



Summary document:

Post-remediation contaminant monitoring of sediment and shellfish from estuarine areas adjacent to the former Fruitgrowers Chemical Company (FCC) site, Mapua, Nelson (2025)

Reference:

Davidson, R.J.; Richards, L. A.; T. Scott-Simmonds 2025. Summary document: Post-remediation contaminant monitoring of sediment and shellfish from estuarine areas adjacent to the former Fruitgrowers Chemical Company (FCC) site, Mapua, Nelson (2025). Prepared by Davidson Environmental Ltd. for Tasman District Council. Survey and monitoring report no. 1254.

Prepared by Davidson Environmental Limited for:
Tasman District Council
189 Queen Street
Richmond
Nelson

Samples collected by Rob Davidson, Laura Richards, Tom Scott-Simmonds
Laboratory analysis by Hill Laboratories.

Updated final report 11th September 2025

Specialists in research, survey and monitoring

Contents

Summary	3
1.0 Introduction	5
2.0 Methods.....	5
3.0 Summary of results	6
3.1 Sediment contamination	6
3.1.1 ADL (Aldrin, Dieldrin, Lindane).....	6
3.1.2 DDX.....	6
3.1.3 Comparisons with the previous sample event in 2022	7
3.2 Shellfish and snail contaminant levels	7
4.0 Patterns of contamination	10
4.1 Sediments	10
4.2 Biota	11
5.0 Recommendations	12
References	13
Acknowledgements.....	14
Appendix 1. Sediment sample sites.	15
Appendix 2. Invertebrate sample sites located at impact (FCC) and control sites.....	18
Appendix 3. Sediment raw data 2025.....	19
Appendix 4. Biota data 2025.....	25
Appendix 5. Sediment data 2022.....	27
Appendix 6. Biota data 2022.....	33
Appendix 7. Sediment data 2019.....	35
Appendix 8. Invertebrate data 2019.....	41
Appendix 9. Sediment data 2018.....	44
Appendix 10. Invertebrate data 2018.....	50
Appendix 11. Summary of DDX and ADL data between 2018 and 2022.	52

Specialists in research, survey and monitoring

Summary

The document provides a summary of post-remediation contaminant monitoring of sediment and shellfish from estuarine areas adjacent to the former Fruitgrowers Chemical Company (FCC) site in Mapua, Nelson, for the year 2025.

Marine sediment and selected species adjacent to the former FCC site have been regularly sampled since the completion of the remediation project. Data have been collected 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2018, 2019, and 2022.

Previous sample event (2022)

In 2022, most surface sediment sites did not exceed the Soil Acceptance Criteria (SAC) for ADL, with some minor increases and declines noted compared to 2015. However, deeper sediments at several sites exceeded SAC levels.

DDX levels exceeded SAC at most surface impact sites in 2022, but showed a general decline compared to 2015. Deeper sediment samples also showed a decline in DDX levels at most sites.

Shellfish and Snail Contaminant Levels: ADL and DDX levels in cockles remained low in 2019 and 2022, while mudflat snails showed a decline in ADL levels at West FCC site. Topshell snails showed comparable levels to previous years.

Present sample event (2025)

In 2025, ADL levels were below the SAC at all shallow sample sites but were exceeded at all but three deeper sample sites.

DDX was present at many sites adjacent to the former FCC site, however, levels of contamination at most sites remain stable. The exception was two sites at the East FCC beach where a high DDX reading was recorded by the laboratory. The laboratory reported some sites exhibited prills (DDX granules). These sites were retested by the laboratory.

It is likely the high level of localised contamination now present near the surface at the eastern beach originated from excavations that occurred in 2022.

Human Health Implications: Cockles, the species most likely to be consumed by humans, showed contaminant levels within acceptable health thresholds. Levels consistent with the control site indicate a low risk to health should they be eaten from the area.



Specialists in research, survey and monitoring

Recommendations: It is recommended that western monitoring of contaminants continue every three years due to persistent DDX contamination and variability in sediment and shellfish contaminant levels.

Based on the high result at the East FCC beach where excavations occurred, it is recommended the disturbance area be determined and a plan to collect additional samples from sediments down to 10 cm depth be initiated. It is also recommended that the independent auditor be notified of the findings and comments be sought.

Specialists in research, survey and monitoring

1.0 Introduction

Following the completion of the remediation project at the former Fruitgrowers Chemical Company (FCC) in early 2008, a variety of aspects have been sampled including marine sediments, invertebrate contaminants and algae blooms (Davidson *et al.*, 2010; 2011; 2012; 2016) with samples collected by Tasman District Council (TDC) staff in 2013, 2014 and 2015. Since that time a reduced sampling regime targeting sediments and marine species were also conducted in May 2018, March 2019 and March 2022 (Davidson *et al.*, 2018, 2019; 2022). On each of these latter occasions a summary document was produced for the Tasman District Council (TDC).

The present summary document presents data collected on the 11th May 2025 by Davidson Environmental Limited. Hills laboratory testing data for the present sampling event plus 2018, 2019, 2020 and 2022 samples are presented in Appendices 3-10.

Data includes:

- Contaminant levels in sediments (shallow 0-2 cm, deeper 6-10 cm);
- Contaminant levels in molluscan species (mudflat snail, top-shell snail, cockle).

We note that the East FCC *Amphibola* (mud flat snail) sample could not be collected due to a shortage of snails at this site. The *Diloma* (top shell) and cockle samples were collected at the East FCC site as usual.

2.0 Methods

For details of sample sites and methodologies, refer to the most recent full-scale report produced by Davidson and Sheldon (2016). The same sites, sampling methods, target contaminants and analyses used by Davidson and Sheldon (2016) were adopted during the present sampling event. The location of 2016 sample sites have been included in Appendix 1 and 2 of the present report.

Present data were compared to the 2015 data produced in Davidson and Sheldon (2016). In 2015, the recovery of contaminated sites was well underway and the previous large spike values were no longer occurring.

3.0 Summary of results

3.1 Sediment contamination

A summary of contaminant data collected in 2025 is shown in Tables 1 to 3. Raw data for sediment analyses is included in Appendix 3-10 and a summary of data from 2018 to 2022 is presented in Appendix 11.

3.1.1 ADL (Aldrin, Dieldrin, Lindane)

Surface sediments

ADL (Aldrin, Dieldrin, Lindane) levels from all but one surface western and eastern FCC site located in the estuary and stream were below the SAC (Table 1). The exception was the West FCC stream (middle) site that had an ADL of 0.026 mg/kg.

Deeper sediments

ADL (Aldrin, Dieldrin, Lindane) levels from most deep western and eastern FCC sites located in the estuary and stream were below the SAC (Table 1). The exceptions were the West FCC stream (middle) site that had an ADL of 0.026 mg/kg, and the East FCC sites JME087 and 090 each with 0.0143 and 0.1 mg/kg respectively (Table 2).

3.1.2 DDX

Shallow sediments

The SAC for DDX values were exceeded at most surface FCC sites in 2025, however, contamination levels had declined at all sites apart from the upper western stream site compared to 2015 values (Table 1).

At the stream site, a small increase occurred rising from 0.6 in 2015 to 0.065 mg/kg. in 2025 (Table 1). This increase was likely within the range of environmental variability, suggesting the DDX levels at this site have remained relatively stable since the 2015 sample.

Deep sediments

The SAC for DDX values were exceeded at all deep FCC sample sites in 2025. Two of the seven deep West FCC sediment samples showed a decline in DDX compared to 2015, however, the remainder showed a small increase since 2015 (Table 2).

For the east FCC sites, three of the six sites showed increases since 2015. The largest being a change from 1.3 mg/kg to 93 mg/kg at JME 088 in 2025. The laboratory re-

Specialists in research, survey and monitoring

tested this sample and confirmed the presence of prills (solid granules) comprising mostly 4,4 DDT. Site JME090 also showed a larger than expected increase from 0.183 in 2015 to 2.2 mg/kg in 2025. Apart from these sites, the changes observed for DDX were within the normal environmental variability at these sites.

DDX levels for all the stream sites declined or were comparable to 2015, 2018 and 2022 samples (Table 2).

