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Eastland Port

EASTLAND PORT UPPER LOGYARD ANNUAL HARBOUR SEDIMENT MONITORING REPORT

For Eastland Port Limited

May 2021

REPORT INFORMATION AND QUALITY CONTROL

Prepared for:	Eastland Port Limited

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Document Name	EPL_ULY Sediment Monitoring 2021_V1.0_18_05_21

Version History:	V1.0	18/05/21

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CONTENTS Page

List of Tables

List of Appendices

1 INTRODUCTION

This report has been prepared for Eastland Port Ltd (Eastland Port) by 4Sight Consulting Limited (4Sight).

Resource Consents LR-2011-105808-00 and DW-2011-105049-00, held by Eastland Port for the Upper Logyard, required baseline sampling of sediments in the harbour. The baseline survey was undertaken in December 2015 and reported to Gisborne District Council (GDC) in March 2016[1]. Following the baseline survey, and as required by the consent condition, a follow-up survey was undertaken in March 2017 and reported to GDC in May 2017[2].

Subsequent to the 2017 reporting, annual surveys have been continued by Eastland Port, although this is not a requirement of the consent. Further reports were completed in 2018, 2019 and 2020. These reports were provided to GDC.

This report presents the results of sediment quality monitoring undertaken in March 2021. This is the sixth round of sediment monitoring.

1.1 Background

Consent LR-2011-105808-00 and DW-2011-105049-00, condition 34 states:

"The consent holder shall undertake an investigation to assess the concentration of log yard runoff contaminants in the inner Harbour compared to an appropriate control site.

The design of the investigation shall be prepared by a suitably qualified ecologist and submitted to the Manager within three months prior to the commencement of discharging from the stormwater treatment devices. The investigation shall include a baseline survey prior to the commencement of the discharges authorised by this consent, a follow up investigation shall be completed within 12 months from the commencement of discharging from the stormwater treatment devices. The investigation shall include but not be limited to:

- *Sampling a minimum of 6 replicate samples from harbour sediments from the inner harbour at a site about 20-30 metres from the stream confluence with the harbour and from a control site in the outer harbour.*
- *Analysing the samples for total resin acids, including but not limited to dehydroabietic acid.*
- *Reporting on potential effects of the discharge based on the results, including a comparison of samples from the 'impact site' with those from the control site.*

A report describing the investigation shall be provided to the Manager within four months of completing the investigation."

The ULY stormwater discharge under the current consent began in November 2015 and the initial baseline survey was undertaken in December 2015. There had been one stormwater discharge event prior to the December sampling. This was considered unlikely to have affected the quality of the sediments at the marine sampling locations or to have invalidated the baseline status of the December 2015 sampling. The December 2015 survey satisfied the requirements of the baseline survey in accordance with condition 34; and was presented to GDC with the following qualifications:

1) The design of the survey was submitted to GDC as part of a S127 application submitted to GDC (but subsequently withdrawn at the request of GDC) in mid-2015 (Appendix A: - refer to page 15 of letter to GDC officer Dennis Crone from Andrew Stewart Ltd (now 4Sight Consulting), dated 23/06/2015). This aspect of the monitoring was further covered during the meeting with GDC staff (D Crone) on 09 December 2015 when GDC staff were advised that the monitoring was scheduled for that day. The principal change was a reduced sample replication to three samples in total for the inner harbour. This covered the discharge plume zone, an area adjacent to the discharge plume zone; and an area within the inner harbour but removed from the discharge plume zone and its immediately adjacent area. The method of sampling for the 2021 survey was a small pipe dredge which collects a near-surface horizon of material. This was the same method as used for the baseline survey. This method

[1] Eastland Port Upper Log Yard Marine Water and Sediment Monitoring Report- March 2016 prepared for Eastland Port March 2016

[2] Eastland Port Upper Log Yard Marine Water and Sediment Monitoring Report- March 2017 prepared for Eastland Port May 2017

requires 4 to 6 dredge tows per site to obtain the requisite amount of material for analytical purposes. These subsamples are composited for analysis.

2) The opportunity was also taken in 2015 to sample a wider range of parameters than is specified in Condition 34, which only specifies resin acids. Additional parameters were sampled to increase the baseline understanding for future comparisons, and to provide for a more comprehensive understanding of the influence of the Upper Logyard discharge (if any) on marine sediments. These analyses included: total nitrogen; total phenols; seven heavy metals (As, Cd, Cr, Cu, Pb, Ni and Zn); and total Petroleum Hydrocarbons (TPH)[3].

The method of sampling for the 2021 survey was a small pipe dredge which collects a near-surface horizon of material. This was the same method as used for the baseline survey. This method requires 4 to 6 dredge tows per site to obtain the requisite amount of material for analytical purposes. These subsamples are composited for analysis.

1.2 Sampling sites

Sediment sampling sites were renumbered in March 2017 to better integrate with other sampling within the wider port. Sites are numbered as follows, and are shown on the plan included as Appendix B: (*bracketed italicised numbers* are those used in the December 2015 report, and have been included for reference):

- Site S1 *(S4)* – Inner Harbour 20-30 m south of the Kopuawhakapata Stream discharge point;
- Site S2 *(S5)* - Inner Harbour 20-30 m north of the Kopuawhakapata Stream discharge point;
- Site S3 *(S6)* – Inner Harbour adjacent to the diversion wall on the opposite side of the Inner Harbour to Sites S1 and S2;
- Site S4 *(S3)* – Outer Harbour Turning Basin adjacent to the stormwater discharge from the Southern Logyard; and
- Site S5 and S6 in the sampling plan are not monitored as part of the ULY sampling regime, but form part of the wider monitoring programme incorporating the maintenance dredging annual sampling programme.

2 MARCH 2021 SURVEY

Sampling was undertaken by 4Sight between 14:00 hrs to 16:30 hrs on 18 March 2021. A sediment sample was collected from each of the four relevant sampling sites, Site 1, 2, 3, and 4. The sample collected at Site 4, located in the turning basin, is used as a reference site for comparison of results. Conditions on the day of sampling were fine and calm.

Sediment samples were collected using a stainless-steel cylindrical pipe dredge (dimensions 30cm long x 7.5cm diameter) towed behind a small boat. This dredge skims the surface to a depth of about 5cm. Samples were stored in containers provided by Hill Laboratories and Scion respectively and placed in chilly bins onboard. Samples were dispatched by courier to the respective analytical laboratories on the day of sampling. Hill Laboratories (Hamilton) undertook the analysis of sediments for all parameters other than resin acids. Scion (Rotorua) undertook the resin acid analyses. Chain of Custody documentation is included as Appendix C.

3 RESULTS

Table 1 summarises the results from the March 2021 sampling and all previous results (December 2015 (baseline), March 2017, March 2018, March 2019 and May 2020[4]). Full analytical results for the 2021 sampling are included in Appendix D.

The four sediment samples collected as part of the Upper Logyard monitoring comprise three Inner Harbour sites (Sites 1, 2 and 3) and one Outer Harbour 'reference' site (Site 4). Sediments were in all cases mud with a minor

[3] This wider array of parameters has been continued from the initial sampling, with a further two metals (Ag and Hg) also included from March 2018 onwards.

[4] It is noted the 2020 sampling was delayed due to the outbreak of the covid 19 pandemic.

component of fine sand. Chemical analyses were undertaken on the bulk material. No sieving was undertaken to isolate the finer (<63µm) grain size fraction for analysis.

There are no marine sediment quality limits or guideline values specified as consent trigger values in the consent. Results are compared to the ANZECC 2000[5] Interim Sediment Quality Guidelines (ISQG) - low values and the updated (ANZAST 2018)[6] default guideline values (DGV's).

Metal concentrations can also be compared with monitoring data collected as part of the maintenance dredging programme. Dredging data is available for three sites in the outer harbour (S4, S5 and S6). Between two and nine surveys have been undertaken at each site over the period 2006 to 2018. The range of results reported is included in Table 1.

[5] ANZECC, "Australian and New Zealand Guidelines for Fresh and Marine Water Quality" (Canberra, 2000) vol 1.

[6] ANZAST, "Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)".

Table 1: March 2021 sample results compared with ANZECC 2000 ISQG low values, ANZAST 2018 DGV's, 2020, 2019, 2018, 2017 and 2015 data (brackets) and maintenance dredging monitoring data. Results are highlighted orange if they exceed ANZECC 2000 ISQG low values. (It is noted that the 2021, 2020 and 2015 surveys used a pipe dredge. The 2017-2019 surveys used a small box dredge)

Sediment Parameter	**Units**	**ANZECC 2000 ISQG-Low**	**ANZAST 2018 DGV's**	**2021 Inner Harbour/Marina (2020, 2019,2018, 2017, 2015 Results in brackets)**			**2021 Outer Harbour/Turning Basin *(2020, 2019,2018, 2017, 2015 Results in brackets)***	**Maintenance Dredging Range (2006 to 2021)**
				Site S1/*(S4)*	**Site S2/*(S5)***	**Site S3/*(S6)***	**Site 4/*(S3)***	
Organic Matter	g/100g dry wt	nv	nv	8 (7.0, 10.2, 8.1, NA, NA)	10 (9.1, 8.2, 11.3, NA, NA)	7 (4.4, 5.6, 7.1, NA, NA)	7 (5.6, 6.5, 6.5, NA, NA)	
Dry Matter	g/100g	nv	nv	44 (42, 42.3, 42, 47.0, 44.0)	43 (47, 44.2, 47, 44, 47.8)	50 (55, 49.1, 56, 51, 51.5)	48 (54, 55, 54, 55, 58.7)	
Total Nitrogen	g/100g dry wt	nv	nv	0.14 (0.12, 0.198, 0.12, 0.21, 0.125)	0.20 (0.17, 0.136, 0.2, 0.12, 0.16)	<0.13 (<0.13, 0.109, 0.07, 0.18, 0.11)	<0.13 (<0.13, 0.086, 0.1, 0.1, 0.06)	
Phenols by GC-MS (bold)/*Total phenols by segmented flow colorimetry (italics)*	mg/kg dry wt	nv	nv	**<0.3 (<0.3, <0.3, <0.3, <0.3,** *<2*)	**<0.3 (<0.3, <0.3, <0.3, <0.3**, *<3*)	**<0.3 (<0.2, <0.3, <0.2, <0.3,** *<2*)	**<0.3 (<0.2, <0.2, <0.2, <0.2**, *>2*)	
Total Arsenic	mg/kg dry wt	20	20	8.9 (8.8, 8.08, 7.7, 6.7, 6.74)	8.8 (7.7, 7.17, 8.0, 7.9, 7.16)	7.1 (5.5, 6.07, 4.4, 4.7, 6.73)	6.6 (6.4, 6.4, 7.7, 6.9, 5.0)	4.3 – 7.75 (n = 5)
Total Cadmium	mg/kg dry wt	1.5	1.5	0.188 (0.096, 0.230, 0.092, 0.22, 0.12)	0.173 (0.164, 0.102, 0.20, 0.102, 0.141)	0.051 (0.060, 0.075, 0.063, 0.073, <0.10)	0.068 (0.058, 0.070, 0.079, 0.08, <0.10)	0.021 - 0.12 (n = 10)
Total Chromium	mg/kg dry wt	80	80	21 (21, 18.5, 17.8, 19, 18.6)	18.8 (18.9, 18.6, 16.8, 20, 18.5)	18.0 (18.1, 17.6, 13.4, 17.2, 18.0)	15.6 (14.1, 14.8, 15.4, 17.1, 12.4)	8.5 - 22.1 (n = 10)
Total Copper	mg/kg dry wt	65	65	42 (46, 35.6, 32, 38, 19.1)	46 (46, 30.9, 36, 34, 25.8)	29 (22, 21.5, 12.1, 16.4, 18.0)	17.5 (17.9, 15.2, 18.0, 16.2, 9.8)	3.0 - 18.5 (n = 10)
Total Lead	mg/kg dry wt	50	50	18.9 (19.9, 29.0, 15.5, 33, 13.6)	35 (28, 16.7, 34, 13.8, 21.4)	12.2 (11.5, 11.1, 7.8, 8.9, 11.1)	9.2 (8.0, 8.4, 9.3, 8.7, 7.58)	4.1 - 10.3 (n = 10)

