unlikely to cause adverse effects on the environment.
2. The granting of this consent is consistent with the Regional Policy Statement, Regional Plans and the sustainable management of natural and physical resources. The proposal is therefore in keeping with the purpose and principal of Part A of the Resource Management Act 1991.

Prepared by:

Dennis Crone
Team Leader Water Conservation

Approved under delegated authority by:

Lois Easton
Shared Services Manager

Date: _____/_____/2015 Date: _____/_____/2015

Appendix B:

SOP - Marine Sediment Sampling

SOP Number **8.0**

SOP Title **Marine Sediment Sampling**

	NAME	TITLE	SIGNATURE	DATE
Author	Christine Oakey	Environmental Management Consultant		01/03/2017
Reviewer and approved for release by	Mark Poynter	Principal Ecologist		01/03/2017

Effective Date:	01/03/2017

READ BY			
NAME	TITLE	SIGNATURE	DATE

1.0 Purpose and Scope

This Standard Operating Procedure (SOP) is for the collection of marine sediment samples from a boat.

As guidance for specific activities, this procedure does not obviate the need for professional judgment. Deviations from this procedure while planning or executing planned activities must be approved in accordance with Program requirements for technical planning and review.

This SOP sets a consistent protocol to ensure the quality of data collection—resulting in improved uniformity, reproducibility, verifiability, and defensibility of the data.

2.0 Safety Requirements

When sampling, the person performing the sampling should be wearing a lifejacket and adequate protective equipment and following appropriate boating safety procedures (See: Code of Practice for Safe Use of Small Boats).

A detailed health and safety plan is required for all sampling works. Staff training is required to help assure that sampling is conducted in a safe manner. Hazards, such as strong currents, can lead to severe injury or death, so special precautions are required.

3.0 Qualifications and Training:

3.1 Training and Qualifications

The individual executing these procedures must have read, and be familiar with, the requirements of this SOP and the Code of Practice for Safe Use of Small Boats.

3.2 Responsibilities:

- The Infrastructure Manager is responsible for ensuring that sampling activities comply with this procedure. The Infrastructure Manager is responsible for ensuring that all field-sampling personnel involved shall have the appropriate education, experience, and training to perform their assigned tasks.
- The Infrastructure Manager is responsible for ensuring overall compliance with this procedure.
- The Operations Manager is responsible for ensuring that all field sampling personnel follow these procedures.
- Field sampling personnel are responsible for the implementation of this procedure.

4.0 Guidelines and Procedure

4.1 Method Summary

Sampling situations vary widely, and, therefore, no universal sampling procedure can be recommended.

However, sampling of marine sediment is generally accomplished using a stainless steel biological box dredge. This sampling technique will allow for the collection of representative samples.

4.2 Preparation

1) Determine the extent of the sampling effort, the sampling methods to be employed, and which equipment and supplies are needed.
2) Obtain necessary sampling and monitoring equipment.
3) Decontaminate or pre-clean equipment, and ensure that it is in working order.
4) Prepare scheduling and coordinate with staff, clients, and regulatory agency, if appropriate.
5) Perform a general site survey prior to site entry in accordance with the site-specific health and safety plan.
6) If necessary, use anchored buoys to identify and mark sampling locations.
7) GPS fix the positions of sampling sites if required.
8) Preferably, clearly pre-label sample bottles unless this can be done with dry hands on site.
9) Arrange sample containers in the order in which they will be collected.

4.3 Sample Container Composition

Sample containers should be provided by the laboratory and be particular to the analyte(s) to be measured (they may be glass, plastic or Teflon).

4.4 Box dredge sampling

A stainless steel biological box dredge is used to collect sediment samples from the seabed. Sampling procedures are as follows:

1) Ensure that the sample containers are pre-labelled.
2) Tie the box dredge to the boat using rope and chain at least 3 times the depth of water, ensure it is securely fastened.
3) Drop the box dredge into the water until it reaches the seabed.
4) Tow the box dredge behind the boat in the area required to be sampled until the box dredge is full of sediment.

5) Pull up the box dredge.

6) Take photos of the box dredge, take field notes, including the appearance of the sediment and any presence of marine animals.