3.1.3 Comparisons with the previous sample event in 2022

Comparison of ADL between the present sample and the previous sample event in 2022 confirms an increase in ADL at the deep East FCC New 2 site. All other ADL values were little different between 2022 and 2025.

For DDX, shallow samples are little different between 2022 and 2025. For the deep samples the relatively large increase at two East FCC sites in 2025 is confirmed by relatively low values in 2022.

3.2 Shellfish and snail contaminant levels

In 2014 and 2015, ADL and DDX levels for the cockle (*Austrovenus stutchburyi*) at the East FCC shore reached an all-time low. In 2018 ADL and DDX levels remained low for cockles. In 2019, 2022 and 2025 cockle ADL and DDX remained low in cockles (Table 4).

ADL and DDX levels in mudflat snails (*Amphibola crenata*) from the west FCC site were elevated as were samples collected from 2009 to 2015, 2018, 2019 and in 2022. In the present sample, ADL levels in mudflat snails declined at West FCC site (JME084). In 2022 and 2025, were substantially lower than those recorded during the early monitoring period (2009–2015).

In 2015, contaminant levels in topshell (*Diloma subrostrata*) were low. Results from the 2019 sample showed a small increase from 2015 levels, but values remained comparable to 2018 contaminant levels (Table 4). The ADL and DDX levels in 2025 were below 2019 and 2022 levels.

Table 1. Summary of shallow sediment ADL (Aldrin, Dieldrin, Lindane) and DDX, levels from surface samples collected at all sites in 2025 and status of increase (pink) and decline (green) compared to 2015 results. Orange cells highlight values exceeding Soil Acceptance Criteria (SAC). All values are mg/kg dry weight.

SURFACE (0 - 2 cm)	SAC	West Control	West FCC JME 083	West FCC JME 081	West FCC JME 082	West FCC new1 (west)	West FCC new2 (middle)	West FCC new3 (east)	West FCC JME 084	East FCC JME 088	East FCC JME 087	East FCC JME 086	East FCC new1 (north)	East FCC new2 (south)	East FCC JME 090	East Control	West FCC Stream1 (low)	West FCC Stream2 (middle)	West FCC Stream3 (upper)
ADL (2015)	0.01	0.005	0.0089	0.0024	0.0015	0.002	0.0081	0.0015	0.0052	0.0018	0.0143	0.0015	0.0125	0.0016	0.0017	0.0015	0.0134	0.0694	0.036
ADL (2025)	0.01	<0.0015	0.0063	0.0015	0.0015	0.002	0.0021	0.0015	0.0015	0.0068	0.004	0.0015	0.0015	0.0015	0.0015	0.0015	0.0052	0.026	0.0015
2015 to 2025	0.01	No change	Decline	Decline	No change	Decline	Decline	No change	Decline	Increase	Decline	No change	Decline	Decline	Decline	No change	Decline	Decline	Decline
DDX (2015)	0.01	0.005	0.42	0.1187	0.0363	0.0386	0.4619	0.0575	0.0694	0.1547	0.0711	0.0142	0.6257	0.0602	0.289	0.003	0.3194	1.543	0.6158
DDX (2025)	0.01	<0.006	0.32	0.036	0.021	0.038	0.022	0.009	0.031	0.1	0.008	0.006	0.01	0.015	0.03	<0.006	0.109	0.5	0.65
2015 to 2025	0.01	No change	Decline	Decline	Decline	No change	Decline	Decline	Decline	Decline	Decline	Decline	Decline	Decline	Decline	No change	Decline	Decline	Increase

Table 2. Summary of deeper sediment ADL (Aldrin, Dieldrin, Lindane) and DDX, levels from surface samples collected at all sites in 2022 and status of increase (pink) and decline (green) compared to 2015 results. Orange cells highlight values exceeding Soil Acceptance Criteria (SAC). All values are mg/kg dry weight.

DEEP (6 - 10 cm)	SAC	West Control	West FCC JME 083	West FCC JME 081	West FCC JME 082	West FCC new1 (west)	West FCC new2 (middle)	West FCC new3 (east)	West FCC JME 084	East FCC JME 088	East FCC JME 087	East FCC JME 086	East FCC new1 (north)	East FCC new2 (south)	East FCC JME 090	East Control	West FCC Stream1 (low)	West FCC Stream2 (middle)	West FCC Stream3 (upper)
ADL (2015)	0.01	0.005	0.0326	0.0082	0.0015	0.0015	0.0015	0.0015	0.0085	0.0144	0.0029	0.0052	0.0031	0.1338	0.003	0.0015	0.0158	0.1488	0.2423
ADL (2025)	0.01	0.0015	0.0076	0.0039	0.0015	0.0032	0.0015	0.0015	0.0047	0.007	0.0143	0.0015	0.0015	0.0044	0.1	0.0015	0.0061	0.026	0.0015
2015 to 2025	0.01	No change	Decline	Decline	No change	Increase	No change	No change	Decline	Decline	Increase	Decline	Decline	Decline	Increase	No change	Decline	Decline	Decline
DDX (2015)	0.01	0.005	1.136	0.474	0.0036	0.0068	0.0183	0.0036	0.2369	1.3631	0.0479	0.1501	0.5386	3.9559	0.1823	0.003	0.3752	5.744	3.486
DDX (2025)	0.01	<0.006	0.68	0.89	0.016	0.088	0.058	0.011	0.146	93 #1	0.079	0.045	0.092	0.29	2.2	<0.006	0.184	0.36	0.38
2015 to 2025	0.01	No change	Decline	Increase	Increase	Increase	Increase	Increase	Decline	Increase	Increase	Decline	Decline	Decline	Increase	No change	Decline	Decline	Decline

Table 3. Summary of ADL and DDX from the previous 2022 sample.

SURFACE (0 - 2 cm)	SAC	West Control	West FCC JME 083	West FCC JME 081	West FCC JME 082	West FCC new1 (west)	West FCC new2 (middle)	West FCC new3 (east)	West FCC JME 084	East FCC JME 088	East FCC JME 087	East FCC JME 086	East FCC new1 (north)	East FCC new2 (south)	East FCC JME 090	East Control	West FCC Stream1 (low)	West FCC Stream2 (middle)	West FCC Stream3 (upper)
ADL (2022)	0.01	0.0015	0.0039	0.002	0.0015	0.0015	0.0015	0.0015	0.0015	0.0052	0.0015	0.0015	0.0015	0.0027	0.0049	0.0015	0.0065	0.0281	0.0092
DDX (2022)	0.01	0.003	0.24	0.068	0.019	0.015	0.014	0.008	0.008	0.047	0.012	0.014	0.023	0.077	0.043	0.003	0.156	0.55	0.67
DEEP (6 - 10 cm)																			
ADL (2022)	0.01	0.0015	0.0161	0.0052	0.0015	0.0015	0.0015	0.0015	0.0023	0.003	0.0178	0.0052	0.0024	0.0705	0.02845	0.0015	0.0057	0.01	0.0047
DDX (2022)	0.01	0.003	1.0	0.43	0.003	0.006	0.028	0.006	0.065	0.134	0.159	0.055	0.071	1.79	0.55	0.003	0.172	0.3	0.67

Table 4. ADL and DDX concentrations in mollusc species sampled from impact and control sites in 2019 (bottom), 2022 (middle) and 2025 (top). Orange coloured cells are > 0.01 mg/kg. Note: insufficient numbers of *Amphibola* were present on the East FCC beach in 2025.