Sediment Parameter	Units	ANZECC 2000 ISQG-Low	ANZAST 2018 DGV's	2021 Inner Harbour/Marina (2020, 2019,2018, 2017, 2015 Results in brackets)			2021 Outer Harbour/Turning Basin *(2020, 2019,2018, 2017, 2015 Results in brackets)*	Maintenance Dredging Range (2006 to 2021)
Total Mercury	mg/kg dry wt	0.15	0.15	0.08 (0.07, 0.066, 0.06, NA, NA)	0.07 (0.07, 0.064, 0.06, NA, NA)	0.06 (0.05, 0.073, 0.04, NA, NA)	0.05 (0.06, 0.0439, 0.05, NA, NA)	0.015 - 0.07 (n = 10)
Total Nickel	mg/kg dry wt	21	21	18.9 (20, 16.0, 19.8, 17.4, 21.1)	18.3 (17.7, 17.3, 17.2, 20, 19.6)	15.9 (17.6, 16.3, 16.1, 18.5, 18.9)	17.4 (16.0, 15.2, 19.0, 19, 15.9)	11.1 - 19.8 (n = 5)
Total Silver	mg/kg dry wt	1	1	0.09 (0.077, 0.06, NA, NA)	0.10 (0.064, 0.08, NA, NA)	0.05 (0.048, 0.03, NA, NA)	0.06 (0.058, 0.06, NA, NA)	<0.02 - 0.08 (n = 5)
Total Zinc	mg/kg dry wt	200	200	143 (158, 257, 104, 260, 81)	250 (250, 123, 231, 104, 131)	92 (83, 87, 53, 64, 69)	67 (64, 58.4, 62, 58, 46.7)	28 - 64 (n = 10)
Polycyclic Aromatic Hydrocarbons								
Benzo[a]anthracene	mg/kg dry wt	0.261	nv	<0.1 (<0.1 <0.1, <0.1, 0.12)	<0.1 (<0.1, <0.1, <0.1, Trace)	<0.1 (<0.1, <0.1, <0.1, Trace)	<0.1 (<0.1, <0.1, <0.1, Trace)	
Benzo[a]pyrene	mg/kg dry wt	0.430	nv	<0.13 (<0.13, <0.13, <0.14, 0.14)	<0.13 (<0.12, 0.13, 0.12, Trace)	<0.11 (<0.1, <0.13, <0.1, Trace)	<0.12 (<0.1, <0.10, <0.11, Trace)	
Fluoranthene	mg/kg dry wt	0.600	nv	<0.1 (<0.1, 0.125, <0.1, 0.21)	0.14 (0.12, <0.10, 0.162, Trace)	<0.1 (<0.1, <0.1, <0.1, Trace)	<0.1 (<0.1, <0.1, <0.1, Trace)	
Phenanthrene	mg/kg dry wt	0.240	nv	<0.1 (<0.1, <0.1, <0.1, 0.11)	<0.1 (<0.1, <0.1, <0.1, Trace)	<0.1 (<0.1, <0.1, <0.1, Trace)	<0.1 (<0.1, <0.1, <0.1, Trace)	
Pyrene	mg/kg dry wt	0.665	nv	0.11 (<0.1, 0.145, <0.1, 0.25)	0.17 (0.14, <0.10, 0.202, Trace)	<0.1 (<0.1, <0.1, <0.1, Trace)	<0.1 (<0.1, <0.1, <0.1, Trace)	
Resin Acids								
Total Resin Acids	µg/kg dry wt	nv	nv	0.4 (1.3, 0.9, 1.2, 2.9, 0.3)	3.5 (2.5, 0.7, 1.8, n.d., 0.8)	0.2 (0.7, 0.5, 0.3, n.d., 0.4)	0.2 (1.2, 0.8, 1.3, n.d., n.d.)	
Dehydroabietic acid	µg/kg dry wt	nv	nv	0.4 (1.3, 0.9, 0.9, 0.2, NA)	1.6 (1.8, 0.7, 1.1, 0.5, NA)	0.2 (0.7, 0.5, 0.3, 0.2, NA)	0.2 (0.9, 0.8, 1.3, n.d., NA)	

Sediment Parameter	Units	ANZECC 2000 ISQG-Low	ANZAST 2018 DGV's	2021 Inner Harbour/Marina (2020, 2019,2018, 2017, 2015 Results in brackets)			2021 Outer Harbour/Turning Basin *(2020, 2019,2018, 2017, 2015 Results in brackets)*	Maintenance Dredging Range (2006 to 2021)
Total Petroleum Hydrocarbons								
C7-C9	mg/kg dry wt	100[7]	nv	<14 (<14, <14, <15, NA, NA)	<14 (<13, <14, <13, NA, NA)	<12 (<11, <12, <11, NA, NA)	<12 (<11, <11, <11, NA, NA)	
C10-C14	mg/kg dry wt	500[7]	nv	<30 (<30, <30, <30, NA, NA)	<30 (<30, <30, <30, NA, NA)	<30 (<30, <30, <30, NA, NA)	<30 (<30, <30, <30, NA, NA)	
C15-C36	mg/kg dry wt	nv	nv	<60 (<60, 129, <60, NA, NA)	134 (81, <60, 240, NA, NA)	<50 (<50, <50, <80, NA, NA)	<50 (<50, <50, <80, NA, NA)	
Total	mg/kg dry wt	nv	280	<100 (<100, 129, <100, NA, NA)	136 (90, <100, 240, NA, NA)	<90 (<80, <90, <80, NA, NA)	<90 (<80, <80, <80, NA, NA)	

[7] Contaminated Sites Management Series. Assessment Levels for Soil, Sediment and Water. February 2010. Department of Environment and Conservation., Version 4. Revision 1. (Australia)

Sediment results can be summarised as follows:

- **Organic matter**: Organic matter content at Sites 1 to 4 ranged between 7% to 10%. Site 2 had the highest levels and Site 3 and 4 had the lowest levels. The higher values at Site 2 are consistent with this site being closest to the Kopuawhakapata Stream discharge. Although organic matter content increased in 2021 compared to 2020, the 2021 values were generally within the range previously reported.
- **Total Nitrogen**: ANZAST 2018 guidelines do not include trigger values for sediment nutrients, and there are currently no nationally accepted trigger values for nutrients in marine sediment. However, Robertson and Stevens (2007)[8] developed a classification (Table 2) for sediment nutrients that provides a useful comparison and a relative measure of the degree to which sediments can be considered 'enriched'.

Table 2: March 2021 Total Nitrogen in marine sediments compared to Robertson and Stevens (2007) nutrient guidelines.

Rating	Total Nitrogen (TN) (g/100g)	Gisborne Marina Inner Hbr/Marina (g/100g)			Gisborne Port Outer Hbr/Turning Basin (g/100g)
		Site1	Site 2	Site 3	Site 4
Very Good	< 0.05				
Low-Mod Enrichment	0.05 – 0.2	0.14	0.2	<0.13	<0.13
Enriched	>0.2 – 0.4				
Very Enriched	> 0.4				

All sites fall into the low-moderately enriched TN category with Site 2 on the upper limit to the enriched TN category. TN values were consistent with those previously reported.

- **Phenols** were below analytical detection limits. There is no ANZECC 2000 or ANZAST 2018 guideline for Phenol in sediments.
- **Metals** were characterised by the following:
  - All values except one were below the applicable ANZECC ISQG-Low value.
  - Site 2 recorded a zinc value of 250 mg/kg dry wt (shaded cell in Table 1). While this is above the ISQG-Low value of 200 mg/kg it remains well below the ISQG-High value of 410 mg/kg. Three of the last five results at this site have recorded zinc concentration greater than 200mg/kg. Given there are no known inputs of zinc from the Upper Logyard (other than potentials related incidentally to vehicles operating on the site), these results most likely reflect localised conditions (i.e. marina derived inputs) or wider scale catchment influences. Site 1 is the other site most likely to typify 'marina' influences and this too has comparatively elevated values. All zinc values other than that for Site 2, while they were below the respective trigger value, were above the values recorded in 2015 using the same sampling method. This was also true for chromium, copper and lead although the differences over the 5-year period in respect of chromium were not marked.
  - Copper, lead and zinc at the inner harbour Sites 1, 2 and 3 had concentrations that were considerably higher than the range reported for Site 4 (outer harbour control site). This is not unexpected. There was a negligible difference between arsenic, chromium, mercury, nickel and silver concentrations between the inner and outer harbour sites.
  - Nickel remains a metal that is close to the ANZECC ISQG-Low threshold at Site 1 and Site 2. The Gisborne Urban Stormwater and Sediment Study (GDC, 2014)[9] notes that nickel is a commonly elevated metal in urban

[8]Robertson, B., Stevens, L., 2007. *Waiwaka estuary 2007 fine scale monitoring and historical sediment coring*. Prepared for Environment Southland. Wriggle Limited, Nelson.

[9] L Easton. (2014). Gisborne Urban Stormwater and Sediment Study. Gisborne District Council

stormwater. There is no known source of nickel in the Upper Logyard so the elevation in the sediments is likely to reflect catchment inputs from the Kopuawhakapata Stream or potentially other non-port related sources. It is noted that concentrations of nickel at two of the three inner harbour sites (Sites 1 and 3) in 2021 were below the values reported in 2020.

- **Polycyclic Aromatic Hydrocarbons (PAH's)** were generally at trace levels at all sites. Two specific PAH species (fluoranthene and pyrene) recorded a value above the analytical detection limit at Site 2. This was the same result as reported in 2020. These results been compared with applicable ANZECC ISQG - Low values in Table 1 (refer to Table 3.5.1 in ANZECC 2000). In all cases, the sample values were well below the applicable ANZECC sediment quality guideline value, which is also the trigger value referred to in the consent.
- **Total Resin Acids (TRA)** levels are variable between sites but overall appear to be low. Values at Sites 1,3 and 4 decreased in 2021 compared to the 2020 results. Site 2 showed the highest TRA and dehydroabietic acid (DHAA) concentration which is consistent with expectations as the site most influenced by the Kopuawhakapata Stream discharge. TRA concentrations appear to have trended upwards at Site 2 since 2015 but this appears to be a localised effect and a similar trend is not reflected at the other sites. No applicable trigger value is referenced in the consent.
- **Total Petroleum Hydrocarbons (TPH)** were at trace levels at all sites except Site 2, which recorded a low value for TPH of 136 mg/kg dry wt. There is no ANZECC 2000 ISQG reference guideline for TPH or the carbon chain ranges. However, there is an ANZAST 2018 DGV for TPH of 280 mg/kg dry wt. In this case, and for indicative purposes, TPH has been compared with the ANZAST 2018 DGV, and for the carbon chain ranges, with screening criteria cited for soils (as opposed to sediments) provided in the Australian Department of Environment and Conservation, Contaminated Sites Management Series. All marine sample site values are well below the corresponding indicative guideline values.

4 CONCLUSIONS

The following conclusions are drawn:

- The results confirm low levels of metals in the marine sediments relative to sediment quality guidelines, except Zinc at Site 2. There are no specific inputs of zinc from the Upper Logyard that are likely to produce this effect. Therefore, this result is likely to reflect localised conditions (i.e. marina derived inputs) or wider scale catchment influences. Nickel at Sites 1 to 4 continues to remain close to, but below, the ANZECC 2000 ISQG-low values. Nickel too is considered to reflect influences of the wider catchment.
- The results confirm a predictable difference in the concentration of some metals between the inner and outer harbour zones. In general, inner harbour sites tend to have higher concentrations of copper, lead and zinc, which is expected given the marina and urban stormwater inputs and the reduced potential for flushing in this part of the harbour.
- Comparing 2021 values with 2015 values using the same sampling method, suggests a decline in harbour sediment quality with respect to concentrations of copper, lead and zinc over that period.
- TRA and DHAA concentrations are generally low and have not increased over time other than at Site 2 which suggests localised elevation near the Kopuawhakapata Stream outlet.
- PAH and TPH concentrations remain at very low levels, mostly below analytical detection, and are not of concern.

Appendix A:

S127 Application submitted to GDC mid-2015

ANDREW . STEWART

19 June 2015

Dennis Crone
Gisborne District Council
P O Box 747
Gisborne 4040

Dear Dennis

RE: EASTLAND PORT LTD: UPPER LOGYARD: SECTION 127 APPLICATION TO CHANGE CONSENT CONDITIONS: ASSESSMENT OF ENVIRONMENTAL EFFECTS

Further to our recent discussions above matter.

Eastland Port Ltd are seeking consent to change some of the conditions attached to the discharge (stormwater to stream) permit for the Upper Logyard. They only relate to components of the ecological, sediment and water quality monitoring requirements of the consent that we have found in preparing the draft Environmental Management Plan (EMP) for the site are uncertain, unexplained and/or unreasonable. As outlined in the draft EMP submitted to the Council earlier this year, the discharge permit enables treated stormwater from the logyard to be discharged in to the Kopuawhakapata Stream that in turn enters the coastal marine area near the marina within in the 'inner' port.

Attached as Annexure A is a completed Section 127 application form. The following information, including an Assessment of Environmental Effects (AEE), is provided in support of the application.

1. Existing Resource Consents and Basis of the Application

Eastland Port Ltd (EPL) hold four resource consents for the Upper Logyard. They are as follows:

- Land Use Consent for site earthworks, LL-2011-105050-00, which has a five year term;
- Land Use Consent for use of the site as a logyard and associated operations, LL-2011-105052, which has an unlimited term;
- Land Use Consent for construction, maintenance and use of a stormwater structure in the stream, LR 2011 -10580800, which has a 35 year term; and
- Discharge Permit for discharge of treated stormwater into the stream, DW 2011-105049-00, which has a 35 year term.

Annexure B contains copies of the four resource consents.

The Section 127 application only relates to the discharge (stormwater to stream) permit, DW 2011-105049-00. This consent, along with the associated land use consent for the new stream structure, have twenty 'general' conditions (No.'s 1-20) attached to them. These same conditions are also attached to the other two consents. No changes are proposed to these 'general' consent conditions.

The application seeks changes to nine of the sixteen conditions (No.'s 31-46) that are 'specific' to the discharge and land use consent, and then only in so far as they relate to the monitoring of treated stormwater to the stream and in turn the adjacent coastal marine area. We are also proposing an additional condition be included regarding consent holder initiated changes to the monitoring programme. No changes are being proposed to the conditions relating to construction and maintenance of the new stormwater structure in the stream.