7) Remove the sample container lid(s) and using a decontaminated trowel subsample the bulk sample and place sediment into the container(s).

8) Replace the container lid(s).

9) Discard any remaining sediment collected back into the sea.

4.5 Sample Preservation, Containers, Handling and Storage

Once samples have been collected, follow these procedures:

- Cap the container, put it in a Ziploc plastic bag and place in a chilly bin, cooled as appropriate.
- Record all pertinent data in the site logbook or on a field data sheet.
- Rinse/Decontaminate all sampling equipment prior to the collection of further samples. Thoroughly rinse the box dredge and trowel with the local seawater (scrub if necessary). Rinse trowel with deionised water.
- On land, complete the chain of custody form.

See SOPs for Equipment Decontamination and for Sample handling, storage, shipping, recordkeeping and chain of custody.

4.6 Interferences and Potential Problems

There are two primary interferences or potential problems with marine sediment sampling. These include cross-contamination of samples and improper sample collection.

Cross-contamination problems can be eliminated or minimised through the use of dedicated sampling equipment. Always collect samples from low-contaminant to high-contaminant concentration areas and decontaminate/rinse equipment between samples.

Following proper decontamination procedures will eliminate these problems.

5.0 Quality Control and Assurance

Manufacturer's instructions, if any, for maintaining the box bredge shall be followed.

6.0 Procedures, standards and references

SOP 1: Sample handling, storage, shipping, recordkeeping and chain of custody

SOP 6: Equipment Decontamination.

7.0 Equipment requirements

Equipment needed for collection of water samples includes:

- Stainless steel biological box dredge
- Rope
- Labelled Sample collection bottles
- Self-sealing plastic bags
- Pre frozen chilli paks as appropriate
- Chilly bin(s)
- Chain of custody forms, field data sheets
- Decontamination equipment
- Maps/plot plan
- Safety equipment
- Camera
- Logbook/forms and waterproof pen

Appendix C:

SOP - Elutriate Testing

SOP Number **9.0**

SOP Title **ELUTRIATE TESTING**

	NAME	TITLE	SIGNATURE	DATE
Author	Christine Oakey	Environmental Management Consultant		01/03/2017
Reviewer and approved for release by	Mark Poynter	Principal Ecologist		01/03/2017

Effective Date:	01/03/2017

READ BY			
NAME	TITLE	SIGNATURE	DATE

1.0 Purpose and Scope

This Standard Operating Procedure (SOP) is for the collection of marine samples for Elutriate testing. An elutriate test is used to investigate what happens when sediments are removed from the seabed and exposed to aerated seawater. The test involves agitation of the sampled sediments under controlled laboratory conditions then filtering and testing of residual liquid for target contaminants.

As guidance for specific activities, this procedure does not obviate the need for professional judgment. Deviations from this procedure while planning or executing planned activities must be approved in accordance with Program requirements for technical planning and review.

This SOP sets a consistent protocol to ensure the quality of data collection—resulting in improved uniformity, reproducibility, verifiability, and defensibility of the data.

2.0 Safety Requirements

When sampling, the person performing the sampling should be wearing a lifejacket and adequate protective equipment and following appropriate boating safety procedures (See: Code of Practice for Safe Use of Small Boats).

A detailed health and safety plan is required for all sampling works. Staff training is required to help assure that sampling is conducted in a safe manner. Hazards, such as strong currents, can lead to severe injury or death, so special precautions are required.

3.0 Qualifications and Training:

3.1 Training and Qualifications

The individual executing these procedures must have read, and be familiar with, the requirements of this SOP and the Code of Practice for Safe Use of Small Boats.

3.2 Responsibilities:

- The Infrastructure Manager is responsible for ensuring that sampling activities comply with this procedure. The Infrastructure Manager is responsible for ensuring that all field-sampling personnel involved shall have the appropriate education, experience, and training to perform their assigned tasks.
- The Infrastructure Manager is responsible for ensuring overall compliance with this procedure.
- The Operations Manager is responsible for ensuring that all field sampling personnel follow these procedures.
- Field sampling personnel are responsible for the implementation of this procedure.