May 2025

Location	West	West FCC	East FCC	East FCC	East FCC	East
Site	Control	JME 084	Composite	new2 (south)	New 2	Control
Species	Amphibola	Amphibola	Amphibola	Diloma	Cockle	Cockle
Substrata	Soft	Soft	Soft	Soft	Soft	Soft
ADL (aldrin, dieldrin, lindane)	0.0008	0.0064	NA	0.0032	0.0008	0.0008
DDX	0.0065	0.255	NA	0.0094	0.0015	0.0015

March 2022

Location	West	West FCC	East FCC	East FCC	East FCC	East
Site	Control	JME 084	Composite	new2 (south)	New 2	Control
Species	Amphibola	Amphibola	Amphibola	Diloma	Cockle	Cockle
Substrata	Soft	Soft	Soft	Soft	Soft	Soft
ADL (aldrin, dieldrin, lindane)	0.001	0.0094	0.0965	0.0026	0.00075	0.00075
DDX	0.02065	0.3503	0.2496	0.01295	0.00125	0.00125

Note 1: <0.001 type values have been halved to calculate means

March 2019

Location	West	West FCC	East FCC	East FCC	East FCC	East
Site	Control	JME 084	Composite	new2 (south)	New 2	Control
Species	Amphibola	Amphibola	Amphibola	Diloma	Cockle	Cockle
Substrata	Soft	Soft	Soft	Soft	Soft	Soft
ADL (aldrin, dieldrin, lindane)	0.00075	0.0295	0.0685	0.002	0.0073	0.00075
DDX	0.01725	1.1372	0.2621	0.0137	0.00195	0.0015

4.0 Patterns of contamination

4.1 Sediments

In the 2009 auditor's report, it was stated that the SAC for DDX and ADL in estuarine sediments was not met (Pattle Delamore, 2009). By 2018, 2019, 2022 most of the shallow and deeper sediments (excluding the West FCC stream, and a small number of other sites) met the SAC for ADL. In the present study, ADL was met for all shallow sites but most deep sites remained above the SAC.

DDX levels in 2025 remained above the SAC at most FCC sites, however, levels for most shallow sites were considerably lower compared to 2015. DDX at deeper sites remained above the SAC and in many cases were close to or above 2015 levels.

Historically, most concern existed around the upper stream site. Sediment recontamination occurred in previous years and probably came from a "hot spot" in the adjacent land (Davidson and Sheldon, 2016). Some comfort was provided by the decline in ADL and DDX at West FCC stream 3 (upper) from 2015 to 2018 and 2019. Based on 2015 results, Davidson and Sheldon (2016) suggested, "new contaminants have ceased, and the "hotspot" source may have stabilized as the auditor originally suggested may occur (Pattle Delamore, 2011)." In 2022 and the present sample event the stream sites appeared stable, however, elevated levels of contamination remain.

In 2025, a high record of DDX was recorded at JME 088 on the eastern FCC beach (93 mg/kg). The highest previous sample since the remediation ended in 2009 was 1.36, however, it is noted that samples collected earlier in 2005 at this site reached 273 mg/kg. The reason for the appearance of prills of DDX in sediments near the surface is best explained due to excavations that occurred in this area in 2022 (Plate 1). It is probable contaminated material was brought closer to the surface during these excavations.

Specialists in research, survey and monitoring



Plate 1. Excavations in 2022 from the east FCC beach.

4.2 Biota

Cockle contaminants at the East FCC reached low levels in 2019 and 2022. ADL and DDX in mudflat snails remained above controls levels. For mudflat snails, ADL and DDX values have historically been very high. For example, at West FCC (JME084), DDX values declined from 51.14 mg/kg in 2007 to 0.7589 mg/kg in 2018. Levels in 2019, 2022 and 2025 were dramatically lower. A further decline in ADL and DDX was recorded from the West FCC site (JME084) in the present study. DDX at the west FCC site does, however, remain elevated compared to the control.

Cockles are the species most likely to be gathered and consumed by humans. Contaminant levels in cockles at the East FCC site in 2022 were very close to those collected from the control site. In 2025 cockle contamination fell to very low levels found at the control site.

5.0 Recommendations

Overall, most sites have exhibited a reduction in contamination levels over the duration of the study. This has been a relatively consistent trend since the start of the study in 2009.

DDX, however, remains widespread and represents the dominant contaminant in sediments and shellfish.

Areas of concern remain at the West FCC stream and DDX contaminant levels at deeper sediment sites. Of particular concern is the high record at an East FCC site and the observations of DDX prills at several sites on the east beach.

Sediment sampling

Results from the west FCC sites continue to show contamination, however, ADL levels appear to be at or close to acceptable levels and DDX levels are either stable or decreasing. Monitoring every third year is recommended.

The detection of a high level of DDX on the east FCC beach is concerning. It is recommended the extent of excavations be mapped and described followed by a plan to collect additional samples down to 10 cm depth be implemented. The aim being to determine the extent of contamination in sediments close to the surface. Once this information is known an independent site auditor would then be able to make recommendations on how best to proceed.

Biota sampling

It is suggested that monitoring be maintained at every third year, in alignment with prior intervals. It is also recommended that the same sample sites and species be used for all future sampling. This will ensure continuity and aid with interpretation of trends.

References

- Davidson, R.J.; Rayes, C.; T. Scott-Simmonds 2022. Summary of post-remediation contaminant monitoring of sediment and shellfish from estuarine areas adjacent to the former Fruitgrowers Chemical Company (FCC) site, Mapua, Nelson (2022). Prepared by Davidson Environmental Ltd. for Tasman District Council. Survey and monitoring report no. 1125.
- Davidson, R.J.; Rayes, C.; T. Scott-Simmonds 2019. Summary of post-remediation contaminant monitoring of sediments and shellfish from estuarine areas adjacent to the former Fruitgrowers Chemical Company (FCC) site, Mapua, Nelson (2019). Prepared by Davidson Environmental Ltd. for Tasman District Council. Survey and monitoring report no. 935.
- Davidson, R.J.; Richards, L.A.; Sheldon, P. 2016. Post-remediation contaminant monitoring of sediments and biota from estuarine sites located adjacent to the former Fruitgrowers Chemical Company (FCC) site, Mapua, Nelson (2013-2016). Prepared by Davidson Environmental Limited for Tasman District Council and Ministry for the Environment. Survey and monitoring report 842.
- Davidson, R.J.; Richards, L.A.; Easton, J. 2012. Post-remediation contaminant monitoring of sediments and biota from estuarine sites located adjacent to the former Fruitgrowers Chemical Company (FCC) site, Mapua, Nelson (sample 3). Prepared by Davidson Environmental Limited for Tasman District Council and Ministry for the Environment. Survey and monitoring report 710.
- Davidson, R. J.; Richards, L.A.; Easton, J. 2010. Post-remediation monitoring of sediments and biota from estuarine sites located adjacent to the former Fruitgrowers Chemical Company (FCC) site, Mapua, Nelson. Prepared by Davidson Environmental Limited for Tasman District Council and Ministry for the Environment. Survey and monitoring report no. 616.
- Davidson, R.J.; Richards, L.A.; Easton, J. 2011. Post-remediation monitoring of sediments and biota from estuarine sites located adjacent to the former Fruitgrowers Chemical Company (FCC) site, Mapua, Nelson (sample 2). Prepared by Davidson Environmental Limited for Tasman District Council and Ministry for the Environment. Survey and monitoring report 680.
- Davidson, R.J.; Richards, L.A.; Easton, J. 2012. Post-remediation contaminant monitoring of sediments and biota from estuarine sites located adjacent to the former Fruitgrowers Chemical Company (FCC) site, Mapua, Nelson (sample 3). Prepared by Davidson Environmental Limited for Tasman District Council and Ministry for the Environment. Survey and monitoring report 710.
- Davidson, R.J.; Sheldon, P. 2016. Post-remediation contaminant monitoring of sediments and biota from estuarine sites located adjacent to the former Fruitgrowers Chemical Company (FCC) site, Mapua, Nelson (2013-2016).



Specialists in research, survey and monitoring

Prepared by Davidson Environmental Limited for Tasman District Council and Ministry for the Environment. Survey and monitoring report 842.

Pattle Delamore Partners Ltd. 2009. Audit of the remediation of the former Fruitgrowers Chemical Company site, Mapua. A report prepared by Mike Clyde and Graeme Proffitt for the Ministry of the Environment. File W01738100 R01.

Pattle Delamore Partners Ltd. 2011. Mapua FCC site remediation – Review of post-remediation monitoring (draft). A report prepared by Karen Sky and Graeme Proffitt for the Ministry of the Environment. File W01738103 R01.