The application seeks changes to the following consent conditions:

- Condition 24 relating to the water quality monitoring programme in so far as a minor wording change is sought to the term 'parameter limits' to include 'and indicators';
- Condition 25 relating to reporting of the programme results after the first two years if 100% compliance is not achieved;
- Condition 26 in so far as clarifying what parameters are to be sampled at each of the sampling sites and not requiring sampling at Site 1 (the log yard catchment pit prior to the stormwater treatment system).
- Condition 27 which contains a table of water quality parameter limits and where a request is made to replace the Biological Oxygen Demand (BOD_5 'parameter limit' with two other 'parameter indicators', being Chemical Oxygen Demand (COD) and Total Organic Carbon (TOC);
- Condition 28 which requires EPL to establish 'terms of reference' for determining a methodology and 'compliance limit' for colour and visual clarity. The existing condition does not accurately reflect the RMA Section 1071(d) requirements, the methodology for visual clarity can be included in the Condition 27 table of 'parameter limits and indicators'.
- Condition 30 relating to any exceedance of any 'parameter limit' at sampling site 3 (being the downstream compliance monitoring site). The condition wording is to be reordered to make it clear that Site 3 values are considered in relation to the upstream (background) site water quality during any sampling episode and furthermore that metals levels at the compliance site, and the need for further actions, are assessed as the average of four measurements each calendar year.
- Condition 32 relating to the extent and form of the Whole Effluent Toxicity (WET) testing of selected marine species to samples of stormwater collected from the site discharge and the stream, along with sea water as a 'control'. The proposed changes are relatively minor in nature.
- Condition 33 that requires investigation of the potential bioaccumulation of resin acids in rock lobster (crayfish) flesh within the inner port from the stormwater discharges. The scientific basis of the survey requirement is not clear from the consent decision and significant costs probably involving an overseas laboratory will be involved. As such it is sought to be deleted altogether.
- Condition 34 requiring a 'base line' and follow up sediment quality investigations in so far the sampling is rationalised and representative of different areas of potential effect (in this case the nearby marina area; the more distant vessel turning basin and a control site in the Turanganui River).

The aim of the application is to have a more coherent set of stormwater discharge related monitoring conditions that both EPL and its consultants and contractors can reasonably and practically understand and apply. We also expect the application will assist the Council with its regulatory responsibilities going forward.

The application is made with reference to the following documents:

- The Hearings Committee Notice of Decision report (Ref. AA446253) that is not dated;
- The evidence presented by Eastland Port at the hearing on 11 and 12 November 2013;
- The submissions made on the application and the associated evidence presented at the hearing;
- Council officer's report to the Hearings Committee dated 30 October 2013;
- A letter from Ross Sneddon of the Cawthron Institute of 12 April 2013 on ecological and sediment/water quality aspects of the application; and
- The resource consent application and supporting AEE from Insight dated September 2011.

The proposed additions to the consent conditions are shown in ***bold italics*** and the proposed deletions are shown in **bold ~~*strike out*~~**.

2. Condition 24 – Water Quality Monitoring Programme

The proposed change here simply follows from that proposed to Condition 27 later in this letter. As outlined the water quality monitoring programme is to be based around some parameter 'limits', but also some with reference to some parameters that are only of an 'indicator' nature.

> 24. "*The consent holder shall carry out water quality monitoring to check compliance with* **the *water quality*** *parameter limits* ***and indicators****, as specified in condition 27. This monitoring shall be conducted in a rain event resulting in a discharge from the treatment system. For periods when insufficient rainfall precludes the taking of water samples, the monitoring required by this condition shall be undertaken at the next available opportunity.*"

3. Condition 25 - Monitoring Frequency and Review

Two changes are proposed to this condition.

Firstly a 'blanket' 100% compliance requirement in relation to what is an intermittent stormwater discharge is not really 'effects' based. It is proposed that the need for further monitoring be decided after the significance of any 'exceedance' has been assessed and then reported to the Council. There are likely to be situations where the 'exceedance' is very small and of no 'effects' consequence.

Secondly some clarification is proposed around the number of sampling events during the initial two year period where sampling in a particular 3 month period is missed due to dry weather. Under this contingency situation the same number of sampling rounds is proposed over the two year period.

> 25. "*The monitoring required by Condition 24 shall be undertaken once every three months for the first two years of the commencement of the activity* ***(discharge), and not less than eight times over this same 2 year period,*** *and thereafter once annually. However if at any such time 100% compliance is not achieved,* ***Council may request additional three monthly monitoring*** *until compliance is achieved for two consecutive monitoring occasions."*

4. Condition 26- Water Quality Sampling Sites

Condition 26 identifies five sampling sites. It is unclear why water quality needs to be sampled at Site 1, being the catchment pit prior to the stormwater treatment system. This may be a locality EPL chooses to sample as part of its management of the logyard, or the Council could require sampling as a 'background' check if there were any concerns with the results from Site 2, below the treatment device. However we consider it has no specific purpose within the regular monitoring regime targeted at the effects of the discharge after treatment. We propose that the condition be reworded to clarify this point.

We also propose that there is clarification around the parameters to be sampled at each site. Sites 2, 3 and 4 are water quality sampling sites. Site 5 is a sediment sampling monitoring site which relates only to Condition 34. We note that a focus of Condition 27 is assessment of 'compliance'. To that end 'Compliance limits' are shown in our revised Condition 27 as well as other parameters which are to be used as 'indicators', but not for compliance purposes.

The proposed amendments to the condition are set out below.

Water quality samples shall be taken at:

(i) *The logyard catchment pit prior to the stormwater treatment system (Site 1- Appendix 1)* ***but only if requested by the Council as a background check on the monitoring results obtained from Site 2.***

(ii) *The discharge outlet from the stormwater treatment system (Site 2).*

(iii) The Kopuawhakapata Stream 20 m downstream of the mixing zone (Site 3- Appendix 1). The mixing zone is defined as the outlet of the treated discharge pipe outlet in the Kopuawhakapata Stream and up to 20m downstream of the treated discharge pipe outlet.

(iv) The Kopuawhakapata Stream immediately upstream of the western outlet discharge (Site 4 - Appendix 1).

Sediment quality samples shall be taken at:

(v) The Inner Harbour within 20m of the Kopuawhakapata Stream outlet in to the Inner harbour (Site 5-Appendix 1).

The locations of the sampling sites are depicted on the Plan in Appendix 1 attached to these conditions.

We are proposing that the better quality ASL plan in Annexure C showing the different monitoring sites, replace the current plan in the appendix to the consent.

4. Condition 27 - Water Quality Parameter Limits and Indicators

Condition 27 identifies the water quality parameters that are to be regularly tested and the 'limits' against which the results are to be compared. The advice note to the condition refers to the Australian and New Zealand Guidelines (ANZECC) for Freshwater and Marine Water Quality 2000 and the limits being based on the 'recommended 80% level of protection trigger values'. The 'limit' column of the table notes that the compliance limits (or 'trigger levels') are set for sampling Site 3, i.e. the mixing zone site in the stream 20m downstream of the actual stormwater discharge.

No 'trigger values' are specified for three parameters (i.e. volatile suspended solids, tannins and hardness). We understand that the Council required that these parameters be monitored to provide better interpretation of other parameters for which there are 'limits' and/or will be used as relative comparisons between sites and the results measures over time.

We are proposing that the table in this condition, and the related advice notes, be amended to make the above points clearer and also bring them in line with changes proposed in the recent Section 127 application for the southern logyard discharge permit. To this end we propose retaining most of the parameters, but reformatting the table in line with that proposed for the southern log yard. This is to more clearly delineate what parameters are to be used as compliance 'limits', whether they are measured at the pipe or in the receiving environment and where the 'limits' came from, i.e. ANZECC or another recognised reference source that is linked to protection of water quality and/or biota. The other purely 'indicator' parameters to be measured also require further explanation as to their purpose and reference source.

We also consider that some new wording is required in the introduction to this condition to account for the potential for the 'limits' as measured at Site 3 (the stream below the discharge) being exceeded as a consequence of background contaminant concentrations as measured at Site 4 (the stream above the discharge).

The clarifications around the compliance 'limits' are reasonably self-explanatory, other than in respect of total phenols, which are covered in more detail later in this letter. We have included in the table below the relevant ANZECC and other scientific publication references as we understand them from reading the staff report, hearing evidence and final Council decision.

27. "The samples are to be analysed for the following parameters and compared against the 'limits' ***which are to be used to assess compliance, and 'indicators' (which are not compliance based)*** *as shown"*

Discharge *Parameter*	*Limit* ***~~Note~~ compliance limits are at site 3 as depicted on the plan as attached to this consent unless otherwise stated***		***Trigger Level Reference***
	Trigger Level For Compliance Purposes	***Sampling Locations***	
Total Petroleum Hydrocarbons (TPH)	*15 g/m^3*	***Site 2***	***RMA (Marine Pollution) Regulations 1998:*** ***Regulation 9(1)(c) which allows oils (or any mixture containing oil) to be discharged from ships at a concentration of up to 15 g/m^3.***
pH	*6.7 to 8.5 –log (H+)*	***Sites 2, 3 and 4***	***Gisborne Regional Plan For Discharges To Land and Water, Waste Management and Hazardous Substances (Updated October 2012). Rule 6.5.2.(2a)***
Temperature	*The natural water temperature shall not be changed by more than 3^{0}C* ***of background at Site 4***	***Site 2, 3 and 4***	***Resource Management Act Schedule 3*** ***Clause (1) -Class AE Waters Managed For Aquatic Ecosystem Purposes***
Total Suspended Solids ***(TSS)***	*100 g/m^3 above* ***the*** *background* ***~~site~~ at Site 4***	***Site 2, 3 and 4***	***Matawhero (Dunstan Road) Cargo Yard Discharge Permit DW-2010-104235-00 - Condition 17***
Dissolved Oxygen	*Not less than 4 mg/l* ***or not less than background where this is less than 4mg/l***	***Site 3 and 4***	***Gisborne Regional Coastal Environment Plan*** ***SC Water Classification***
Dissolved Copper[1]	*0.0025g/m^3* ***as average of four quarterly samples[3]***	***Site 2, 3 and 4***	***ANZECC 2000*** ***Table 3.4.1 for the freshwater environment at the 80% species protection level***
Dissolved Zinc[1]	*0.031g/m^3* ***as average of four quarterly samples[3]***	***Site 2, 3 and 4***	***ANZECC 2000*** ***Table 3.4.1 for the freshwater environment at the 80% species protection level***
Total Phenols	***~~0.72g/m^3~~*** ***1.2 g/m^3***	***Site 2, 3 and 4***	***ANZECC 2000*** ***Table 3.4.1 for the freshwater environment at the 80% species protection level***
Visual Clarity[2]	***Not more than a 30% reduction relative to Site 4***	***Site 3 and 4***	***Ministry for the Environment: Resource Management Guidelines 1994. Water Quality Guidelines No 2: Guidelines for the Management of Water Colour and Clarity, p34***
Parameter	***Indicator***		***Value Reference***
	Guideline Level	***Sample Location***	
~~Biochemical oxygen demand (BOD_5)~~	***~~30g/m^3~~***		
Chemical Oxygen Demand	***604 g/m^3***	***Site 2 (Stormwater discharge)***	***Assessment of Log Runoff in Alberta. Results of Monitoring Programme 1996-1998. S McDougall. Southern Region, Approvals Group, Alberta Environment. June 2002.***

Total Organic Carbon	***244 g/m³***	***Site 2***	***Assessment of Log Runoff in Alberta. Results of Monitoring Programme 1996-1998. S McDougall. Southern Region, Approvals Group, Alberta Environment. June 2002.***
Volatile Suspended Solids	*To be monitored* *No ~~compliance~~ limit*	***Site 2, 3and 4***	***None known***
Settleable Solids[3]	*3g/m³*	***Site 2, 3 and 4***	***None known***
Total Nitrogen and Soluble Inorganic Nitrogen	***~~0.4g/m³~~*** ***To be monitored*** ***No limit***	***Site 2, 3 and 4***	***None known***
Total Tannins	***~~Indicative parameter~~*** ***5g/m³***	***Site 2, 3 and 4***	***Figure provided by K Hamill in evidence citing Bailey HC, Eelphrick JR, Potter A, Konasewich D, Zak JB 1999. Causes of Toxicity in Stormwater Runoff from Sawmills, environmental Toxicity & Chemistry: 8 (7) :1485-1491***
Dehydroabietic Acid (DHA)	*~~0.025 g/m³~~* ***Not specified***	***Site 2, 3 and 4***	***None ~~known~~ relevant***
Total Resin Acids	***1.0 g/m³***	***Site 2, 3 and 4***	***Figure provided by K Hamill in hearing evidence citing Tian F, Wilkins AL, Healy TA 1999. Extractives in Storm Run-off from a Major Timber Port, Tauranga, New Zealand. Journal of Marine Environmental Engineering 5: 85-105***
Hardness	*To be monitored* *No compliance limit*	***Site 2, 3 and 4***	
~~*~~	***~~Only required for samples from Sites 1, 2 and 3~~***		
1	*Based on a 1 hour test (standard method of testing)*		
~~**2**~~	***~~Incremental increase above background as sampled at site 4~~***		
3	*All to apply as an average over a calendar year*		
2	***As measured by the horizontal black disc method***		

Advice Note

*Note that **several of the** GDC **stormwater discharge parameter** limits are based on recommended 80% level of **freshwater** protection trigger values (pages 3.1-10 Australian and New Zealand Guidelines for Freshwater and Marine Water Quality version October 2000 and as recommended in the review report by Cawthron Institute to GDC Water Resources Section 12 April 2013)*

Total Petroleum Hydrocarbons (TPH)

The RMA regulation reference source added to the table for this parameter is the same as that proposed in the recent S127 application for the southern logyard.

pH and Temperature

We have reviewed the Gisborne Regional Plan for Discharges to Land and Water, Waste Management and Hazardous Substances (Last Updated October 2012) and also the Draft Freshwater Plan For the Gisborne Region (September 2014) to see if they had any pH or temperature based provisions relating

to the lower Kopuawhakapata Stream or others of a similar degraded nature. There are no such provisions to our knowledge.

However Rule 6.5.2(2a) - Point Source Discharge of Seawater from Live Lobster Holding Tanks, of the Regional Discharges Plan contains a receiving water requirement for pH. It is 6.7 to 8.5 –log (H+) which is the same as the current 'trigger value' in the table. We have referenced it on this basis. This same 'trigger value' is also one of the standards for SC classified waters in the Regional Coastal Plan. The recent Section 127 application to amend some of the water quality parameters attached to the southern logyard stormwater discharges references this same standard, so this provides some consistency.