4.0 Guidelines and Procedure

4.1 Method Summary

Sampling situations vary widely, and, therefore, no universal sampling procedure can be recommended.

Sampling of marine sediment is generally accomplished using a stainless steel biological box dredge.

Sampling of marine water for the elutriation fluid is generally accomplished through the use of one of the following samplers or techniques:

- Dip/Mighty Gripper Sampler
- Direct Method
- Van Dorn Sampler

The marine water sampling shall be undertaken at the same time as the sediment sampling.

These sampling techniques will allow for the collection of representative samples from the surface waters and/or at selected depths as determined by the consultant in liaison with the nalytical laboratory.

4.2 Preparation

1) Determine the extent of the sampling effort, the sampling methods to be employed, and which equipment and supplies are needed.
2) Obtain necessary sampling and monitoring equipment.
3) Decontaminate or pre-clean equipment, and ensure that it is in working order.
4) Prepare scheduling and coordinate with staff, clients, and regulatory agency, if appropriate.
5) Perform a general site survey prior to site entry in accordance with the site-specific health and safety plan.
6) If necessary, use anchored buoys to identify and mark sampling locations.
7) GPS fix the positions of sampling sites if required.
8) Preferably, clearly pre-label sample bottles unless this can be done with dry hands on site.
9) Arrange sample containers in the order in which they will be collected.

4.3 Sampling Considerations

If surface water samples are required, direct dipping of the sample container into the water is desirable. Ensure the sample is collected ‘up current’ or away from any water which may have been influenced by the boat motor exhaust.

Ensure that there is no potential for contamination from contact between the sampler and the sample arising from sunscreens, contact with boat surfaces etc and used gloved 'clean hands/dirty hands' techniques if warranted.

4.4 Sample Container Composition

Sample containers should be provided by the laboratory and be particular to the analyte(s) to be measured (they may be glass, plastic or Teflon). For example, devices which are free of metal surfaces should be used for collecting samples for metal analyses.

4.5 Box dredge sampling

A stainless steel biological box dredge is used to collect sediment samples from the seabed. Sampling procedures are as follows:

1) Ensure that the sample containers are pre-labelled.
2) Tie the box dredge to the boat using rope and chain at least 3 times the depth of water, ensure it is securely fastened.
3) Drop the box dredge into the water until it reaches the seabed.
4) Tow the box dredge behind the boat in the area required to be sampled until the box dredge is full of sediment.
5) Pull up the box dredge.
6) Take photos of the box dredge, take field notes, including the appearance of the sediment and any presence of marine animals.
7) Remove the sample container lid(s) and using a decontaminated trowel place sediment into the container(s).
8) Replace the container lid(s).
9) Discard any remaining sediment collected back into the sea.

4.6 Dip/Mighty Gripper Sampler

A dip sampler is useful for situations where a sample is to be recovered from a high sided boat, or for Health or Safety, or reasons of practicality should not be collected by hand. The long handle on such a device allows access from a discrete location. Sampling procedures are as follows:

1) Ensure that the sample container is pre labelled.
2) Assemble the device and ensure the sample container is securely affixed in the bottle grip-end.
3) Remove the sample container lid.
4) Extend the device to the sample location and collect the sample being mindful of potential contamination sources at the water surface, or, collect the sample in a separate container, pre

rinsed in the waters to be sampled, and then decant into the container supplied by the laboratory.

5) Retrieve the sampler and replace the container lid, or transfer the sample to the appropriate sample container as appropriate.

4.7 Direct Method

The direct method may be utilised to collect water samples from the surface. This method is not to be used for sampling where contact with contaminants are a concern, unless appropriate gloveware and applicable Health and Safety precautions are used.

Preferably, submerse the closed sample container, open the bottle/remove the cap, collect the sample and then cap the bottle while sub-surface. The collection bottle may be rinsed two times by the water body to be sampled at the sampling location. Avoiding entrain surface debris and the boat exhaust water into the sampling zone.

When using the direct method, do not use pre-preserved sample bottles as the collection method. This may dilute the concentration of preservative necessary for proper sample preservation. Collect in a separate clean container as described above and decant into the container containing the fixative.