Acknowledgements

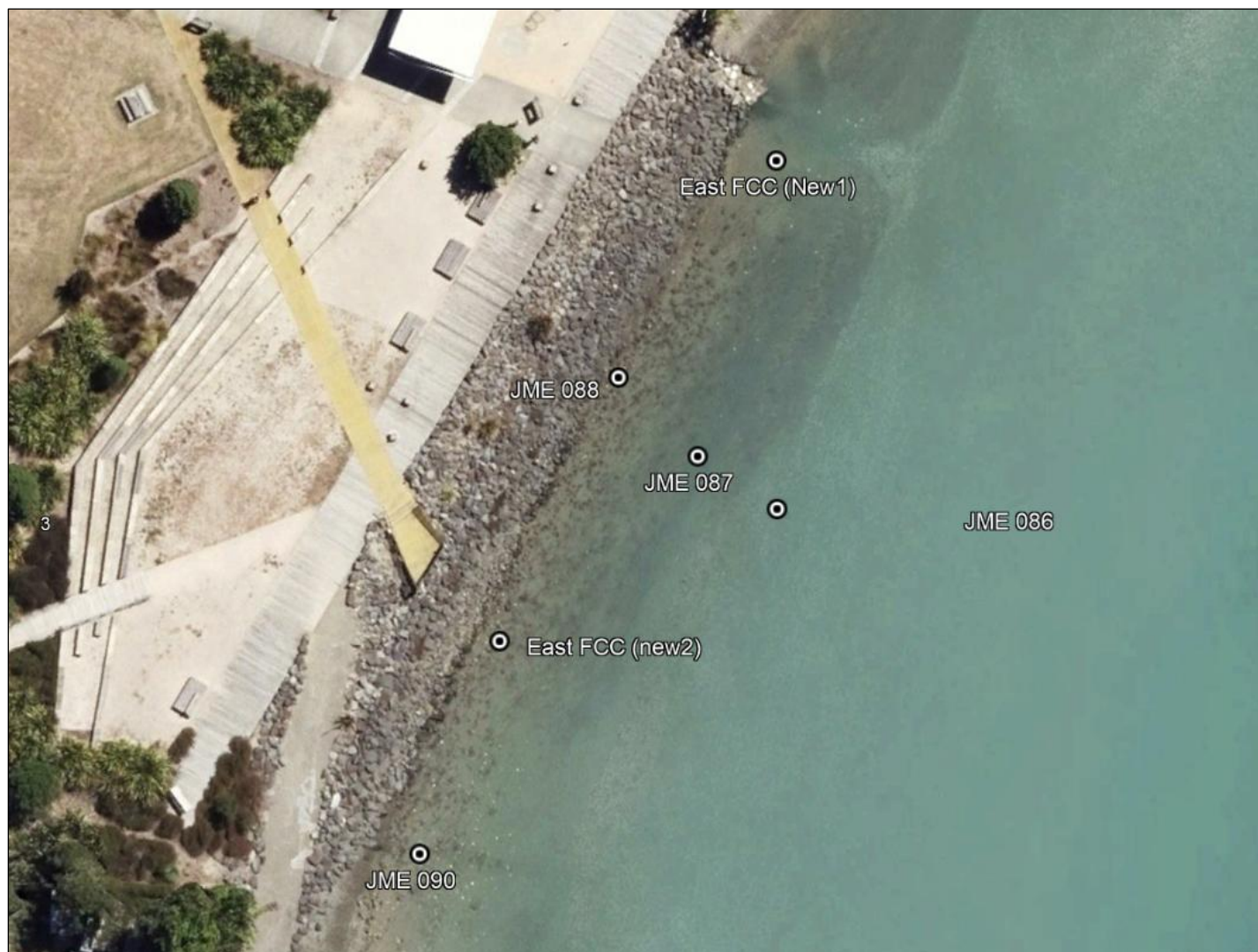
Thanks to Anna MacKenzie of TDC for very helpful comments on the report.

Appendix 1. Sediment sample sites.

Type	Site number	Coordinates	Strata	OCP surface	OCP deep
West control	JME 080	41° 15.482'S, 173° 5.540'E	0-2 cm & 8-10 cm	1	1
Impact (west)	JME 083	41° 15.463'S, 173° 5.819'E	0-2 cm & 8-10 cm	1	1
Impact (west)	JME 081	41° 15.484'S, 173° 5.821'E	0-2 cm & 8-10 cm	1	1
Impact (west)	JME 082	41° 15.501'S, 173° 5.825'E	0-2 cm & 8-10 cm	1	1
Impact (west)	West FCC new 1 (west)	41° 15.471'S, 173° 5.849'E	0-2 cm & 8-10 cm	1	1
Impact (west)	West FCC new 2 (middle)	41° 15.473'S, 173° 5.867'E	0-2 cm & 8-10 cm	1	1
Impact (west)	West FCC new 3 (east)	41° 15.480'S, 173° 5.879'E	0-2 cm & 8-10 cm	1	1
Impact (west)	JME 084	41° 15.484'S, 173° 5.859'E	0-2 cm & 8-10 cm	1	1
Impact (west)	West FCC Stream 1 (lower)	41° 15.446'S, 173° 5.839'E	0-2 cm & 8-10 cm	1	1
Impact (west)	West FCC Stream 2 (middle)	41° 15.433'S, 173° 5.863'E	0-2 cm & 8-10 cm	1	1
Impact (west)	West FCC Stream 1 (upper)	41° 15.425'S, 173° 5.877'E	0-2 cm & 8-10 cm	1	1
Impact (east)	JME 088	41° 15.418'S, 173° 6.089'E	0-2 cm & 6-8 cm	1	1
Impact (east)	JME 087	41° 15.421'S, 173° 6.093'E	0-2 cm & 6-8 cm	1	1
Impact (east)	JME 086	41° 15.423'S, 173° 6.097'E	0-2 cm & 8-10 cm	1	1
Impact (east)	East FCC New 1 (north)	41° 15.410'S, 173° 6.097'E	0-2 cm & 6-8 cm	1	1
Impact (east)	East FCC New 2 (south)	41° 15.428'S, 173° 6.083'E	0-2 cm & 6-8 cm	1	1
Impact (east)	JME 090	41° 15.436'S, 173° 6.079'E	0-2 cm & 6-10 cm	1	1
East control	Hunter-Brown	41° 16.187'S, 173° 6.497'E	0-2 cm & 6-8 cm	1	1
TOTAL SAMPLES				18	18

Western FCC sample sites





Appendix 2. Invertebrate sample sites located at impact (FCC) and control sites.

Type	Site number	Coordinates	Samples per site
West control	JME 080 (<i>Amphibola</i>)	41° 15.482'S, 173° 5.540'E	1
West FCC	JME 084 (<i>Amphibola</i>)	41° 15.484'S, 173° 5.859'E	1
East FCC (composite)	East FCC (<i>Amphibola</i>)	see Figure 4	1
East FCC	New2 (south) (<i>Diloma</i>)	41° 15.428'S, 173° 6.083'E	1
East FCC (JME 090)	East FCC (cockle)	41° 15.436'S, 173° 6.079'E	1
East control	Hunter-Brown (cockle)	41° 16.190'S, 173° 6.497'E	1
TOTAL SAMPLES			6



Appendix 3. Sediment raw data 2025



R J Hill Laboratories Limited
28 Duke Street Frankton 3204
Private Bag 3205
Hamilton 3240 New Zealand

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

Certificate of Analysis

Page 1 of 6

Client:	Davidson Environmental Limited	Lab No:	3886640	SPv1
Contact:	R Davidson	Date Received:	13-May-2025	
	C/- Davidson Environmental Limited	Date Reported:	05-Jun-2025	
	6 Ngapua Place	Quote No:	91901	
	Atawhai	Order No:		
	Nelson 7010	Client Reference:	Mapua	
		Submitted By:	R Davidson	