We propose that the temperature 'trigger value' be slightly altered and related to the 'background' water temperature of the stream above the discharge (i.e. $\pm 3^0$C of 'background' temperature at Site 4) in accordance with recognised practice. We have referenced the 'trigger value' to a very similar provision in the RMA regulations for AE classified waters. This classification is directed at waters that are managed for aquatic ecosystem purposes, which is not the current situation with the stream, but onewhich also reflects the broad intent of the consent conditions. .

Total Suspended Solids

A minor amendment to this clause it proposed to reference the 'background' upstream monitoring at Site 4. We note that the 'trigger level' is the same as that in one of the conditions for the Matawhero logyard discharge permit so referenced it.

Dissolved Oxygen

We have also linked the 'trigger level' for any dissolved oxygen reduction to the upstream 'background' level at Site 4. This could be expected at times given the nature of the stream. Again, given the site specific influences on dissolved oxygen and in the absence of applicable ANZECC or other guidelines, we have referenced the Regional Coastal Plan provision for SC classified waters that apply to the waters of the adjacent marina area.

Dissolved Copper and Zinc

We have proposed making the averaging of the four quarterly results more explicit in the table. Also we have included the relevant ANZECC freshwater guidelines as the references for the 'trigger values'.

Total Phenols

The existing table has a 'limit' value of 0.72 g/m^3 for total phenols. This is the ANZECC 80% marine protection guideline and is inconsistent with other values which are based on the ANZECC 80% freshwater protection guideline. On this basis the total phenols 'limit' in the table has been corrected to 1.2g/m^3, which is the appropriate freshwater one from the ANZECC guidelines.

Visual Clarity

The proposed changes to this part of the table are explained in detail in the next part of this letter in relation to Condition 28.

Chemical Oxygen Demand and Total Organic Carbon

We are proposing to replace the BOD_5 parameter, which is of a compliance 'limit' nature with COD and TOC 'indicator' values, like with the recent southern logyard Section 127 application. The technical rationale behind the proposed change is the outlined in the ASL letter of dated 14 April 2015 on the southern logyard in Annexure D.

Settleable Solids

We are not proposing any changes to this parameter. We have been unable to find any hearing material reference or recognised guideline that explains the 'trigger value' of 3g/m^3. However we understand that EPL focused on this aspect at the hearing on the basis that benthic sediment deposits in the stream and harbour were a concern of submitters. We consider that both total suspended and settleable sediment provide important information in relation to assessing the quality of the discharge and both are retained in the monitoring programme.

We also note that this parameter is not required to be measured as part of the Matawhero logyard discharge permit and taking into account the above matters its inclusion in the monitoring programme is questioned. However we consider it is best to review its ongoing inclusion as part of proposed monitoring programme review condition that we outline later in this letter.

Volatile Suspended Solids

No changes are proposed to this parameter, which we also can find no hearing material on, including any guideline indicator values. We also note it is not monitored at the Matawhero logyard.

Total Tannins

No value for total tannins is specified in the existing table. However we note from the Council hearing evidence that Mr Keith Hamill, the EPL ecologist referred to a figure of 5 g/m^3. This was with reference to a study by Bailey et al (1999), on juvenile trout which indicated that concentrations of less than 5 g/m^3 were not associated with toxicity. We have added this publication to the table as the source reference.

Total Nitrogen and Soluble Inorganic Nitrogen

We propose deleting the 0.4gm/m^3 compliance 'limit' from the table and propose both of these parameters be measured as 'indicators' only. This is because we do not consider it appropriate to have such a limit for these nutrient parameters for the reasons covered in expert evidence by Mr Hamill at the consent hearing. Mr Hamill recommended there be no compliance limit set for these parameters and it is not clear where the existing 'limit' has come from.

Total nitrogen (TN) is the total of organic and inorganic forms of nitrogen in a sample. Soluble or dissolved inorganic nitrogen (DIN) is a calculated value being the total of nitrate + nitrite (NO_x) + ammonia (NH_4^+) in a sample. We note that Table 3.3.10 in the ANZECC 2000 guidelines provides 'default trigger values' for TN, NO_x and NH_4^+ for 'slightly disturbed ecosystems' in NZ, including 'lowland rivers'. Those 'trigger values' are: TN 0.614 g/m^3; NO_x 0.444 g/m^3 and NH_4^+ 0.021 g/m^3. Any values recorded above the 'triggers' are considered to relate to an increased probability of adverse effects due to nutrients. Having regard to the ANZECC guidelines and other publications we are unsure where the 0.4g/m^3 in the consent table comes from.

The 'background' nutrient levels in the Kopuawhakapata Stream were reported by Mr Hamill in his evidence to be high. We also expect from observing the stream that they are likely to be highly variable related to rainfall events. DIN levels in the stream were reported in the Hamill evidence at 0.93 mg/L citing GDC data from 2006 to 2012. The 'background' levels appear to be twice the figure cited in the existing consent for compliance purposes.

There is a very limited freshwater habitat downstream and marine habitat is highly modified, but well flushed. As covered by Mr Hamill in evidence, an intermittent stormwater discharge from the logyard into these respective receiving environments does not in our view carry a significant risk of nutrient related periphyton (stream) or marine algal growths.

Dehydroabeitic Acid and Total Resin Acids

The existing consent table for Condition 27 includes a 'limit' for dehydroabietic acid (DHAA). Any analysis for DHAA is also effectively an analysis for total resin acids (TRA), of which DHAA is a major constituent. Therefore, for clarity we propose to include both DHAA and TRA in the table. However, we are proposing that both of these 'limits' be made 'indicators', with no value being proposed for dehydroabeitic acid but a value included for total resin acids. In proposing these changes we have focussed primarily on the evidence Mr Hamill presented at the hearing.

In his evidence Mr Hamill indicated that the '*concentrations from the logyard are estimated to be within guideline values after mixing with the stream water*'. The 'guideline' values Mr Hamill was referring are the 0.025g/m^3 for dehydroabietic acid and 1.0g/m^3 for total resin acids found in a Province of Ontario 1988 publication. Mr Hamill indicated in the evidence that the Ontario guidelines already allowed for a 100 times protection level. That is the concentration is 100 times below that identified as causing an effect on biota. This was evidently to avoid chronic effects in rivers containing significant aquatic biota in the state. Notwithstanding that Mr Hamill predicted that the stormwater discharges from the upper log yard are expected to meet these 'guideline' values we do not consider it appropriate to use them as a compliance 'limit' for the lower Kopuawhakapata Stream.
This is on the basis that there is no accepted receiving environment 'limit' for these compounds in New Zealand or Australia (ANZECC 2000 for example).

We note that Mr Hamill cited for total resin acids a 'threshold to assess acute toxicity risk' as 1000mg/lm^3 (or 1 g/m^3). Concentrations below this level are considered to avoid such risk. We consider this is a more appropriate concentration to use as a trend analysis reference point for total resin acids for an intermittent discharge. It also serves as a 'proxy' for dehydroabietic acid which is likely to comprise a significant and consistent proportion of the total resin acid present. Mr Hamill in evidence also estimated that dehydroabietic acid comprised about 50% of the total resin acid sampled from the Port of Gisborne log yard.

5. Condition 28 – Water Colour & Clarity Monitoring

We are proposing a few changes to this condition as outlined below:

> *28.* "*The consent holder shall ~~establish a terms of reference~~ within six months of the granting of consent ~~to~~ determine a methodology and ~~compliance~~ reference limit to ~~meet the section 1071(d) Resource Management Act colour requirements~~,* ***after reasonable mixing, avoid any conspicuous change in the colour or visual clarity of the receiving waters****, to the satisfaction of the consent authority*"

The introductory words 'establish a terms of reference' are ambiguous and redundant in terms of the purpose of the condition. The reference to Section 107 (1) (d) of the RMA is unnecessarily indirect and is not helpful to people unfamiliar with, or without access to, this section of the legislation. We also note that for unexplained reasons the words 'or visual clarity' from Section 107 (1) (d) have been omitted from the condition.

We have included a methodology for visual clarity monitoring and 'trigger value' reference in the Condition 27 table. They are that there not be more than a 30% reduction in stream horizontal visual clarity as measured by horizontal black disk. The measurement is proposed to be at the downstream sampling location closest to the discharge (Site 3) and compared with the upstream 'background' sampling location (Site 4).

This proposal, as noted in the table, is based on the Ministry for the Environment 1994 Guidelines for the Management of Water Colour and Clarity. Guideline 1 for 'Protection Against Conspicuous Changes in Visual Clarity' effectively states 'For Class A waters' (where visual clarity is an important characteristic

of the water body) the visual clarity should not be changed by more than 20%, whereas for 'other waters' the visual clarity should not be changed by more than 33-50% depending on site conditions.

We consider that neither the immediate Kopuawhakapata Stream nor the marina receiving waters into which it discharges are 'Class A waters' with 'important visual clarity characteristics'. We have for similar reasons selected the 'bottom' percentage parameter for 'other waters' in the guideline. The guidelines states: '…*Protection of the visual clarity of waters will usually ensure that colour and light penetration are not degraded. This is fortunate because visual clarity is the most easily measured aspect of the optical quality*…'

In dealing with this matter we consider it important that the word 'conspicuous' referred to in Section 107(1) (d) is brought within the body of the condition, so this is clear all parties interested in this matter. The Collins dictionary of 'conspicuous' refers to a change that is 'clearly visible, noteworthy or striking'. So the change in visual clarity, after an allowance for mixing, has to have an element of scale or magnitude and is not trivial. As outlined above we have proposed using the horizontal black disk measurement method and this is recorded in footnote 3 to the table. It is a well-known and commonly used method which quantifies the effect on water clarity. Any change of at least 30% can in our view be taken as a 'proxy' for a 'conspicuous change' in terms of Section 107(1) (d).

6. Condition 30 –Non-Compliant Monitoring Results

We suggest some minor changes to the first and second paragraphs (only) of this condition as outlined below.

30. *"If a sampling result outlined in Condition 27 shows a parameter limit (**trigger level**) is exceeded at Site 3, **or if the calendar year average for zinc and copper exceeds the respective parameter limit**, the consent authority is to be immediately notified and the result of the water sampling shall be forwarded to the Consent authority by the end of the next working day following receipt. Another sample shall be taken for the failed parameter test at the next available time that there is sufficient runoff to enable sampling to occur, unless other directed by the consent authority"*

    *This condition shall not apply if the variable also exceeds the trigger value at Site 4 (upstream **of the discharge**) by the same or similar value or greater"*

The proposed addition regarding zinc and copper results is simply tied to the existing requirement for quarterly averaging of the annual results as set out in the table. The other additions are just to make things clearer for people using the condition.

7. Condition 32 - WET Testing of Selected Marine Species

Several changes are proposed to this condition, which are explained in some detail below.

32. "*Whole Effluent Toxicity Test (WETT) - The consent holder shall undertake whole effluent toxicity testing (WETT) of the discharge from the stormwater treatment device~~s~~ **(Site 2).** The design of the WETT investigation shall be prepared by a suitably qualified ecologist and submitted to the consent authority within three months of discharging from the stormwater treatment device to meet S107(1)(g) RMA requirements **(that is, after reasonable mixing, to avoid any significant adverse effects on aquatic life)**. The investigation shall ~~**include a baseline survey prior to the commencement of discharges authorised by this consent and a follow up investigation shall**~~ be completed within one year of the commencement of discharging from the stormwater treatment devices. The investigation shall include, but not be limited to*:

    * *Using ~~**two**~~ species **from at least two phylogenetic groups for the WETT ~~i.e. early life stages of mussel and oxipods~~***

** The WETT shall be undertaken on a sample collected from the discharge of the stormwater treatment device, **~~and from a sample collected from the Kopuawhakapata Stream 20m downstream of the discharge. Both samples shall be collected during a rain event and at a time and at a time when the treatment devices are discharging~~**. Seawater unaffected by log yard runoff shall be collected and used as a control.*

** Reporting on the potential effects of the discharge based on the results and in the context of dilution provided by the stream and harbour.*

A report describing each investigation shall be provided to the Manager within four months of completion.

The first change simply notes that there is only one stormwater treatment device to sample from and it is at Site 2, as identified in the consent documents.

The second change simply explains the Section 107(1)(g) basis of the condition, i.e. 'significant' adverse effects on biota, so it is clear to all parties reading it.

The third change removes an error regarding a taxa, 'oxipods', that do not exist. Investigations of the WET testing regime elsewhere indicate that the specific choice of species and life history stage are best left to the independent laboratory in liaison with the independent consultant overseeing the work. Normally three (not two) phylogenetic groups representative of the biota also found in the receiving environment at the discharge site would be used. The words have been changed to better reflect this. The particular species, the species specific test applied and the toxicity 'end points' being measured need to be detailed in the methodology which is required as part of Condition 32 to be submitted to the Council in any event.

The fourth change is to remove any reference to a 'baseline' WET test of the water (during rainfall) before the stormwater discharge from the redeveloped upper log yard commences. The basis of it is not clear from the Council staff report, hearing evidence and decision we have read, and as such is questioned. Section 17.5 - Discharge of Stormwater, of the decision makes no specific reference to WET testing, including expert evidence presented at the hearing.

The intent of the consent condition is clearly to assess the effects of the logyard stormwater discharge on marine animals. Bullet point 1 refers only to early life stage mussels and 'oxipods' (sic amphipods) and bullet point 3 requires that results are interpreted in relation to the combined dilution potential from freshwater and marine water. Therefore the 'background test' is assumed to be to measure the effect of the existing stream discharge on the biota within the marine receiving environment.