4.8 Van Dorn Sampler

Van Dorn Samplers (Figure 1) are intended for shallow or deep waters. Van Dorn water sample collections should be taken before any sampling procedure or activity that may disturb bottom sediments to avoid increasing turbidity at the location, such as the collection of the marine sediment using the box dredge. When discrete samples are desired from a specific depth a Van Dorn sampler will be used according to the following instructions.

- Open the Van Dorn water sampler by pulling the elastic bands and lids back and secure the hooks.
- Make sure the mechanism is locked so that it will be released by the releasers weight.
- Make sure the drain valve is closed.
- Attach the free end of the messenger line to the boat.
- Rinse the open sampler by immersing it in the water column.
- Lower the sampler to the desired depth. Avoid bottom disturbance.
- When the Van Dorn sampler is at the required depth, send down the messenger, closing the sampling device.
- Retrieve the sampler and set on a clean flat surface in a horizontal position.
- Discharge the first 10-20 ml to clear any potential contamination on the valve.
- Transfer the sample to the appropriate sample container. The amount of water flowing through the tubing can be adjusted by adjusting the air valve.

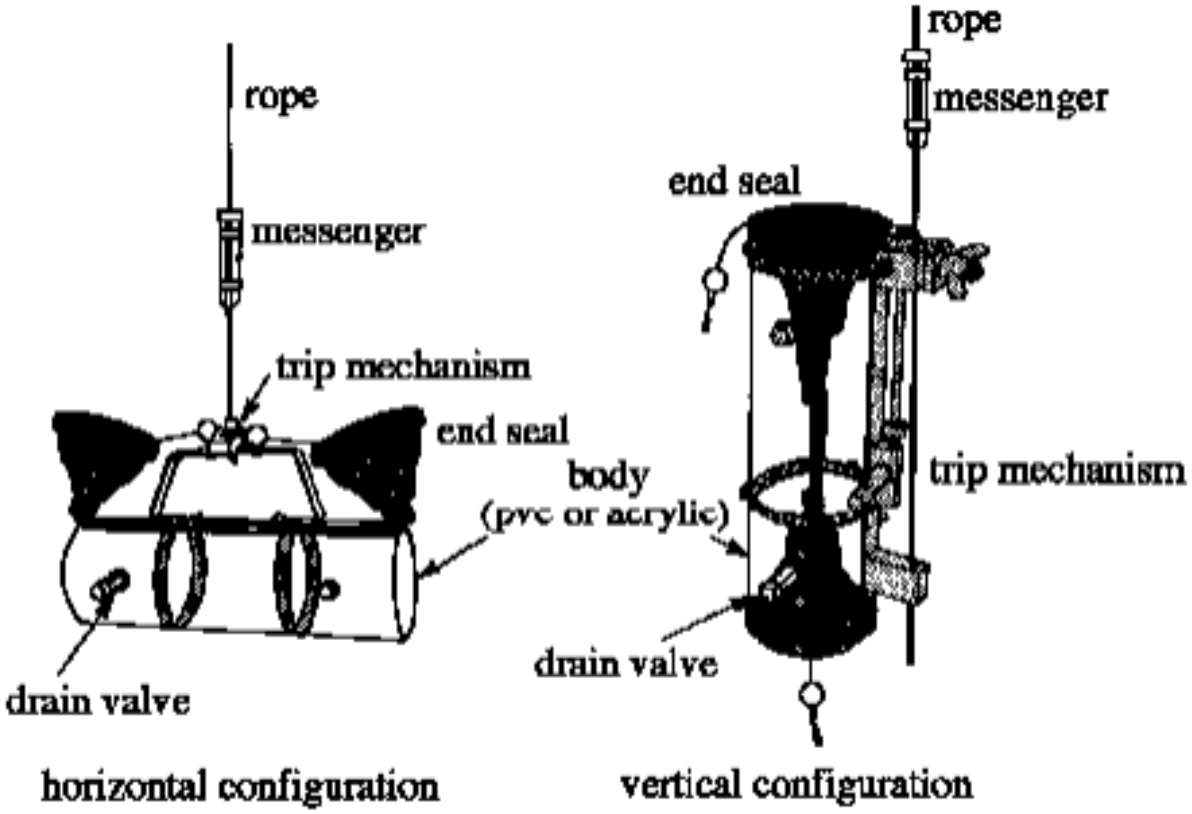


Figure 1: Van Dorn Sampler (Horizontal and Vertical Sampler)