Sample Type: Sediment						
Sample Name:	West FCC Stream Lower (Shallow)	West FCC Stream Lower (Deep)	West FCC Stream Mid (Shallow)	West FCC Stream Mid (Deep)	West FCC Stream Upper (Shallow)	West FCC Stream Upper (Deep)
	11-May-2025 11:30 am	11-May-2025 11:30 am	11-May-2025 11:35 am	11-May-2025 11:35 am	11-May-2025 11:39 am	11-May-2025 11:39 am
Lab Number:	3886640.1	3886640.2	3886640.3	3886640.4	3886640.5	
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0135	0.0193	0.064	0.050	0.093
4,4'-DDD	mg/kg dry wt	0.033	0.049	0.177	0.139	0.27
2,4'-DDE	mg/kg dry wt	0.0050	0.0105	0.026	0.020	0.051
4,4'-DDE	mg/kg dry wt	0.050	0.090	0.21	0.143	0.22
2,4'-DDT	mg/kg dry wt	0.0012	0.0013	0.0038	0.0020	0.0030
4,4'-DDT	mg/kg dry wt	0.0074	0.0133	0.0168	0.0095	0.0156
Total DDT Isomers	mg/kg dry wt	0.109	0.184	0.50	0.36	0.65
Dieldrin	mg/kg dry wt	0.0042	0.0051	0.025	0.025	0.0185
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	0.0011	< 0.0010	0.0148	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Sample Name:	West FCC Stream Upper (Deep)	JME080 (Shallow)	JME080 (Deep)	JME083 (Shallow)	JME083 (Deep)	
	11-May-2025 11:39 am	11-May-2025 11:53 am	11-May-2025 11:55 am	11-May-2025 12:06 pm	11-May-2025 12:08 pm	
Lab Number:	3886640.6	3886640.7	3886640.8	3886640.9	3886640.10	



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised. The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Sediment						
Sample Name:	West FCC Stream Upper (Deep) 11-May-2025 11:39 am	JME080 (Shallow) 11-May-2025 11:53 am	JME080 (Deep) 11-May-2025 11:55 am	JME083 (Shallow) 11-May-2025 12:06 pm	JME083 (Deep) 11-May-2025 12:08 pm	
Lab Number:	3886640.6	3886640.7	3886640.8	3886640.9	3886640.10	
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	0.0013
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.048	< 0.0010	< 0.0010	0.043	0.098
4,4'-DDD	mg/kg dry wt	0.164	< 0.0010	< 0.0010	0.121	0.28
2,4'-DDE	mg/kg dry wt	0.021	< 0.0010	< 0.0010	0.020	0.045
4,4'-DDE	mg/kg dry wt	0.124	< 0.0010	< 0.0010	0.124	0.24
2,4'-DDT	mg/kg dry wt	0.0036	< 0.0010	< 0.0010	0.0020	0.0029
4,4'-DDT	mg/kg dry wt	0.0146	0.0012	< 0.0010	0.0097	0.0129
Total DDT Isomers	mg/kg dry wt	0.38	< 0.006	< 0.006	0.32	0.68
Dieldrin	mg/kg dry wt	0.0049	< 0.0010	< 0.0010	0.0053	0.0066
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Sample Name:	JME081 (Shallow) 11-May-2025 12:10 pm	JME081 (Deep) 11-May-2025 12:11 pm	JME082 (Shallow) 11-May-2025 12:14 pm	JME082 (Deep) 11-May-2025 12:15 pm	West FCC New1 (Shallow) 11-May-2025 12:23 pm	
Lab Number:	3886640.11	3886640.12	3886640.13	3886640.14	3886640.15	
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	0.0022	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	0.0012	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0047	0.131	0.0029	0.0014	0.0033
4,4'-DDD	mg/kg dry wt	0.0107	0.34	0.0032	0.0043	0.0082
2,4'-DDE	mg/kg dry wt	0.0017	0.057	0.0010	< 0.0010	< 0.0010
4,4'-DDE	mg/kg dry wt	0.0173	0.32	0.0128	0.0088	0.0115
2,4'-DDT	mg/kg dry wt	< 0.0010	0.0066	< 0.0010	< 0.0010	0.0057
4,4'-DDT	mg/kg dry wt	0.0015	0.037	< 0.0010	< 0.0010	0.009
Total DDT Isomers	mg/kg dry wt	0.036	0.89	0.021	0.016	0.038
Dieldrin	mg/kg dry wt	< 0.0010	0.0071	< 0.0010	< 0.0010	0.0015
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Sample Type: Sediment						
Sample Name:		JME081 (Shallow) 11-May-2025 12:10 pm	JME081 (Deep) 11-May-2025 12:11 pm	JME082 (Shallow) 11-May-2025 12:14 pm	JME082 (Deep) 11-May-2025 12:15 pm	West FCC New1 (Shallow) 11-May-2025 12:23 pm
Lab Number:		3886640.11	3886640.12	3886640.13	3886640.14	3886640.15
Organochlorine Pesticides Trace in Soil						
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Sample Name:		West FCC New1 (Deep) 11-May-2025 12:24 pm	West FCC New2 (Shallow) 11-May-2025 12:26 pm	West FCC New2 (Deep) 11-May-2025 12:27 pm	West FCC New3 (Shallow) 11-May-2025 12:29 pm	West FCC New3 (Deep) 11-May-2025 12:30 pm
Lab Number:		3886640.16	3886640.17	3886640.18	3886640.19	3886640.20
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0077	0.0025	0.0063	0.0011	0.0013
4,4'-DDD	mg/kg dry wt	0.021	0.0053	0.0154	0.0024	0.0028
2,4'-DDE	mg/kg dry wt	< 0.0010	< 0.0010	0.0020	< 0.0010	< 0.0010
4,4'-DDE	mg/kg dry wt	0.0160	0.0120	0.032	0.0039	0.0054
2,4'-DDT	mg/kg dry wt	0.0029	< 0.0010	< 0.0010	< 0.0010	< 0.0010
4,4'-DDT	mg/kg dry wt	0.039	0.0014	0.0020	0.0015	< 0.0010
Total DDT Isomers	mg/kg dry wt	0.088	0.022	0.058	0.009	0.011
Dieldrin	mg/kg dry wt	0.0022	0.0011	< 0.0010	< 0.0010	< 0.0010
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Sample Name:		JME084 (Shallow) 11-May-2025 12:35 pm	JME084 (Deep) 11-May-2025 12:37 pm	JME090 (Shallow) 11-May-2025 1:55 pm	JME090 (Deep) 11-May-2025 1:57 pm	East FCC New2 (Shallow) 11-May-2025 1:59 pm
Lab Number:		3886640.21	3886640.22	3886640.23	3886640.24	3886640.25
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	0.0034	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0027	0.0161	0.0044	0.31	0.0018
4,4'-DDD	mg/kg dry wt	0.0057	0.031	0.0152	1.03	0.0060
2,4'-DDE	mg/kg dry wt	< 0.0010	0.0047	< 0.0010	0.024	< 0.0010
4,4'-DDE	mg/kg dry wt	0.0136	0.086	0.0076	0.38	0.0040
2,4'-DDT	mg/kg dry wt	< 0.0010	0.0011	< 0.0010	0.088	< 0.0010
4,4'-DDT	mg/kg dry wt	0.0081	0.007	0.0032	0.39	0.0027
Total DDT Isomers	mg/kg dry wt	0.031	0.146	0.030	2.2	0.015