A 'baseline' WET test of the existing water in the stream would provide only limited, if any, useful information specific to assessing the effect of the future stormwater discharge on the marine biota. It may say something about the ambient quality of the stream during rainfall outside of periods of stormwater discharge, but that is not a matter that EPL should be responsible for investigating.
The expert evidence presented at the consent hearing showed that the stream is highly modified and has poor habitat structure and poor water quality.

The cost of a 'baseline' WET test programme is also a relevant consideration here. Investigations indicate it would be a minimum of $8,000 to $10,000. For monitoring costs of this nature the purpose of the 'baseline' test and the linkage to the activity for which consent has been granted needs to be clear and it is not.

The fifth change concerns the sampling from the Kopuawhakapata Stream at Site 3 (downstream of the discharge). It is unclear from the wording if the condition intended that a WET test is carried out on a combined sample from the stormwater treatment device and stream, or on each sample separately. We have assumed the latter and made this clearer in the revised condition.

The information required to manage the stormwater discharge quality from the site will be derived from the in situ testing and analysis of the 18 water quality variables without the need for recourse to additional WET tests of the stream water. If the stormwater discharge WET test results showed that small amounts of dilution are all that is required to achieve no toxicity (and that is the expectation), then the WET test at the downstream site would be redundant (as would the 'baseline' WET test if that were to be required) in any event. If further WET testing is to be carried out then it would be more appropriate for it to occur after reviewing the initial stormwater discharge WET test results. On this basis we have removed the requirement for WET testing of the stream water, in addition to that from the stormwater discharge itself. As noted above this will save EPL another $8,000-10,000, at least initially until all parties have a better understanding of the testing parameters and associated limitations.

8. Condition 33 - Crayfish Flesh Survey for Resin Acids

Condition 33 requires EPL to investigate the potential bioaccumulation of resin acids in rock lobster (crayfish) flesh within the inner harbour compared to 'an appropriate control site' out of the harbour, and to report the findings to the Council. It requires that an investigation programme be designed by a suitably qualified ecologist, and be submitted to the Council at least 3 months before any stormwater discharge occurs. The consent condition does not fully prescribe the nature of the investigation to be carried out, although identifies the following requirements:

- The sampling requires 'baseline' and 'follow up' surveys of the flesh of at least five crayfish at each site;
- The samples are to be analysed for total resin acids and dehydroabietic acid (DHHA); and
- The 'follow up survey is to be completed within one year of the first discharge occurring; and
- A report on each investigation finding is to be submitted to the Council within 4 months of completion.

We propose this condition is deleted in its entirety for several reasons, as outlined below.

<u>Basis of Council Decision and Survey Costs</u>

The basis of the crayfish flesh surveys is not explained in the Council decision. Section 17.5 – Discharge of Stormwater, makes no reference to expert or other evidence on the matter.

We have contacted the following analytical laboratories about their capabilities to undertake the required analysis: Hill Laboratories (Hamilton); Scion Research (Rotorua); Cawthron Institute (Nelson) and Assure Quality (Wellington). All laboratories advised that they do not carry out this analysis. Assure indicated they could set up for the analysis, but it would be costly to do so.

An alternative would be to seek to have the samples analysed offshore. This option has not been investigated further as it is likely also to be costly, if even achievable.

<u>Limited Support from a Review of Published Literature</u>

We have reviewed the scientific literature on resin acids in order to determine if there are recognised 'limits' for resin acids in marine crayfish flesh or even potentially comparable limits for other marine crustacea or marine biota. Some confidence that this is the case would be required in order to be able to interpret the significance of any bioaccumulation of resin acids within both the 'port' juvenile crayfish and the 'wild' juvenile crayfish populations and the difference between the two.

We could find no data in the literature on resin acid constituent toxicity on NZ red rock lobster (*Jasus edwardsii*), or related species or even marine crustacea in general. They appear not to have been used as bio-monitoring tools to assess bioaccumulation in the marine environment.

In the absence of such species specific data, assessing the significance of results by extrapolating bioaccumulation and toxicity data from one taxa or phylogenetic group to another would be highly problematic.

Resin acid toxicity in freshwater fish, revealing liver biotransformation, is heavily documented for salmonid species (e.g. *Salmo gairdneri* and *Oncorhynchus mykiss*) in lakes and rivers. However freshwater biota toxicity studies are not appropriate for determining toxicity in the marine environment. Some toxicity based information is obtainable from marine environments and what there is relates primarily to investigations of large scale treated and untreated pulp and kraft mill discharges.

The scale and generally continuous nature and quality of such pulp and kraft mill discharges bears little relevance to the small scale intermittent chemically untreated stormwater discharge from the Upper Log Yard. Furthermore these large industrial discharges, while they include resin acids, they can also include a 'cocktail' of chemicals such as chlorophenols, dioxin and furans, most of which are by-products of chlorination used in the bleaching process. In this regard the stormwater discharge from the upper logyard, like other logyards needs to be clearly distinguished from other much more heavy industrial sites associated with the forestry industry.

Cherr et al., 1987[1] investigated resin acid toxicity in the sea urchin *Strongylocentrotus purpuratus*. Sea urchin sperm's ability to fertilize an egg following exposure to a toxicant is a highly sensitive measure of toxicity. This research tested specific constituents such as resin acids (abietic (AA), dehydroabietic acid (DHAA) and isopimaric acid) from paper mill effluent using a bioassay, a sea urchin sperm cell toxicity test. This highly sensitive toxicity test was employed to determine the concentrations of each chemical that inhibit fertilization. This study showed that resin acids that are normally a concern in freshwater environments, need to be one to two orders of magnitude higher in concentration to exhibit toxic effects in seawater using the sperm cell toxicity test.

The abovementioned study found that resin acids are toxic to salmonids, with LC50 values (i.e. Lethal Concentration 50 is a standard measure of toxicity of the surrounding medium that kills half the sample population of a specific test animal) between 0.2 and 0.75 mg/L. It also indicated that sea urchin fertilisation became inhibited at levels above 1.0 mg/L. This value is the same as the guideline of 1 g/m^3 (=1mg/l or 1000ug/l) we have proposed to be included in the Condition 27 table above.

Khan et al. (1992)[2] studied flounder (*Pseudopleuronectes americanus*) at three sites near a pulp and paper mill, with some data obtained before the mill was established. While effects shown from this high strength effluent included tumours and necrosis, no specific linkage between the effect and resin acids was provided or implied by this study.

Gravato et al., (2005)[3] studied marine mussels (*Mytilus galloprovincialis*) to improve knowledge of mussels response to pulp mill effluent compounds, with particular focus on resin acids, and potentially using mussels as a monitoring species around pulp mills. These authors noted that a significant percentage of pulp and paper mill effluent toxicity is attributable to resin acids and their transformation products. They cite and reference AA and DHAA as being commonly found at concentrations of 40-2500ug/L in treated effluents.

The study investigated the genotoxic effects (i.e. chemical agents that damages the genetic information within a cell causing mutations) which may lead to cancer and oxidative stress of resin acids in mussels.

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[1] Cherr, G.N., Shenker, J.M., Lundmark, C., Turner, K.O., 1987. Toxic effects of selected bleached kraft mill effluent constituents on the sea urchin sperm cell. Environ. Toxicol. Chem. 6, 561–569. doi:10.1002/etc.5620060708

[2] Khan, R.A., Barker, D., Hooper, R., Lee, E.M., 1992. Effect of pulp and paper effluent on a marine fish, Pseudopleuronectes americanus. Bull. Environ. Contam. Toxicol. 48, 449–456. doi:10.1007/BF00195646

[3] Gravato, C., Oliveira, M., Santos, M.A., 2005. Oxidative stress and genotoxic responses to resin acids in Mediterranean mussels. Ecotoxicol. Environ. Saf. 61, 221–229. doi:10.1016/j.ecoenv.2004.12.017

Mussels were exposed to 2.7 uM AA (0.82mg/L AA) and DHAA (0.81 mg/L DHAA) for 6,12, 18, and 24 h. Various enzymes were measured and effects on some enzyme functions occurred after 6 hours of exposure to this concentration but depending on the specific enzyme the range was up to 24 hours for some enzyme functions. The study confirmed the usefulness of Mediterranean mussels in monitoring the effects of pulp and paper mill effluents on marine environments.

Kinnee (2005)[4], assessed the potential effect of pulp mill effluent on the survival, growth, and condition index of marine mussels (*Mytilus edulis*). This is of some interest as it is a species also found in New Zealand. Mussels were exposed to five environmentally relevant concentrations (0.23, 0.46, 1.01, 2.07 and 4.88% v/v) of pulp mill effluent diluted with ambient seawater, and a seawater control for 89 days. This equates to a dilution a range of 434 to 20.4 times dilution. This study was undertaken at Norske Canada pulp and paper mill in British Columbia to satisfy provincial biological monitoring requirements. Mussel tissue was analysed for resin acids.

Resin acid concentrations in the mussel tissues were detectable for DHAA in effluent concentrations of 0.23, 1.01, 2.07 and 4.88% v/v and were 0.02, 0.09, 0.08 and 0.15 µg/g wet weight basis respectively. The study showed significant reduced survival in effluent concentrations 0.46 and 4.88% v/v compared to the control. No significant reductions in growth based on changes on length and whole weight were recorded. Condition indices and tissue lipid concentrations of the mussels declined significantly over the exposure compared to the control. Mussels exposed from 1.01 to 4.88% concentration had significantly decreased lipid concentrations. Only DHAA was detected in mussel tissue, at concentrations of <0.2 to 1.5 ug/g (wet weight). The pulp mill effluent was concluded as having a potential for adverse effects on the long term survival of mussels if they were continually exposed to 0.5%v/v effluent (200 times dilution).

Gravato and Santos, (2002)[5] looked at sea bass responses over 0, 2, 4, 6, and 8 hours, to realistic and environmentally relevant AA or DHAA concentrations (0, 0.0125, 0.025, 0.05, 0.1, 0.3, 0.9, 2.7 µM). Liver damage was measured and liver somatic index (LSI) was used as a general health indicator. A range of enzymatic and other responses were observed with specific responses depending on the concentration and the duration of exposure. DHAA was found to be more genotoxic than AA.

Maria et al, (2002)[6] also reported genotoxic and liver biotransformation responses to AA in adult eels (*Anguilla anguilla*) at concentrations up to 2.7uM (0.03 to 0.8mg/l) and exposures ranging from 8 to 72 hours.

Hernández et al., (2008)[7] looked at kraft mill effluent toxicity on two flounder species (*Paralychtys microps* and *Paralychtys adspersus* in Golfo de Arauco, off central southern Chile. This is a highly productive marine area with important commercial fisheries.

This study reported that an efficient way to evaluate the degree of exposure of a fish to a certain pollutant, is to measure the concentration of the compounds or its metabolites in the bile fluids. In this study, resin acids were considered as useful biomarkers for exposure to this type of effluent. The study found a presence of resin acids in bile from these two flounder species, with DHAA found on average at 17.5 µg/g. However the study involved small sample sizes.

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[4] Kinnee, K.J., 2005. *Effects of pulp mill effluent on marine mussels in an on-site, flow-through bioassay*. Master of Science Thesis. University of British Columbia.

[5] Gravato, C., Santos, M.A., 2002. Juvenile Sea Bass Liver Biotransformation Induction and Erythrocytic Genotoxic Responses to Resin Acids. Ecotoxicol. Environ. Saf. 52, 238–247. doi:10.1006/eesa.2002.2161

[6] Maria, V.L., Correia, A.C., Santos, M.A., 2004. *Anguilla anguilla L. genotoxic and liver biotransformation responses to abietic acid exposure.* Ecotoxicol. Environ. Saf. 58, 202–210. doi:10.1016/j.ecoenv.2003.12.005

[7] Hernández, V., Silva, M., Gavilán, J., Jiménez, B., Barra, R., Becerra, J., 2008. Resin acids in bile samples from fish inhabiting marine waters affected by pulp mill effluents. J. Chil. Chem. Soc. 53, 1718–1721. doi:10.4067/S0717-97072008000400018

Limited Application of Published Study Findings to the Port of Gisborne

A review of the scientific literature on resin acids found that elevated concentrations of AA and DHAA have been reported to show toxicity in marine animals under conditions of sustained exposure. One of the studies (Kinee 2005), provides tissue flesh concentrations for a marine mussel species *(Mytilus edulis)*, which also occurs in NZ. This species could potentially be used as a bio-monitoring tool, which would tie in with the likely use of the same species in the WET testing. Another study on eels (Maria et al 2002) is also of some interest in that the species is of the same genus (Anguilla) as NZ's two species of endemic eel. Although eels pass through the Gisborne port area as a part of inward and outward migration, the juvenile inward migrants will do this quickly and the outward migrants are non-feeding. Therefore effects on eels are unlikely and the relevance of using them for bio-monitoring would be questionable.

Overall, it is our view that there is no merit in pursuing the requirements of Condition 33 in respect of resin acids testing of juvenile crayfish. Collection and analysis of samples would be expensive and interpretations around the significance of the data would be highly speculative at best. Alternatives to juvenile crayfish could be considered in terms of a bioaccumulation study, as there is at least some overseas marine data for flounder, mussels (*Mytilus*) and eels (*Anguilla*). However that too would at best provide only broadly comparative data which would be of uncertain relevance to the discharge from the upper log yard (and the other port log yards).

As outlined above EPL are required to monitor a variety of water chemistry parameters in situ (and which includes resin acid constituents), as well as test marine sediments for resin acids. This work along with required WET testing, in our view will provide more than sufficient information of the toxicity risk associated with resin acids in the discharge of stormwater from the upper log yard.