4.9 Sample Preservation, Containers, Handling and Storage

Once samples have been collected, follow these procedures:

- Transfer the sample(s) into suitable labelled sample containers.
- Preserve the sample if appropriate, or use pre-preserved sample bottles.
- Cap the container, put it in a Ziploc plastic bag and place a chilly bin, cooled as appropriate.
- Record all pertinent data in the site logbook or on a field data sheet.
- Rinse/Decontaminate all sampling equipment prior to the collection of further samples.
- On land, complete the chain of custody form.

See SOPs for Equipment Decontamination and for Sample handling, storage, shipping, recordkeeping and chain of custody.

4.10 Interferences and Potential Problems

There are two primary interferences or potential problems with marine sediment and water sampling. These include cross-contamination of samples and improper sample collection.

Cross-contamination problems can be eliminated or minimised through the use of dedicated sampling equipment. Always collect samples from low-contaminant to high-contaminant concentration areas and decontaminate/rinse equipment between samples.

Following proper decontamination procedures will eliminate these problems.

4.11 Elutriate testing

The sediment samples and the elutriate fluid are sent to a registered analytical laboratory for elutriate testing to be performed.

5.0 Quality Control and Assurance

Manufacturer's instructions, if any, for calibrating or maintaining the accuracy of the instrument shall be followed.

6.0 Procedures, standards and references

SOP 1: Sample handling, storage, shipping, recordkeeping and chain of custody

SOP 6: Equipment Decontamination.

7.0 Equipment requirements

Equipment needed for collection of water samples includes:

- Stainless steel biological box dredge
- Dip/Mighty Dipper Sampler
- Water Quality Meter
- Van Dorn Sampler, graduated line and messenger weight assembled
- Labelled Sample collection bottles
- Self-sealing plastic bags
- Pre frozen chilli paks as appropriate
- Chilly bin(s)
- Chain of custody forms, field data sheets
- Decontamination equipment
- Maps/plot plan
- Safety equipment
- Camera

- Logbook/forms and waterproof pen

Appendix D:

Chain of Custody Form

Hill Laboratories
TRIED, TESTED **AND TRUSTED**

ANALYSIS REQUEST

R J Hill Laboratories Limited
1 Clyde Street Hamilton 3216
Private Bag 3205
Hamilton 3240 New Zealand
T 0508 HILL LAB (44 555
T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Job No: **173 7090**
Date Recv: 09-Mar-17 05:36
Received by: Kris Workman
3117370908

Quote No 83545

Primary Contact Pamela Kane-Sanderson 221602

Submitted By Pamela Kane-Sanderson 221602

Client Name 4SIGHT Consulting Limited 219138

Address PO Box 402053, Tutukaka 0153

Phone *Mobile*

Email

Charge To 4SIGHT Consulting Limited 95478

Client Reference Maintenance Dredging AA1146

Order No

Results To *Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.*

- [x] *Email Primary Contact*
- [ ] *Email Submitter*
- [ ] *Email Client*
- [ ] *Email Other*
- [ ] *Other*

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories
- [x] *Tick if you require COC to be emailed back*

Date & Time: 08/03/17
Name: M. Poynter
Signature: [signature]

Received at Hill Laboratories
Date & Time: 10/3/17 1001
Name: Jason M
Signature: [signature]

Condition
- [ ] *Room Temp*
- [ ] *Chilled*
- [ ] *Frozen*

Temp: 17.8

- [ ] Sample & Analysis details checked

Signature:

ADDITIONAL INFORMATION

Marine Sediments
~~[illegible] not required~~
Note Se1 is sediment sample to be used in the elutriate test

Priority [ ] Low [ ] Normal [x] High
[ ] **Urgent** (ASAP, extra charge applies, please contact lab first)

NOTE: The estimated turnaround time for the types and number of samples and analyses specified on this quote is by 4:30 pm, 7 working days following the day of receipt of the samples at the laboratory.