Sample Type: Sediment						
Sample Name:		JME084 (Shallow) 11-May-2025 12:35 pm	JME084 (Deep) 11-May-2025 12:37 pm	JME090 (Shallow) 11-May-2025 1:55 pm	JME090 (Deep) 11-May-2025 1:57 pm	East FCC New2 (Shallow) 11-May-2025 1:59 pm
Lab Number:		3886640.21	3886640.22	3886640.23	3886640.24	3886640.25
Organochlorine Pesticides Trace in Soil						
Dieldrin	mg/kg dry wt	< 0.0010	0.0037	< 0.0010	0.099	< 0.0010
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Sample Name:		East FCC New2 (Deep) 11-May-2025 2:01 pm	JME088 (Shallow) 11-May-2025 2:04 pm	JME088 (Deep) 11-May-2025 2:05 pm	East FCC New1 (Shallow) 11-May-2025 2:19 pm	East FCC New1 (Deep) 11-May-2025 2:21 pm
Lab Number:		3886640.26	3886640.27	3886640.28	3886640.29	3886640.30
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	0.0011	< 0.0010	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.044	0.0078	0.186	< 0.0010	0.0045
4,4'-DDD	mg/kg dry wt	0.141	0.0167	0.42	0.0033	0.0114
2,4'-DDE	mg/kg dry wt	0.0044	0.0013	0.0039	< 0.0010	0.0022
4,4'-DDE	mg/kg dry wt	0.062	0.021	0.067	0.0048	0.024
2,4'-DDT	mg/kg dry wt	0.0044	0.0115	3.1	< 0.0010	< 0.0010
4,4'-DDT	mg/kg dry wt	0.033	0.041	90 #1	< 0.0010	0.050
Total DDT Isomers	mg/kg dry wt	0.29	0.100	93	0.010	0.092
Dieldrin	mg/kg dry wt	0.0034	0.0058	0.0060	< 0.0010	< 0.0010
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Sample Name:		JME087 (Shallow) 11-May-2025 2:10 pm	JME087 (Deep) 11-May-2025 2:11 pm	JME086 (Shallow) 11-May-2025 2:14 pm	JME086 (Deep) 11-May-2025 2:15 pm	Hunter Brown (Shallow) 11-May-2025 3:22 pm
Lab Number:		3886640.31	3886640.32	3886640.33	3886640.34	3886640.35
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	0.0011	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Sample Type: Sediment						
Sample Name:		JME087 (Shallow) 11-May-2025 2:10 pm	JME087 (Deep) 11-May-2025 2:11 pm	JME086 (Shallow) 11-May-2025 2:14 pm	JME086 (Deep) 11-May-2025 2:15 pm	Hunter Brown (Shallow) 11-May-2025 3:22 pm
Lab Number:		3886640.31	3886640.32	3886640.33	3886640.34	3886640.35
Organochlorine Pesticides Trace in Soil						
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0011	0.0149	< 0.0010	0.0061	< 0.0010
4,4'-DDD	mg/kg dry wt	0.0028	0.041	< 0.0010	0.0142	< 0.0010
2,4'-DDE	mg/kg dry wt	< 0.0010	0.0025	< 0.0010	0.0025	< 0.0010
4,4'-DDE	mg/kg dry wt	0.0021	0.0169	< 0.0010	0.0153	< 0.0010
2,4'-DDT	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
4,4'-DDT	mg/kg dry wt	0.0016	0.0036	< 0.0010	0.0067	< 0.0010
Total DDT Isomers	mg/kg dry wt	0.008	0.079	< 0.006	0.045	< 0.006
Dieldrin	mg/kg dry wt	0.0030	0.0133	< 0.0010	< 0.0010	< 0.0010
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Sample Name:		Hunter Brown (Deep) 11-May-2025 3:24 pm				
Lab Number:		3886640.36				
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010				
alpha-BHC	mg/kg dry wt	< 0.0010				
beta-BHC	mg/kg dry wt	< 0.0010				
delta-BHC	mg/kg dry wt	< 0.0010				
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010				
cis-Chlordane	mg/kg dry wt	< 0.0010				
trans-Chlordane	mg/kg dry wt	< 0.0010				
2,4'-DDD	mg/kg dry wt	< 0.0010				
4,4'-DDD	mg/kg dry wt	< 0.0010				
2,4'-DDE	mg/kg dry wt	< 0.0010				
4,4'-DDE	mg/kg dry wt	< 0.0010				
2,4'-DDT	mg/kg dry wt	< 0.0010				
4,4'-DDT	mg/kg dry wt	< 0.0010				
Total DDT Isomers	mg/kg dry wt	< 0.006				
Dieldrin	mg/kg dry wt	< 0.0010				
Endosulfan I	mg/kg dry wt	< 0.0010				
Endosulfan II	mg/kg dry wt	< 0.0010				
Endosulfan sulphate	mg/kg dry wt	< 0.0010				
Endrin	mg/kg dry wt	< 0.0010				
Endrin aldehyde	mg/kg dry wt	< 0.0010				
Endrin ketone	mg/kg dry wt	< 0.0010				
Heptachlor	mg/kg dry wt	< 0.0010				
Heptachlor epoxide	mg/kg dry wt	< 0.0010				
Hexachlorobenzene	mg/kg dry wt	< 0.0010				
Methoxychlor	mg/kg dry wt	< 0.0010				
Analyst's Comments						
#1 High level of 4,4-DDT was confirmed by re-analysis.						

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 Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Sediment			
Test	Method Description	Default Detection Limit	Sample No
Soil Prep Dry for Organics, Trace*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-36
Organochlorine Pesticides Trace in Soil	Sonication extraction, GC-ECD analysis. In-house based on US EPA 8081.	0.0010 - 0.006 mg/kg dry wt	1-36

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

Testing was completed between 14-May-2025 and 05-Jun-2025. 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.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Ara Heron BSc (Tech)
Client Services Manager - Environmental

Appendix 4. Biota data 2025



R J Hill Laboratories Limited
28 Duke Street Frankton 3204
Private Bag 3205
Hamilton 3240 New Zealand

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

Certificate of Analysis

Page 1 of 2

Client:	Davidson Environmental Limited	Lab No:	3886639	SPv2
Contact:	R Davidson	Date Received:	13-May-2025	
	C/- Davidson Environmental Limited	Date Reported:	11-Jun-2025	
	6 Ngapua Place	Quote No:	91901	
	Atawhai	Order No:		
	Nelson 7010	Client Reference:	Mapua	
		Submitted By:	R Davidson	

Sample Type: Shellfish						
Sample Name:	JME 080 Amphibola 11-May-2025 12:00 pm	JME 084 Amphibola 11-May-2025 12:40 pm	New 2 (South) Diloma 11-May-2025 2:20 pm	East FCC Cockle 11-May-2025 2:45 pm	Hunter-Brown Cockle 11-May-2025 3:25 pm	
Lab Number:	3886639.1	3886639.2	3886639.3	3886639.4	3886639.5	
Individual Tests						
Dry Matter	g/100g as rcvd	11.3	10.8	21	9.9	9.5
Organochlorine Pesticides in Biomatter						
Aldrin	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
alpha-BHC	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
beta-BHC	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
delta-BHC	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
gamma-BHC (Lindane)	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
cis-Chlordane	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
trans-Chlordane	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
2,4'-DDD	mg/kg	< 0.0005	0.0083	-	< 0.0005	< 0.0005
4,4'-DDD	mg/kg	0.0012	0.0199	-	< 0.0005	< 0.0005
2,4'-DDE	mg/kg	< 0.0005	0.0008	-	< 0.0005	< 0.0005
4,4'-DDE	mg/kg	0.0038	0.22	-	< 0.0005	< 0.0005
2,4'-DDT	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
4,4'-DDT	mg/kg	0.0007	0.0062	-	< 0.0005	< 0.0005
Dieldrin	mg/kg	< 0.0005	0.0054	-	< 0.0005	< 0.0005
Endosulfan I	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
Endosulfan II	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
Endosulfan sulfate	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
Endrin	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
Endrin aldehyde	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
Endrin ketone	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
Heptachlor	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
Heptachlor epoxide	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
Hexachlorobenzene	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
Methoxychlor	mg/kg	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005
Sample Name:		New 2 (South) Diloma				
Lab Number:		3886639.6				
Organochlorine Pesticides in Biomatter						
Aldrin	mg/kg	< 0.0005				
alpha-BHC	mg/kg	< 0.0005				
beta-BHC	mg/kg	< 0.0005				
delta-BHC	mg/kg	< 0.0005				
gamma-BHC (Lindane)	mg/kg	< 0.0005				
cis-Chlordane	mg/kg	< 0.0005				
trans-Chlordane	mg/kg	< 0.0005				
2,4'-DDD	mg/kg	0.0005				
4,4'-DDD	mg/kg	0.0032				
2,4'-DDE	mg/kg	< 0.0005				