Possible Alternative Condition

Although we are proposing deleting altogether Condition 33 we have 'flagged' above the possibility of some alternative form of bioaccumulation study being undertaken if the WET test results reveal any potential adverse effects. Also with time scientific knowledge on the subject both overseas and here may improve and the matter could be 'revisited' in the future. On this basis we have drafted up the following alternative consent condition that could be considered by the by the Council:

27. The consent holder shall within 6 months of completion of the WET testing required under Condition 32 submit to the Council a report on the possible need for an investigation of resin acid levels in crayfish flesh or a similar bioaccumulation study of other species, in relation to the effects of the stormwater discharge from the upper logyard.

9. Condition 34 - Testing for Resins Acids in Seabed Sediments

Condition 34 requires an investigation of log yard runoff contaminants in the inner harbour sediments and comparison of this data with a control site. We are proposing a few changes to the second paragraph of the condition prescribes the nature of the investigations as set out and explained below.

34. "*The consent holder shall undertake….*

The design of the investigation ……

The investigation shall include but not be limited to:

- *Sampling* ***~~a minimum of six~~ three*** *replicate samples from harbour sediments from the Inner Harbour from a site about 20-30m from the stream confluence with the Harbour* ***and which may be composited for analysis****, and from a* ***~~control~~ representative sample composited from three*** *site****s*** *in the Outer Harbour* ***and from a control site in the Turanganui River.***

- *Analysing….*
- *Reporting…..*

A report….

The first change involves the number of samples and compositing. The intent of the sampling is to get a representative picture of the concentrations of contaminants in the vicinity of the discharge relative to the control site. Three replicate sediment subsamples from near the outlet to the harbour and which are composited for analytical purposes is adequate to assess the sediment quality at that location. Given that the site is within a working marina close to the outlet to the Kopuawhakapata Stream and not a natural habitat, the concentrations of the specified compounds are unlikely to be interpretable within the context of ecological risk. This is illustrated further by the absence of NZ reference sediment guidelines for some of the target parameters (total resin acids and dehydroabietic acid).

The second change involves specifying now where the 'control' site is (in the adjacent Turanganui River) and making provision for another representative sample from sites in the adjacent outer harbour, probably in vessel turning basin. This will provide a more representative picture of contaminant gradients within the wider area.

We consider the Turanganui River to be the most appropriate 'control site' from which to understand and interpret the significance of the inner harbour results. It is important that a 'control' site is from a similar type of physical environment with sediments of similar grain size character and similar freshwater inflows, but which are free from log storage area discharges. We expect that the sediment sampling would be coordinated with that currently being undertaken as part of the EPL maintenance dredging monitoring programme in the outer harbour.

10. Additional Monitoring Programme Review Condition

The stormwater discharge permit has a 35 year term and monitoring is required for its entire duration. However we note that there is no explicit provision for EPL to seek changes to the programme, other than through a Section 127 application. We see limitations in the approach because as noted earlier a number of the parameters required to be monitored are similar and have little or no 'trigger' or 'guideline' values associated with them. Also some of them are referenced to plans, standards and other publications that are regularly reviewed and provision should be made for this to be simply reflected in the monitoring programme.

As outlined earlier we have some concerns about the number of parameters being monitored. The AEE that we are currently preparing for the impending discharge permit application for the upgraded Wharfside logyard is expected to include a more discrete monitoring programme.

For the Upper logyard we propose a condition along the following lines:

X The consent holder may as part of any sediment or water quality monitoring report submitted to the Council request changes to the nature of the testing, analysis and reporting to the Council, including discontinuing the monitoring of some parameters, where the concentrations have over four or more occasions been consistently below the 'trigger value' or 'indicator range' set out in the consent conditions. The consent holder may also as part of any sediment or water quality monitoring report submitted to the Council request changes to any 'trigger value' or 'indicator range' that is referenced to a plan, standard or guideline in a consent condition and has been subsequently revised or replaced.

11. Section 127 Considerations

Section 127(1) enables EPL to apply to change one of more of the coastal permit conditions. Section 127(3) notes that the general provisions on making resource consent applications, further information requests, notification and decisions apply to change in consent condition applications, with two 'provisos'. Firstly under Section 127(3)(a) all such applications fall for consideration as discretionary activities. Secondly under Section 127(3)(b) the Council's consideration of the application is confined to 'the effects of the changes'. The effects assessment that follows has been undertaken on this 'comparative' conditions basis and as such is relatively brief.

Section 127(1) requires that any application to change consent conditions be subject the same notification 'tests' as the original application. Section 127(4) further requires that in determining who may be 'affected' particular consideration be given to all parties who made submissions on the original application.

We note from the Council staff report that the stormwater discharge permit under consideration, along with the other consents sought by EPL were publicly notified. This same report states there were eight 'supporting' submissions and twenty three 'opposing' submissions. The effects on these parties of the application to change some of the consent conditions are covered later in this letter.

12. Section 104 Considerations

Section 104 of the RMA establishes the statutory framework within which all applications are to be considered, including those involving changes to consent conditions. First and foremost they are 'subject to' the purpose and principles in Part 2 (Sections 5-8). Secondly, they have to be considered 'having regard to' nine matters listed in subsection 1.
Of the nine matters listed, five are considered relevant to the applications, these being:

- the actual or potential environmental effects of the activities;
- the objectives, policies, rules and other provisions of the relevant Council RMA based plans, in this case the Regional Discharges Plan (RDP) and the Regional Coastal Environment Plan (RCEP);
- Regional Policy Statement;
- National Policy Statement for Freshwater Management; and
- NZ Coastal Policy Statement;

These five matters are assessed below. There are under Section 104, no national environmental standards, regulations, or 'other matters', considered to be of relevance to the application.

13. Assessment of Environmental Effects

The proposed changes to the consent conditions simply relate to the contents of the stormwater discharge monitoring programme as they relate to water and sediment quality and biota. As noted earlier no changes 'on the ground' to the current development of the logyard, or its future operations are proposed.

Most of the changes to the monitoring conditions are simply intended to make them easier to understand and administer, rather than any significant lessening of the monitoring requirements. The proposal to delete the resin acids crayfish flesh survey is the notable exception. However it has been made after a comprehensive review of all the relevant Council hearing and decision making material, published research and discussions with all of the recognised independent testing laboratories in NZ. The monitoring of resin acids levels in the sediments within the port will provide valuable information and EPL are willing to further investigate any effects on crayfish in the future as part of a monitoring programme review condition.

We see the proposed sediment and water quality monitoring programme review condition outlined earlier as being important in this regard. As noted earlier some of the parameters to be monitored have very little if any national or regional standard or guideline or other recognised scientific context. Any individual sampling round non-compliances need to reviewed in the light. In this regard we are currently assisting EPL with a company-wide Environmental Management Plan that looks at its current monitoring responsibilities and how these relate to national and regional plans, standards and guidelines. Preliminary investigations indicate there a few matters that warrant discussion with Council staff and the wider port community.

One of these matters is the relative paucity of national and regional/district environmental standards and guidelines in some key areas and reliance on individual consent hearings to determine them. Such 'one-off' hearings often involve interested parties requesting various water quality and other parameters be monitored by the applicant, but without recognising the limited 'science' surrounding around some of them and the costs involved. Also for much of the coastal marine area and some of the waterways adjacent to the port, including the stream here, have limited Council background 'state of environment' monitoring data. We understand the Council is addressing this matter and also progressing with reviews of some of the key planning documents, like the draft Freshwater Regional Plan. This work will assist EPL and the wider community in the future.

The extent of the monitoring required and consistency across activity areas, notably logyards, is another matter we have identified in the company wide EMP work. We note that the consents issued for the Southern and Matawhero logyards in 2010 required seven and eight water quality parameters respectively be monitored, whereas the consents issued for the Upper logyard in 2011 involved sixteen such parameters, plus sediment quality testing, WET testing and a crayfish flesh survey.

The changes to the consent conditions are being proposed with the expectation that the applicable guideline 'trigger' values will be met. Also with a clearer set of consent conditions, along with number of Standard Operating Procedures in place and the regular training of EPL and contracting staff we expect that any non-compliant test results will readily explainable and any necessary corrective actions able to be carried out promptly. In summary we consider the environmental effects of the proposed changes to the consent conditions to be 'less than minor'.

14. Regional Discharges Plan Considerations

Relevant Rule

We note from the Council decision and the officers report that the stormwater discharge to the stream was required under Rule 6.5.3 of the Regional Discharges Plan and it was assessed accordingly as discretionary activity. We are not aware of any plan changes subsequent to the granting of the consent that this rule or others that relate to the site. As such Rule 6.5.3 is the principal reference point again.

Rule 6.5.3 effectively deems all point source liquid discharges to land or water, in except those listed as permitted or prohibited activities in other parts of the plan, to be discretionary activities. The Chapter 6 rules only provide for two forms of liquid discharges as permitted activities; these being any emergency overflows of untreated sewage from reticulated systems and seawater from lobster holding tanks (Ref Rule 6.5.1). Point source discharges of untreated agricultural effluent or untreated sewage are prohibited activities under Rule 6.5.4.

Rule 6.5.3 does not contain any particular assessment criteria for liquid discharge permit applications of a discretionary activity nature. The explanatory note attached to the rule states that they will be assessed against the RMA and the regional plan objectives and policies.

Relevant Objectives & Policies

Chapter 6 – Liquid Discharges, has three objectives and eight policies. All are applicable to the authorised discharge and S127 application.

The objectives are directed at avoiding, remedying or mitigating adverse effects of discharges on water bodies, in this case the Kopuawhakapata Stream, and associated 'environmental quality' and 'human health' concerns. As outlined earlier the S127 application is not seeking any changes to the method of stormwater treatment so as such the discharges from the yard (as approved) will achieve these objectives.

The S127 application is also consistent with the underlying policies that focus on 'ecosystem health' (including breeding and feeding sites) 'amenity values' and other matters. Policy 8 highlights the Councils ability to require 'Discharge Management Plans' through consent conditions. As outlined earlier a site specific 'Environmental Management Plan' is required under the current consent conditions and a draft plan was submitted to the Council in January this year. It was during the preparation of this plan that the shortcomings in some of the related consent conditions on monitoring were identified.

15. Regional Coastal Environment Plan Considerations

The provisions of the Proposed Regional Coastal Environment Plan (Coastal Plan) are relevant only in so far as conditions requiring WET testing of selected marine species and a survey of any resin acids in crayfish flesh relate to the CMA and indirectly to this plan. A review the Council decision and associated staff and consultant reports do not indicate that provisions of this plan were instrumental in any way in leading to these conditions. As such only limited consideration is given to plan.

The Port area has "Port Management Area" zoning in the Coastal Plan. The Port MA has a set of rules, which control activities along with a related set of guiding objectives and policies.

Rule 4.4.7E provides for "*the discharge of stormwater and uncontaminated seawater to the coastal marine area*" as a permitted activity provided three conditions are met.

They are:

(a) The activity shall not cause any permanent:
(i) Reduction of the ability of the receiving channel to convey flood flows;
(ii) Scouring of the foreshore or seabed as a consequence of the discharge.
(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;
(c) The water classification standards for Poverty Bay set out in Chapter 3.4 and Appendix 7 are met.

We understand that the original application was made on the basis that the part of clause (b) regarding 'conspicuous suspended material' was unlikely to be met. As such the application fell for consideration as 'discharges not more specifically addressed elsewhere in the plan' under Rule 4.43.7D.

We are not are of any Council changes to the plan rules relating to stormwater discharges, since the original application was processed in 2010/2011. Likewise we are not aware of any changes to the plan objectives and policies.

The most pertinent plan objectives and policies are in Chapter 3 – Activities, and in particular Section 3.4 - Contaminant Discharges. This section contains background information relating to discharges generally, the water classification system and standards mentioned earlier. It notes several issues surrounding the discharge of sewage from the Council's wastewater treatment plant into Poverty Bay. The plan makes no references to discharges from port operations, including stormwater discharges from logyard operations.

The three objectives and sixteen policies are also mainly of a general nature, although some relate solely to the city's wastewater discharge. Policy 3.3.4N covers discharges from vessels, with part (b) applying to the Port MA. This application does not relate to discharges from vessels and as such is not relevant.

Some of the objectives and policies in Chapter 4 – Management Process are relevant to the application. Section 4.4 –Port Management Area contains five objectives and three policies. The objectives, other than B on 'avoiding adverse effects' are of limited relevance to the proposal. They are directed at how the plan provisions have been formulated and may be changed in the future. The policies are likewise more directed at the plan preparation and review process. Policy A on the 'need and operational necessity of port activities' is relevant to the application and met.

16. Gisborne Regional Policy Statement Considerations

The Regional Policy Statement (RPS) is operative and there have been two proposed changes. Proposed Change 2 relating to the Transpower electricity network, which has been placed 'on hold', is not relevant to the proposal.

The RPS has ten chapters and six appendices. Chapter 6 – Coastal Management is most relevant to the application. It has three sets of objectives, policies and methods, along with cross references to wider ranging provisions in other chapters that apply to a variety of different environments. The three 'primary' sets of objectives policies and methods relate to the following matters:

- Effects of Activities That Straddle Boundaries
- Effects of Activities That May Destroy or Damage Coastal Natural Character
- Effects of Activities that May Inhibit Natural Processes or Degrade Natural Features

The last matter is of most relevance. The changes proposed to the consent conditions relating to the monitoring of the stormwater discharge will ensure that it and the other provisions are met. As outlined earlier no changes are proposed to the methods of stormwater collection, treatment and discharge so the actual treated stormwater discharge will not inhibit natural processes or degrade natural features.