Requested Reporting Date:

Quoted Sample Types

Sediment (Sed), Saline Elutriation Extract (ElSal)

No.	*Sample Name*	*Sample Date/Time*	*Sample Type*	*Tests Required*
1	S5 (~~[illegible]~~) x2	07/03/17	Se	As per quote attached
2	~~S6 x 2~~	~~07/03/17~~	~~Se~~	
3	Se1 x 2	07/03/17	Se ~~Water~~	✓ (~~[illegible]~~)
4				
5	Couldn't collect site 6			
6	Se1 (sea water)		Water	
7				
8				
9				
10				

Hill Laboratories
TRIED, TESTED AND TRUSTED

R J Hill Laboratories Limited
1 Clyde Street Hamilton 3216
Private Bag 3205
Hamilton 3240 New Zealand

T 0508 HILL LAB (44 555 22)
T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Job Information Summary

Client:	4SIGHT Consulting Limited	**Lab No:**	1737090
Contact:	Pamela Kane-Sanderson	**Date Registered:**	10-Mar-2017 10:00 am
	C/- 4SIGHT Consulting Limited	**Priority:**	High
	PO Box 402053	**Quote No:**	83545
	Tutukaka 0153	**Order No:**	AA1146
		Client Reference:	Maintenance Dredging AA1146
		Add. Client Ref:	
		Submitted By:	Pamela Kane-Sanderson
		Charge To:	4SIGHT Consulting Limited
		Target Date:	20-Mar-2017 4:30 pm

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
1	Se5 07-Mar-2017	Sediment	GSoil300, PSoil250	Heavy metal, trace level As,Cd,Cr,Cu,Ni,Pb,Zn; Elutriation testing; Total Petroleum Hydrocarbons in Soil
2	Se1 07-Mar-2017	Sediment	GSoil300, PSoil500	Heavy metal, trace level As,Cd,Cr,Cu,Ni,Pb,Zn; Elutriation testing; Total Petroleum Hydrocarbons in Soil
3	Se1 (sea water) 07-Mar-2017	Saline	cUP5L	Total Arsenic; Total Cadmium; Total Chromium; Total Copper; Total Lead; Total Nickel; Total Zinc; Total Petroleum Hydrocarbons in Water
4	Se5 [Elutriate]	Saline Elutriation Extract	ElutExt	Total Arsenic; Total Cadmium; Total Chromium; Total Copper; Total Lead; Total Nickel; Total Zinc; Total Petroleum Hydrocarbons in Water
5	Se1 [Elutriate]	Saline Elutriation Extract	ElutExt	Total Arsenic; Total Cadmium; Total Chromium; Total Copper; Total Lead; Total Nickel; Total Zinc; Total Petroleum Hydrocarbons in Water

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Saline

Test	Method Description	Default Detection Limit	Sample No
Total Petroleum Hydrocarbons in Water	Hexane extraction, GC-FID analysis US EPA 8015B/MfE Petroleum Industry Guidelines [KBIs:2803,10734]	0.10 - 0.7 g/m^3	3-5
Total Digestion of Saline Samples	Nitric acid digestion. APHA 3030 E 22nd ed. 2012 (modified).	-	3-5
Total Arsenic	Nitric acid digestion, ICP-MS with dynamic reaction cell, ultratrace. APHA 3125 B 22nd ed. 2012.	0.0042 g/m^3	3-5
Total Cadmium	Nitric acid digestion, ICP-MS, ultratrace level. APHA 3125 B 22nd ed. 2012.	0.00021 g/m^3	3-5
Total Chromium	Nitric acid digestion, ICP-MS with dynamic reaction cell, ultratrace. APHA 3125 B 22nd ed. 2012.	0.0011 g/m^3	3-5
Total Copper	Nitric acid digestion, ICP-MS with dynamic reaction cell, ultratrace. APHA 3125 B 22nd ed. 2012.	0.0011 g/m^3	3-5
Total Lead	Nitric acid digestion, ICP-MS, ultratrace level. APHA 3125 B 22nd ed. 2012.	0.0011 g/m^3	3-5
Total Nickel	Nitric acid digestion, ICP-MS with universal cell, ultratrace. APHA 3125 B 22nd ed. 2012.	0.0011 g/m^3	3-5
Total Zinc	Nitric acid digestion, ICP-MS with dynamic reaction cell, ultratrace. APHA 3125 B 22nd ed. 2012.	0.0042 g/m^3	3-5