Lab No: 3886639-SPv2

Hill Labs

Page 1 of 2

Sample Type: Shellfish		
Sample Name:		New 2 (South) Diloma
Lab Number:		3886639.6
Organochlorine Pesticides in Biomatter		
4,4'-DDE	mg/kg	0.0041
2,4'-DDT	mg/kg	< 0.0005
4,4'-DDT	mg/kg	0.0011
Dieldrin	mg/kg	0.0027
Endosulfan I	mg/kg	< 0.0005
Endosulfan II	mg/kg	< 0.0005
Endosulfan sulfate	mg/kg	< 0.0005
Endrin	mg/kg	< 0.0005
Endrin aldehyde	mg/kg	< 0.0005
Endrin ketone	mg/kg	< 0.0005
Heptachlor	mg/kg	< 0.0005
Heptachlor epoxide	mg/kg	< 0.0005
Hexachlorobenzene	mg/kg	< 0.0005
Methoxychlor	mg/kg	< 0.0005

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 Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Shellfish			
Test	Method Description	Default Detection Limit	Sample No
Homogenisation of Biological samples for Organics Tests	Mincing, chopping, or blending of sample to form homogenous sample fraction.	-	6
Shucking of Shellfish	Removal of tissue from shell.	-	1-6
Homogenise	Mincing, chopping, or blending of sample to form homogenous sample fraction.	-	1-5
Dry Matter	Drying for 16 hours at 103°C, gravimetry. In-house based on AOAC 945.15.	0.10 g/100g as rcvd	1-5
Organochlorine Pesticides in Biomatter	Sonication extraction, GC-ECD analysis. In-house based on US EPA 8081.	0.0005 mg/kg	1-2, 4-6

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

Testing was completed between 13-May-2025 and 11-Jun-2025. 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.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

Ara Heron BSc (Tech)
Client Services Manager - Environmental

Appendix 5. Sediment data 2022



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

Page 1 of 6

Client:	Davidson Environmental Ltd	Lab No:	2937698	SPv1
Contact:	R Davidson	Date Received:	30-Mar-2022	
	C/- Davidson Environmental Ltd	Date Reported:	20-Apr-2022	
	6 Ngapua Place	Quote No:	91901	
	Atawhai	Order No:		
	Nelson 7010	Client Reference:		
		Submitted By:	R Davidson	

Sample Type: Sediment

Sample Name:	JME 080 Deep 25-Mar-2022 9:46 am	JME 080 Shallow 25-Mar-2022 9:45 am	JME 083 Deep 25-Mar-2022 9:21 am	JME 083 Shallow 25-Mar-2022 9:20 am	JME 081 Deep 25-Mar-2022 9:17 am
Lab Number:	2937698.1	2937698.2	2937698.3	2937698.4	2937698.5

Organochlorine Pesticides Trace in Soil

Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	0.0028	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	0.0029	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	< 0.0010	< 0.0010	0.111	0.026	0.039
4,4'-DDD	mg/kg dry wt	< 0.0010	< 0.0010	0.35	0.075	0.141
2,4'-DDE	mg/kg dry wt	< 0.0010	< 0.0010	0.059	0.0127	0.027
4,4'-DDE	mg/kg dry wt	< 0.0010	< 0.0010	0.38	0.105	0.192
2,4'-DDT	mg/kg dry wt	< 0.0010	< 0.0010	0.0095	0.0029	0.0030
4,4'-DDT	mg/kg dry wt	< 0.0010	< 0.0010	0.088	0.0158	0.032
Total DDT Isomers	mg/kg dry wt	< 0.006	< 0.006	1.00	0.24	0.43
Dieldrin	mg/kg dry wt	< 0.0010	< 0.0010	0.0104	0.0029	0.0042
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Sample Name:	JME 081 Shallow 25-Mar-2022 9:16 am	West FCC new1 Deep (west) 25-Mar-2022 9:31 am	West FCC new1 Shallow (west) 25-Mar-2022 9:30 am	West FCC new2 Deep (middle) 25-Mar-2022 9:36 am	West FCC new2 Shallow (middle) 25-Mar-2022 9:35 am
Lab Number:	2937698.6	2937698.7	2937698.8	2937698.9	2937698.10

Organochlorine Pesticides Trace in Soil

Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised. The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Sediment						
Sample Name:	JME 081 Shallow 25-Mar-2022 9:16 am	West FCC new1 Deep (west) 25-Mar-2022 9:31 am	West FCC new1 Shallow (west) 25-Mar-2022 9:30 am	West FCC new2 Deep (middle) 25-Mar-2022 9:36 am	West FCC new2 Shallow (middle) 25-Mar-2022 9:35 am	
Lab Number:	2937698.6	2937698.7	2937698.8	2937698.9	2937698.10	
Organochlorine Pesticides Trace in Soil						
2,4'-DDD	mg/kg dry wt	0.0066	< 0.0010	< 0.0010	0.0027	0.0012
4,4'-DDD	mg/kg dry wt	0.0176	0.0012	0.0034	0.0078	0.0038
2,4'-DDE	mg/kg dry wt	0.0032	< 0.0010	< 0.0010	0.0014	< 0.0010
4,4'-DDE	mg/kg dry wt	0.028	0.0049	0.0074	0.0139	0.0073
2,4'-DDT	mg/kg dry wt	0.0031	< 0.0010	< 0.0010	< 0.0010	< 0.0010
4,4'-DDT	mg/kg dry wt	0.0091	< 0.0010	0.0036	0.0011	0.0014
Total DDT Isomers	mg/kg dry wt	0.068	0.006	0.015	0.028	0.014
Dieldrin	mg/kg dry wt	0.0011	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Sample Name:	West FCC new3 Deep (east) 25-Mar-2022 9:41 am	West FCC new3 Shallow (east) 25-Mar-2022 9:40 am	JME 084 Deep 25-Mar-2022 9:26 am	JME 084 Shallow 25-Mar-2022 9:25 am	West FCC Stream 1 Deep (low) 25-Mar-2022 9:56 am	
Lab Number:	2937698.11	2937698.12	2937698.13	2937698.14	2937698.15	
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	< 0.0010	< 0.0010	0.0036	< 0.0010	0.0138
4,4'-DDD	mg/kg dry wt	0.0014	0.0019	0.0199	0.0019	0.041
2,4'-DDE	mg/kg dry wt	< 0.0010	< 0.0010	0.0022	< 0.0010	0.0090
4,4'-DDE	mg/kg dry wt	0.0036	0.0041	0.023	0.0041	0.096
2,4'-DDT	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	0.0016
4,4'-DDT	mg/kg dry wt	< 0.0010	0.0015	0.0157	0.0011	0.0108
Total DDT Isomers	mg/kg dry wt	0.006	0.008	0.065	0.008	0.172
Dieldrin	mg/kg dry wt	< 0.0010	< 0.0010	0.0013	< 0.0010	0.0047
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Sample Name:	West FCC Stream 1 Shallow (low) 25-Mar-2022 9:55 am	West FCC Stream 2 Deep (middle) 25-Mar-2022 10:01 am	West FCC Stream 2 Shallow (middle) 25-Mar-2022 10:00 am	West FCC Stream 3 Deep (upper) 25-Mar-2022 10:11 am	West FCC Stream 3 Shallow (upper) 25-Mar-2022 10:10 am	
Lab Number:	2937698.16	2937698.17	2937698.18	2937698.19	2937698.20	