17. National Freshwater Policy Statement Considerations

The NPS –Freshwater 2014 was not in place when the upper logyard consents were being processed by the Council. It has seven sections and four appendices, along with other introductory material. Section A - Water Quality, is most really applicable to the application. Section B - Water Quantity, is indirectly of some relevance.

The two objectives on water quality in Section A are similar to those in the RMA, the RPS and RDP. They are directed at safeguarding life supporting capacity, ecosystem processes, and indigenous species, along with the health of people and communities as affected by secondary contact. The four underlying policies are primarily directed at Council's and their regional plan provisions, which as outlined earlier have taken into account in making this application.

The four objectives on water quantity in Section B are also similarly based to those in the RMA and related instruments, like the RPS and RDP. They are directed at safeguarding life supporting capacity, avoiding over allocation, efficient use and protecting significant in steam and wetland values. The seven underlying policies are also primarily directed at Council's and their regional plan provisions. They have given due regard to in making the application.

18. NZ Coastal Policy Statement Considerations

The NZCPS has a number of objectives policies, along with a schedule and glossary. Policy 23: Discharge of Contaminants is most pertinent to the application. Policy 9: Ports is also relevant.

Policy 23 has five parts, two of which relate to discharges of human sewage and are not relevant. Part 1 (a) deals with effects on the receiving environment with (e) requiring "*use the smallest possible mixing zone required to achieve the required water quality…*" and (f) requiring "*minimise effects on the life supporting capacity of water within a mixing zone.*" Both of these provisions have been taken into account in the 'mixing zone' parts of the proposed conditions and are explained further in the January 2015 draft EMP submitted to the Council.

Part 4 on 'managing stormwater discharges' is also considered to be met. The draft EMP outlines in detail how the logyard is managed on a day to day basis, including regular inspection and maintenance of the yard and associated stormwater collection and treatment facilities.

19. Part 2 Matters

The purpose of the Act as stated in Section 5 is 'to promote the sustainable management of natural and physical resources'. Section 6 lists seven matters of national importance to be recognised and provided for in relation to the Act's purpose. Clause (a) set out below is of some relevance. It requires:

"(a) The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use and development;"

The proposed changes to the discharge permit conditions are 'appropriate' for the reasons outlined in Section 8 of this letter. As such this requirement is met.

Section 7 identifies eleven matters that all parties are to have 'particular regard to'. The following are relevant to the application:

(a) Kaitiakitanga;
(aa) The ethic of stewardship;
(b) The efficient use and development of natural and physical resources;
(c) The maintenance and enhancement of amenity values;
(d) Intrinsic values of ecosystems;
(f) Maintenance and enhancement of the quality of the environment;
(g) Any finite characteristics of natural and physical resources;
(i) The effects of climate change;

Clause (e) has been repealed, whilst Clauses (ba) and (j) relating to energy use are of limited, if any, relevance.

The Section 8 requires decision-makers to take into account the principles of the Treaty of Waitangi.

The proposed changes to the consent conditions do not alter the original finding that the grant of consent is in accordance with Part 2 of the Act.

20. Notification Considerations

The Resource Management (Simplifying and Streamlining) Amendment Act of October 2009 substantially amended the notification provisions for resource consent applications. There is no longer a presumption that Council's should publicly notify resource consent applications. Instead the Act gives

Councils a general power to publicly notify an application (Section 95A (1)) and also prescribes the circumstances when an application is required to be notified (Section 95A (2)).

The Section 95A (2) provisions that require an application to be publicly notified are if:

(a) the activity will have, or is likely to have, adverse effects on the environment that are more than minor;
(b) the applicant requests public notification of the application; or
(c) a rule or national environment standard requires public notification.

In terms of Clause (a) Section 8 of this letter concluded that the environmental effects of the proposed condition changes will be 'less than minor'. In terms of Clause (b) EPL are not requesting public notification of the application. In terms of Clause (c) we are not aware of any regional plan rule (or national environmental standard) that requires public notification of the application. As such we consider that the application meets the requirement in Section 95A (2) and should not be publicly notified.

Section 95A (4) enables a Council to publicly notify any application if 'special circumstances' are considered to exist. We are not aware of any 'special circumstances' that would give rise to public notification of this application, which simply involves changes to consent conditions relating to the monitoring programme for a stormwater discharge.

Under Sections 95B and 95E (1) if an application is not publicly notified, the Council must decide if the owners and occupiers of 'the site and adjacent land' are 'affected' in a 'minor or more than minor' manner and if so undertake limited notification of those persons. Under Section 95E (2) the Council is required, or able to, disregard certain matters. They are similar to those outlined above in respect of the public notification decision. Under Section 95E (3) the Council must also disregard the effects on a party that has provided a written approval or it is unreasonable in the circumstances to require such an approval.

As outlined earlier the stormwater discharge is into the Kopuawhakapata Stream. Annexure E contains a Quickmap plan of the stream. We understand that the stream is not navigable and runs through several private properties. The term 'adjacent land' is not defined in the RMA. However it is generally interpreted to mean land that either adjoins the site or is in the immediate vicinity of it. The 'site' and 'adjacent land' with this application are considered to be the properties identified on the Annexure E plan.

Section 13 of this letter concluded that the environmental effects of the proposed changes to the consent conditions will be 'less than minor'. As such we do not consider that the property owners and occupiers adjacent to the stream are adversely affected.

Table 3 of the Council staff report contains a detailed summary of the submissions. We have used this table as the basis for undertaking the Section 127(4) consideration of whether any of the submitters may be 'adversely affected' by the proposed changes to the consent conditions. Our consideration of this matter is limited to those parties (23) who made opposing submissions, either in whole or part.

Table 3 indicates that the following submitters raised concerns with the stormwater discharge to the stream and related effects, and/or coastal and stream water quality generally:

- D Hamilton (No. 1)
- Ngati Porou Seafoods Ltd (2)
- NZ Recreational Fishing Council (14)
- Rongowhakaata Iwi Trust (16)
- NZ Rock Lobster Industry Council (17)
- Te Whanau a Kai Trust (20)

- Te Ohu Kaimoana (21)
- Te Aitanga a Mahaki Trust (22)
- National Rock Lobster Management Group (23)
- B Te Pairi (24)
- Tairawhiti Rock Lobster Industry Association (25)
- Tairawhiti District Health Board - B Duncan (26)

We have reviewed the submissions from the above parties and note there are very few references to the detailed contents and form of a stormwater monitoring programme. From the available records we have not be able to ascertain whether any of the above submitters presented any technical evidence on this same matter. As such it is not possible to fully determine if they are 'adversely affected' or not. We could advise further on this matter if the Council supplied us with a copy of the hearing evidence.

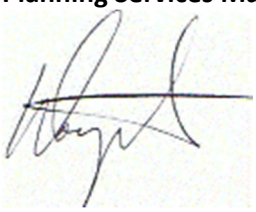
We suspect from reading the hearing related material, including the Council decision, that the monitoring consent conditions under consideration here were largely, if not exclusively, developed by EPL consultants, Council advisors and the Hearing Committee. As such we are of the view that probably none of the opposing submitters will be adversely affected by the proposed changes to the monitoring conditions. However we recognise this is a 'grey' area and recognise that the Council may want to limit notify the submitters (12 in total) identified above.

In reviewing the submissions we did note some of them referred to the port as a 'crayfish nursery', with one actually stating that 'Turanganui a Kiwa harbour is undisputedly New Zealand's largest crayfish nursery'. As outlined in a recent letter to the Council in respect of the continued port maintenance dredging operations we are not aware of any independent scientific study that supports the 'port crayfish nursery' claim, including that it is the undisputedly the country's largest. If the Council has any reports that support the claim we would like to review them. We have discussed this matter with some of the abovementioned parties and if any new information comes to hand we will advise the Council accordingly.

We trust that the above explanation and assessment, along with the attachments, cover everything. If you have any queries do not hesitate to contact us or Marty Bayley.

Yours sincerely

Max Dunn
Planning Services Manager



Mark Poynter
Principal Ecologist

<u>Attachments</u>

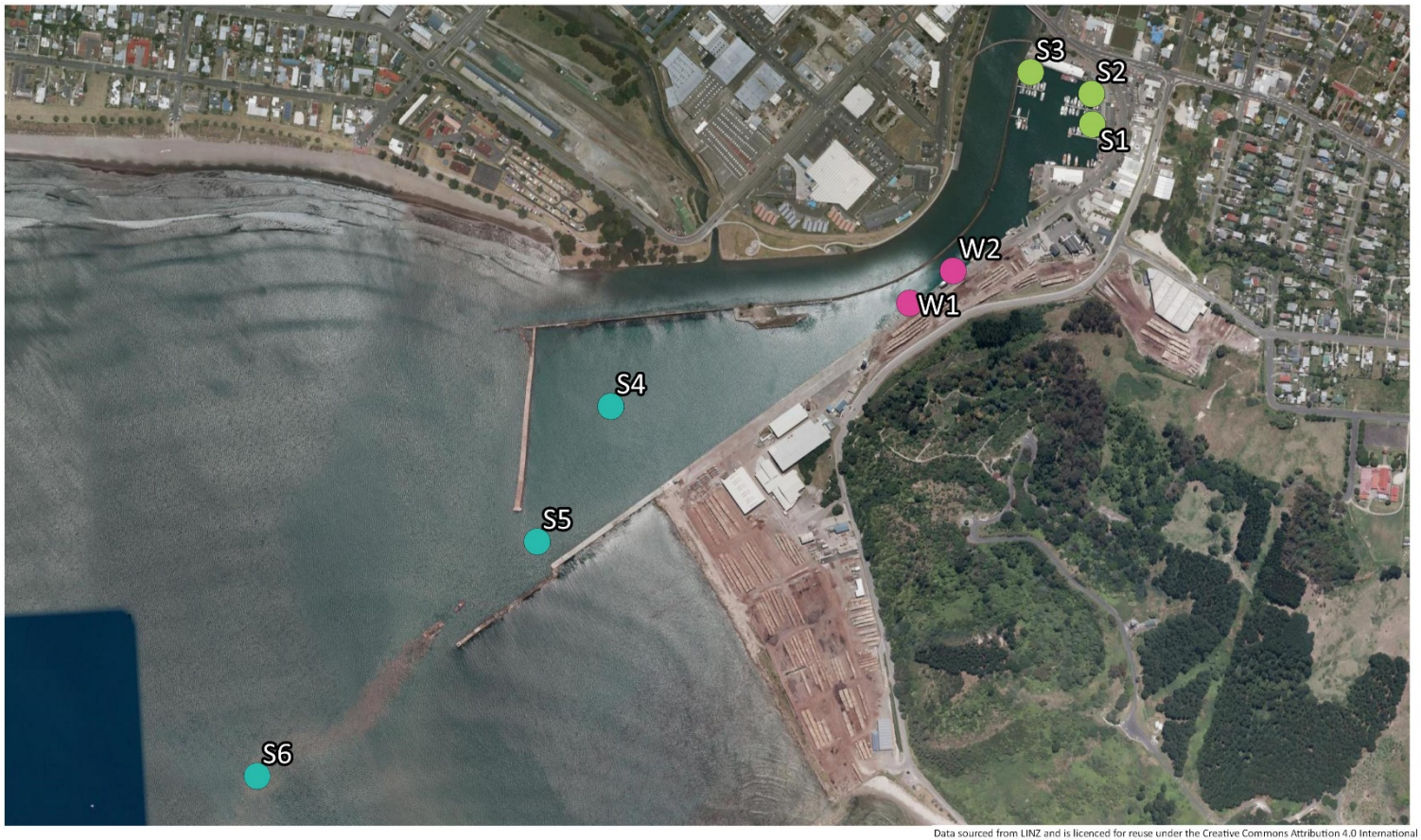
Annexure A – S127 application form
Annexure B - Existing resource consents, including decision
Annexure C – Plan of Monitoring Sites
Annexure D – ASL S127 application letter on BOD, COD and TOC for southern logyard permits
Annexure E – Quickmap plan of site and adjacent land

Copies – by email

Marty Bayley - Eastland Port Ltd

Appendix B:

Sampling Sites



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AA1146 — EPL Outsourced Comliance Programme

Eastland Port Sediment Sampling Sites

Prepared for Eastland Port Ltd by 4Sight Consulting

- Maintenance Dredging
- Upper Logyard
- Wharfside Monitoring

Date: 28/05/2021
Version: 1.0
Author: MK
Checked: MP
Approved: MP

Appendix C:

Chain of Custody Forms

4SIGHT CONSULTING

Hill Laboratories
TRIED, TESTED AND TRUSTED

ANALYSIS REQUEST

R J Hill Laboratories Limited
28 Duke Street Frankton 3204
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

Office use only (Job No)

Quote No 110288

Primary Contact Mark Poynter 219137

Submitted By Mark Poynter 219137

Client Name 4SIGHT Consulting Limited 219138

Address PO Box 402053, Tutukaka 0153

Phone *Mobile*

Email

Charge To 4SIGHT Consulting Limited 95478

Client Reference AA1146 - ULY

Order No 1146-ULY

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

☐ *Email Primary Contact* ☐ *Email Submitter* ☐ *Email Client*
☐ *Email Other* _____
☐ *Other* _____

Dates of testing are not routinely included in the Certificates of Analysis. Please inform the laboratory if you would like this information reported.