Sample Type: Sediment

Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-2

Sample Type: Sediment			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Heavy metal, trace level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, trace level.	0.010 - 0.4 mg/kg dry wt	1-2
Elutriation testing	Extn with (client supplied) water, eg seawater, Sed:Water 1:4 by vol, mix 30 min, settle 1 hr, filtration or centrifugation. US EPA 503/8-91/001, "Evaluation of Dredged Material for Ocean Disposal".	-	1-2
Total Petroleum Hydrocarbons in Soil	Sonication extraction in DCM, Silica cleanup, GC-FID analysis US EPA 8015B/MfE Petroleum Industry Guidelines. Tested on as received sample [KBIs:5786,2805,10734]	8 - 60 mg/kg dry wt	1-2
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	1-2
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1-2

Appendix E:

Hill Laboratory Analysis Report

Hill Laboratories
TRIED, TESTED AND TRUSTED

R J Hill Laboratories Limited
1 Clyde Street Hamilton 3216
Private Bag 3205
Hamilton 3240 New Zealand

T 0508 HILL LAB (44 555 22)
T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

ANALYSIS REPORT

Client:	4SIGHT Consulting Limited	**Lab No:**	1737090 SPv2
Contact:	Pamela Kane-Sanderson	**Date Received:**	09-Mar-2017
	C/- 4SIGHT Consulting Limited	**Date Reported:**	13-Apr-2017 **(Amended)**
	PO Box 402053	**Quote No:**	83545
	Tutukaka 0153	**Order No:**	AA1146
		Client Reference:	Maintenance Dredging AA1146
		Submitted By:	Mark Poynter

Sample Type: Saline

Sample Name:		Se1 (sea water) 07-Mar-2017				
Lab Number:		1737090.3				
Individual Tests						
Total Arsenic*	g/m³	< 0.0042	-	-	-	-
Total Cadmium*	g/m³	< 0.00021	-	-	-	-
Total Chromium*	g/m³	< 0.0011	-	-	-	-
Total Copper*	g/m³	0.0017	-	-	-	-
Total Lead*	g/m³	< 0.0011	-	-	-	-
Total Nickel*	g/m³	< 0.007	-	-	-	-
Total Zinc*	g/m³	< 0.0042	-	-	-	-
Total Petroleum Hydrocarbons in Water						
C7 - C9*	g/m³	< 0.10	-	-	-	-
C10 - C14*	g/m³	< 0.2	-	-	-	-
C15 - C36*	g/m³	< 0.4	-	-	-	-
Total hydrocarbons (C7 - C36)*	g/m³	< 0.7	-	-	-	-

Sample Type: Sediment

Sample Name:		Se5 07-Mar-2017	Se1 07-Mar-2017			
Lab Number:		1737090.1	1737090.2			
Individual Tests						
Dry Matter	g/100g as rcvd	44	45	-	-	-
Total Recoverable Mercury	mg/kg dry wt	0.070	0.059 #1	-	-	-
Total Recoverable Silver	mg/kg dry wt	0.08	0.07	-	-	-
Heavy metal, trace level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	7.0	6.6	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.084	0.079	-	-	-
Total Recoverable Chromium	mg/kg dry wt	18.6	17.5	-	-	-
Total Recoverable Copper	mg/kg dry wt	18.5	18.1	-	-	-
Total Recoverable Lead	mg/kg dry wt	9.9	9.2	-	-	-
Total Recoverable Nickel	mg/kg dry wt	19.8	19.0	-	-	-
Total Recoverable Zinc	mg/kg dry wt	61	59	-	-	-
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 16	< 15	-	-	-
C10 - C14	mg/kg dry wt	< 40	< 30	-	-	-
C15 - C36	mg/kg dry wt	< 70	< 60	-	-	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 110	< 110	-	-	-