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories *Date & Time:*
☐ *Tick if you require COC to be emailed back* *Name:*
Signature:

Received at Hill Laboratories *Date & Time:*
Name:
Signature:

Condition ☐ *Room Temp* ☐ *Chilled* ☐ *Frozen* *Temp:*

☐ Sample & Analysis details checked
Signature:

ADDITIONAL INFORMATION / KNOWN HAZARDS

Priority ☐ **Low** ☐ **Normal** ☑ **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)

No.	Sample Name	Sample Date/Time	Sample Type	Tests Required
1	ULY1		Sed	Ash, MSHMHgt, TPHOl, TN, TOC, AgRt, SVOCt
2	ULY2		Sed	Ash, MSHMHgt, TPHOl, TN, TOC, AgRt, SVOCt
3	ULY3		Sed	Ash, MSHMHgt, TPHOl, TN, TOC, AgRt, SVOCt
4	ULY4		Sed	Ash, MSHMHgt, TPHOl, TN, TOC, AgRt, SVOCt
5				
6				
7				
8				
9				
10				

Appendix D:

Laboratory Analysis Forms

Hill Laboratories
TRIED, TESTED AND TRUSTED
R J Hill Laboratories Limited
28 Duke Street Frankton 3204
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

Certificate of Analysis

Client:	4SIGHT Consulting Limited	**Lab No:**	2559843	SPv1
Contact:	Mark Poynter	**Date Received:**	18-Mar-2021	
	C/- 4SIGHT Consulting Limited	**Date Reported:**	29-Mar-2021	
	PO Box 402053	**Quote No:**	110288	
	Tutukaka 0153	**Order No:**	1146-ULY	
		Client Reference:	AA1146 - ULY	
		Submitted By:	Mark Poynter	

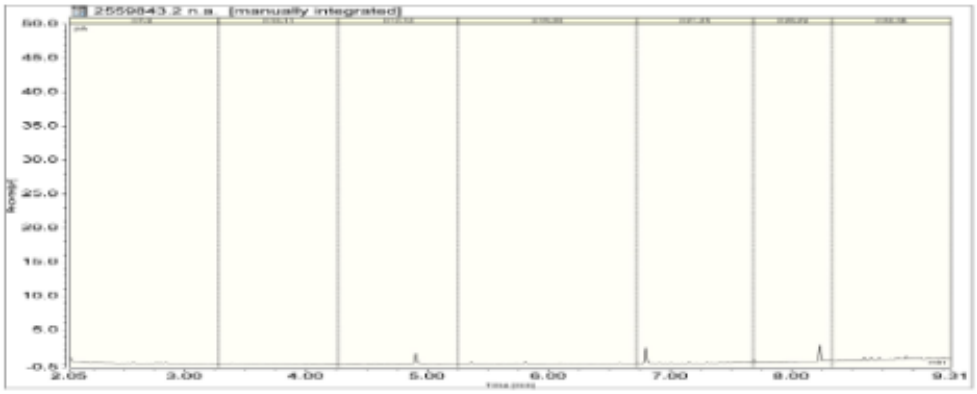
Sample Type: Sediment

Sample Name:		ULY1 16-Mar-2021	ULY2 16-Mar-2021	ULY3 16-Mar-2021	ULY4 16-Mar-2021	
Lab Number:		2559843.1	2559843.2	2559843.3	2559843.4	
Individual Tests						
Dry Matter	g/100g as rcvd	44	43	50	48	-
Ash*	g/100g dry wt	92	90	93	93	-
Total Recoverable Silver	mg/kg dry wt	0.07	0.07	0.05	0.06	-
Total Nitrogen*	g/100g dry wt	0.14	0.20	< 0.13	< 0.13	-
Total Organic Carbon*	g/100g dry wt	1.64	3.4	1.35	0.98	-
Heavy metals, trace As,Cd,Cr,Cu,Ni,Pb,Zn,Hg						
Total Recoverable Arsenic	mg/kg dry wt	8.9	8.8	7.1	6.6	-
Total Recoverable Cadmium	mg/kg dry wt	0.188	0.173	0.051	0.068	-
Total Recoverable Chromium	mg/kg dry wt	21	18.8	18.0	15.6	-
Total Recoverable Copper	mg/kg dry wt	42	46	29	17.5	-
Total Recoverable Lead	mg/kg dry wt	18.9	35	12.2	9.2	-
Total Recoverable Mercury	mg/kg dry wt	0.08	0.07	0.06	0.05	-
Total Recoverable Nickel	mg/kg dry wt	18.9	18.3	15.9	17.4	-
Total Recoverable Zinc	mg/kg dry wt	143	250	92	67	-
Haloethers Trace in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Bis(2-chloroethyl)ether	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Bis(2-chloroisopropyl)ether	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
4-Bromophenyl phenyl ether	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
4-Chlorophenyl phenyl ether	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Nitrogen containing compounds Trace in SVOC Soil Samples, GC-MS						
N-Nitrosodiphenylamine + Diphenylamine	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
2,4-Dinitrotoluene	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
2,6-Dinitrotoluene	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Nitrobenzene	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
N-Nitrosodi-n-propylamine	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Organochlorine Pesticides Trace in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
alpha-BHC	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
beta-BHC	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
delta-BHC	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
4,4'-DDD	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
4,4'-DDE	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
4,4'-DDT	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Dieldrin	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Endosulfan I	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-

Sample Type: Sediment						
Sample Name:		ULY1 16-Mar-2021	ULY2 16-Mar-2021	ULY3 16-Mar-2021	ULY4 16-Mar-2021	
Lab Number:		2559843.1	2559843.2	2559843.3	2559843.4	
Organochlorine Pesticides Trace in SVOC Soil Samples by GC-MS						
Endosulfan II	mg/kg dry wt	< 0.5	< 0.5	< 0.5	< 0.5	-
Endosulfan sulphate	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Endrin	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Endrin ketone	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Heptachlor	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Heptachlor epoxide	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Hexachlorobenzene	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Polycyclic Aromatic Hydrocarbons Trace in SVOC Soil Samples*						
Acenaphthene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Acenaphthylene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Anthracene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Benzo[a]anthracene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
1&2-Chloronaphthalene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Chrysene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Fluoranthene	mg/kg dry wt	< 0.10	0.14	< 0.10	< 0.10	-
Fluorene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
2-Methylnaphthalene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Naphthalene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Phenanthrene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Pyrene	mg/kg dry wt	0.11	0.17	< 0.10	< 0.10	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Phenols Trace in SVOC Soil Samples by GC-MS						
4-Chloro-3-methylphenol	mg/kg dry wt	< 0.5	< 0.5	< 0.5	< 0.5	-
2-Chlorophenol	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
2,4-Dichlorophenol	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
2,4-Dimethylphenol	mg/kg dry wt	< 0.4	< 0.4	< 0.4	< 0.4	-
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	< 0.4	< 0.4	< 0.4	< 0.4	-
2-Methylphenol (o-Cresol)	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
2-Nitrophenol	mg/kg dry wt	< 0.4	< 0.4	< 0.4	< 0.4	-
Pentachlorophenol (PCP)	mg/kg dry wt	< 6	< 6	< 6	< 6	-
Phenol	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
2,4,5-Trichlorophenol	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
2,4,6-Trichlorophenol	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Plasticisers Trace in SVOC Soil Samples by GC-MS						
Bis(2-ethylhexyl)phthalate	mg/kg dry wt	0.7	1.1	< 0.5	< 0.5	-
Butylbenzylphthalate	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Di(2-ethylhexyl)adipate	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
Diethylphthalate	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Dimethylphthalate	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Di-n-butylphthalate	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Di-n-octylphthalate	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Other Halogenated compounds Trace in SVOC Soil Samples by GC-MS						
1,2-Dichlorobenzene	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
1,3-Dichlorobenzene	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
1,4-Dichlorobenzene	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-

Sample Type: Sediment						
Sample Name:		ULY1 16-Mar-2021	ULY2 16-Mar-2021	ULY3 16-Mar-2021	ULY4 16-Mar-2021	
Lab Number:		2559843.1	2559843.2	2559843.3	2559843.4	
Other Halogenated compounds Trace in SVOC Soil Samples by GC-MS						
Hexachlorobutadiene	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Hexachloroethane	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Other SVOC Trace in SVOC Soil Samples by GC-MS						
Benzyl alcohol	mg/kg dry wt	< 1.3	< 1.3	< 1.1	< 1.2	-
Carbazole	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Dibenzofuran	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Isophorone	mg/kg dry wt	< 0.13	< 0.13	< 0.11	< 0.12	-
Total Petroleum Hydrocarbons in Solids						
C7 - C9	mg/kg dry wt	< 14	< 14	< 12	< 12	-
C10 - C14	mg/kg dry wt	< 30	< 30	< 30	< 30	-
C15 - C36	mg/kg dry wt	< 60	134	< 50	< 50	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 100	136	< 90	< 90	-

2559843.2
ULY2 16-Mar-2021
Client Chromatogram for TPH by FID



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 simple 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. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Sediment			
Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-4
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%.	-	1-4
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-4
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1-4
Ash*	Ignition in muffle furnace 550°C, 6hr, gravimetric. APHA 2540 G 23rd ed. 2017.	0.04 g/100g dry wt	1-4
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	1-4

Sample Type: Sediment			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Total Nitrogen*	Catalytic Combustion (900°C, O2), separation, Thermal Conductivity Detector [Elementar Analyser].	0.05 g/100g dry wt	1-4
Total Organic Carbon*	Acid pretreatment to remove carbonates present followed by Catalytic Combustion (900°C, O2), separation, Thermal Conductivity Detector [Elementar Analyser].	0.05 g/100g dry wt	1-4
Heavy metals, trace As,Cd,Cr,Cu,Ni,Pb,Zn,Hg	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, trace level.	0.010 - 0.8 mg/kg dry wt	1-4
Semivolatile Organic Compounds Trace in Soil by GC-MS	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.002 - 6 mg/kg dry wt	1-4
Total Petroleum Hydrocarbons in Solids			
Client Chromatogram for TPH by FID	Small peaks associated with QC compounds may be visible in chromatograms with low TPH concentrations. QC peaks are as follows: one peak in the C12 - 14 band, the C21 - 25 band and the C30 - 36 band. All QC peaks are corrected for in the reported TPH concentrations.	-	2
C7 - C9	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	8 mg/kg dry wt	1-4
C10 - C14	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	1-4
C15 - C36	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	40 mg/kg dry wt	1-4
Total hydrocarbons (C7 - C36)	Calculation: Sum of carbon bands from C7 to C36. In-house based on US EPA 8015.	70 mg/kg dry wt	1-4

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

Testing was completed between 19-Mar-2021 and 29-Mar-2021. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

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

Te Papa Tipu Innovation Park,
49 Sala Street, Rotorua
Private Bag 3020, Rotorua 3046,
New Zealand

Telephone +64 7 343 5899
Facsimile +64 7 348 0952
Email enquiries@scionresearch.com
www.scionresearch.com

Thursday, 29 April 2021

4Sight Consulting on behalf of Eastland Port Ltd.
Office 1, Shop 10
Oceans Resort Hotel
Marina Road
Tutukaka
Attn: Mark Poynter

TRACE RESIN ACID ANALYSIS (INCLUDING DHAA) OF SIX MARINE SEDIMENTS (ULY 1-4 and W 1-2) 16 March 2021.

CLIENT'S ORDER NUMBER:	AA 1146 – ULY Dredging.
WORK PERFORMED BY:	Murray Robinson and Michael Robertson.
WORK CHECKED BY:	Kim McGrouther
APPROVED BY:	**(SIGN)**
DATE OF ISSUE:	29 April 2021
DISTRIBUTION:	**CLIENT:** 1 copy **SCION Files:** 1 copy

SCION
Private Bag 3020
ROTORUA:
Fax (07) 343 5507 Phone (07) 343-5899 Email: murray.robinson@scionresearch.com

DATE SAMPLES RECEIVED	18/03/2021
SAMPLE DESCRIPTION	Six samples in 1L glass bottles (450°C muffled bottles supplied by Scion) – samples sent by Mark Poynter (4Sight Consulting).
SAMPLE IDENTIFICATION	ULY 1, 16/03/2021 Grey sediment. ULY 2, 16/03/2021 Dark grey sediment. ULY 3, 16/03/2021 Grey sediment. ULY 4, 16/03/2021 Grey sediment. W 1, 16/03/2021 Grey sediment. W 2, 16/30/2021 Grey sediment.

SAMPLING PROCEDURE

This report relates only to the items tested as received and therefore does not necessarily represent the sample from which it was taken.

DATE OF TESTING 23/03/2021

METHODS

In-house method, involving freeze-drying, soxhlet extraction with hexane/isopropanol, followed by gas chromatography - mass spectrometry (GC/MS) analysis.

RESULTS:

RESIN ACIDS (µg/g d.w.)

Sample name	ULY1 16/03/21	ULY2 16/03/21	ULY3 16/03/21	ULY4 16/03/21	W1 16/03/21	W2 16/03/21
Pimaric acid	n.d.	0.2	n.d.	n.d.	n.d.	n.d.
Sandaracopimaric acid	n.d.	1.3	n.d.	n.d.	n.d.	n.d.
Isopimaric acid	n.d.	0.1	n.d.	n.d.	n.d.	n.d.
Palustric acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Levopimaric Acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Dehydroabietic acid	0.4	1.6	0.2	0.2	0.2	0.2
Abietic acid	n.d.	0.3	n.d.	n.d.	n.d.	n.d.
Neoabietic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Pimarenic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sandaracopimarenic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Isopimarenic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
13-Abietenic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Pimaranic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Isopimaranic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Abietanic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Seco-1-dehydroabietic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Seco-2-dehydroabietic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
12-Chlorodehydroabietic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
14-Chlorodehydroabietic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
12,14-Dichlorodehydroabietic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
7-Oxodehydroabietic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Total Resin Acids	**0.4**	**3.5**	**0.2**	**0.2**	**0.2**	**0.2**

n.d. = not detected, method detection limit is 0.1 µg/g d.w. (dry weights measured in duplicate @105°C overnight).
Results presented are from triplicate sample analysis and concentrations are in µg/g d.w. Compounds are quantified if they have a response 2.5 times higher than the average blank.