Sample Type: Aqueous

Sample Type: Aqueous						
Sample Name:		Se5 [Elutriate]	Se1 [Elutriate]			
Lab Number:		1737090.4	1737090.5			
Individual Tests						
Total Arsenic*	g/m³	0.0181	0.0187	-	-	-
Total Cadmium*	g/m³	< 0.00021	< 0.00021	-	-	-
Total Chromium*	g/m³	< 0.0011	< 0.0011	-	-	-
Total Copper*	g/m³	< 0.0011	0.0019	-	-	-
Total Lead*	g/m³	< 0.0011	< 0.0011	-	-	-
Total Nickel*	g/m³	< 0.007	< 0.007	-	-	-
Total Zinc*	g/m³	< 0.0042	< 0.0042	-	-	-
Total Petroleum Hydrocarbons in Water						
C7 - C9	g/m³	< 0.10	< 0.10	-	-	-
C10 - C14	g/m³	< 0.2	< 0.2	-	-	-
C15 - C36	g/m³	< 0.4	< 0.4	-	-	-
Total hydrocarbons (C7 - C36)	g/m³	< 0.7	< 0.7	-	-	-

Analyst's Comments

#1 The replicate analyses performed on the sample showed greater Relative Standard Deviation for Mercury than would normally be expected. The Relative Standard Deviations for this sample was 22%. Please interpret these results with caution.

Amended Report: This report replaces an earlier report issued on 27 Mar 2017 at 11:09 am
Reason for amendment: Results for Mercury and Silver have been added to samples 1737080.1 and .2 at the client's request.

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Saline			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Total Petroleum Hydrocarbons in Water*	Hexane extraction, GC-FID analysis US EPA 8015B/MfE Petroleum Industry Guidelines [KBIs:2803,10734]	0.10 - 0.7 g/m³	3-5
Total Digestion of Saline Samples*	Nitric acid digestion. APHA 3030 E 22nd ed. 2012 (modified).	-	3-5
Total Arsenic*	Nitric acid digestion, ICP-MS with dynamic reaction cell, ultratrace. APHA 3125 B 22nd ed. 2012.	0.0042 g/m³	3-5
Total Cadmium*	Nitric acid digestion, ICP-MS, ultratrace level. APHA 3125 B 22nd ed. 2012.	0.00021 g/m³	3-5
Total Chromium*	Nitric acid digestion, ICP-MS with dynamic reaction cell, ultratrace. APHA 3125 B 22nd ed. 2012.	0.0011 g/m³	3-5
Total Copper*	Nitric acid digestion, ICP-MS with dynamic reaction cell, ultratrace. APHA 3125 B 22nd ed. 2012.	0.0011 g/m³	3-5
Total Lead*	Nitric acid digestion, ICP-MS, ultratrace level. APHA 3125 B 22nd ed. 2012.	0.0011 g/m³	3-5
Total Nickel*	Nitric acid digestion, ICP-MS with universal cell, ultratrace. APHA 3125 B 22nd ed. 2012.	0.0011 g/m³	3-5
Total Zinc*	Nitric acid digestion, ICP-MS with dynamic reaction cell, ultratrace. APHA 3125 B 22nd ed. 2012.	0.0042 g/m³	3-5

Sample Type: Sediment			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-2
Heavy metal, trace level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, trace level.	0.010 - 0.4 mg/kg dry wt	1-2
Elutriation testing*	Extn with (client supplied) water, eg seawater, Sed:Water 1:4 by vol, mix 30 min, settle 1 hr, filtration or centrifugation. US EPA 503/8-91/001, "Evaluation of Dredged Material for Ocean Disposal".	-	1-2
Total Petroleum Hydrocarbons in Soil	Sonication extraction in DCM, Silica cleanup, GC-FID analysis US EPA 8015B/MfE Petroleum Industry Guidelines. Tested on as received sample [KBIs:5786,2805,10734]	8 - 60 mg/kg dry wt	1-2

Sample Type: Sediment			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	1-2
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1-2
Total Recoverable Mercury	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, trace level. US EPA 200.2.	0.010 mg/kg dry wt	1-2
Total Recoverable Silver	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, trace level. US EPA 200.2.	0.02 mg/kg dry wt	1-2

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

Carole Rodgers-Carroll BA, NZCS
Client Services Manager - Environmental