Sample Type: Sediment						
Sample Name:	West FCC Stream 1 Shallow (low) 25-Mar-2022 9:55 am	West FCC Stream 2 Deep (middle) 25-Mar-2022 10:01 am	West FCC Stream 2 Shallow (middle) 25-Mar-2022 10:00 am	West FCC Stream 3 Deep (upper) 25-Mar-2022 10:11 am	West FCC Stream 3 Shallow (upper) 25-Mar-2022 10:10 am	
Lab Number:	2937698.16	2937698.17	2937698.18	2937698.19	2937698.20	
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	0.0026	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0170	0.0174	0.034	0.090	0.054
4,4'-DDD	mg/kg dry wt	0.048	0.045	0.079	0.21	0.173
2,4'-DDE	mg/kg dry wt	0.0077	0.0128	0.0166	0.0063	0.0171
4,4'-DDE	mg/kg dry wt	0.077	0.186	0.39	0.114	0.157
2,4'-DDT	mg/kg dry wt	< 0.0010	0.0054	0.0052	0.0181	0.022
4,4'-DDT	mg/kg dry wt	0.0052	0.030	0.034	0.23	0.25
Total DDT Isomers	mg/kg dry wt	0.156	0.30	0.55	0.67	0.67
Dieldrin	mg/kg dry wt	0.0055	0.0090	0.025	0.0037	0.0082
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Sample Name:	JME 088 Deep 25-Mar-2022 9:02 am	JME 088 Shallow 25-Mar-2022 9:05 am	JME 087 Deep 25-Mar-2022 9:01 am	JME 087 Shallow 25-Mar-2022 9:00 am	JME 086 Deep 25-Mar-2022 8:56 am	
Lab Number:	2937698.21	2937698.22	2937698.23	2937698.24	2937698.25	
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	0.0033	< 0.0010	0.0045
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0176	0.0054	0.026	0.0011	0.0078
4,4'-DDD	mg/kg dry wt	0.063	0.0123	0.081	0.0035	0.022
2,4'-DDE	mg/kg dry wt	0.0031	< 0.0010	0.0051	< 0.0010	0.0038
4,4'-DDE	mg/kg dry wt	0.035	0.0107	0.039	0.0035	0.0196
2,4'-DDT	mg/kg dry wt	0.0017	0.0031	< 0.0010	< 0.0010	< 0.0010
4,4'-DDT	mg/kg dry wt	0.0139	0.0156	0.0069	0.0027	0.0021
Total DDT Isomers	mg/kg dry wt	0.134	0.047	0.159	0.012	0.055
Dieldrin	mg/kg dry wt	0.0020	0.0042	0.0140	< 0.0010	0.0067
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Sample Type: Sediment					
Sample Name:	JME 088 Deep 25-Mar-2022 9:02 am	JME 088 Shallow 25-Mar-2022 9:05 am	JME 087 Deep 25-Mar-2022 9:01 am	JME 087 Shallow 25-Mar-2022 9:00 am	JME 086 Deep 25-Mar-2022 8:56 am
Lab Number:	2937698.21	2937698.22	2937698.23	2937698.24	2937698.25
Organochlorine Pesticides Trace in Soil					
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Sample Name:	JME 086 Shallow 25-Mar-2022 8:55 am	East FCC new1 Deep (north) 25-Mar-2022 8:46 am	East FCC new1 Shallow (north) 25-Mar-2022 8:45 am	East FCC new2 Deep (south) 25-Mar-2022 9:11 am	East FCC new2 Shallow (south) 25-Mar-2022 9:10 am
Lab Number:	2937698.26	2937698.27	2937698.28	2937698.29	2937698.30
Organochlorine Pesticides Trace in Soil					
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	< 0.0010	0.0019	0.0011	0.0026
4,4'-DDD	mg/kg dry wt	0.0027	0.0039	0.0025	0.0073
2,4'-DDE	mg/kg dry wt	< 0.0010	0.0024	< 0.0010	0.0137
4,4'-DDE	mg/kg dry wt	0.0027	0.029	0.0047	0.26
2,4'-DDT	mg/kg dry wt	0.0024	0.0052	0.0021	0.021
4,4'-DDT	mg/kg dry wt	0.0052	0.028	0.0127	0.46
Total DDT Isomers	mg/kg dry wt	0.014	0.071	0.023	1.79
Dieldrin	mg/kg dry wt	< 0.0010	0.0014	< 0.0010	0.067
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Sample Name:	JME 090 Deep 25-Mar-2022 9:21 am	JME 090 Shallow 25-Mar-2022 9:20 am	Hunter Brown Deep (control) 25-Mar-2022 8:10 am	Hunter Brown Shallow (control) 25-Mar-2022 8:10 am	JME 082 Deep 25-Mar-2022 9:11 am
Lab Number:	2937698.31	2937698.32	2937698.33	2937698.34	2937698.35
Organochlorine Pesticides Trace in Soil					
Aldrin	mg/kg dry wt	0.0013	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.097	0.0040	< 0.0010	< 0.0010
4,4'-DDD	mg/kg dry wt	0.24	0.0111	< 0.0010	< 0.0010
2,4'-DDE	mg/kg dry wt	0.0091	< 0.0010	< 0.0010	< 0.0010
4,4'-DDE	mg/kg dry wt	0.136	0.0124	< 0.0010	0.0018
2,4'-DDT	mg/kg dry wt	0.0075	0.0022	< 0.0010	< 0.0010
4,4'-DDT	mg/kg dry wt	0.066	0.0131	< 0.0010	< 0.0010
Total DDT Isomers	mg/kg dry wt	0.55	0.043	< 0.006	< 0.006
Dieldrin	mg/kg dry wt	0.027	0.0039	< 0.0010	< 0.0010
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Sample Type: Sediment						
Sample Name:	JME 090 Deep 25-Mar-2022 9:21 am	JME 090 Shallow 25-Mar-2022 9:20 am	Hunter Brown Deep (control) 25-Mar-2022 8:10 am	Hunter Brown Shallow (control) 25-Mar-2022 8:10 am	JME 082 Deep 25-Mar-2022 9:11 am	
Lab Number:	2937698.31	2937698.32	2937698.33	2937698.34	2937698.35	
Organochlorine Pesticides Trace in Soil						
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Sample Name:	JME 082 Shallow 25-Mar-2022 9:10 am					
Lab Number:	2937698.36					

Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	-	-	-	-
alpha-BHC	mg/kg dry wt	< 0.0010	-	-	-	-
beta-BHC	mg/kg dry wt	< 0.0010	-	-	-	-
delta-BHC	mg/kg dry wt	< 0.0010	-	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	-	-	-	-
cis-Chlordane	mg/kg dry wt	< 0.0010	-	-	-	-
trans-Chlordane	mg/kg dry wt	< 0.0010	-	-	-	-
2,4'-DDD	mg/kg dry wt	0.0013	-	-	-	-
4,4'-DDD	mg/kg dry wt	0.0048	-	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.0010	-	-	-	-
4,4'-DDE	mg/kg dry wt	0.0082	-	-	-	-
2,4'-DDT	mg/kg dry wt	0.0010	-	-	-	-
4,4'-DDT	mg/kg dry wt	0.0027	-	-	-	-
Total DDT Isomers	mg/kg dry wt	0.019	-	-	-	-
Dieldrin	mg/kg dry wt	< 0.0010	-	-	-	-
Endosulfan I	mg/kg dry wt	< 0.0010	-	-	-	-
Endosulfan II	mg/kg dry wt	< 0.0010	-	-	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.0010	-	-	-	-
Endrin	mg/kg dry wt	< 0.0010	-	-	-	-
Endrin aldehyde	mg/kg dry wt	< 0.0010	-	-	-	-
Endrin ketone	mg/kg dry wt	< 0.0010	-	-	-	-
Heptachlor	mg/kg dry wt	< 0.0010	-	-	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.0010	-	-	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.0010	-	-	-	-
Methoxychlor	mg/kg dry wt	< 0.0010	-	-	-	-

Analyst's Comments

It has been noted that the replicate analyses for the OCP analysis on samples 2937698.19 and .20 showed greater variation than would normally be expected. This may reflect the heterogeneity of the samples. Averaged results have been reported. The original analysis indicated the presence of a prill. This has not been included in the averaged results.

Summary of Methods

The following table 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 analyses. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at HILL Laboratories, 20 Duke Street, Franklin, Hamilton L3Z 4A4.

Sample Type: Sediment			
Test	Method Description	Default Detection Limit	Sample No
Soil Prep Dry for Organics, Trace*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-36

Sample Type: Sediment			
Test	Method Description	Default Detection Limit	Sample No
Organochlorine Pesticides Trace in Soil	Sonication extraction, GC-ECD analysis. In-house based on US EPA 8081.	0.0010 - 0.006 mg/kg dry wt	1-36

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

Testing was completed between 11-Apr-2022 and 20-Apr-2022. 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.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Kim Harrison MSc
Client Services Manager - Environmental

Appendix 6. Biota data 2022



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

Page 1 of 2

Client:	Davidson Environmental Ltd	Lab No:	2935625	SPv1
Contact:	R Davidson	Date Received:	29-Mar-2022	
	C/- Davidson Environmental Ltd	Date Reported:	12-May-2022	
	6 Ngapua Place	Quote No:	91901	
	Atawhai	Order No:		
	Nelson 7010	Client Reference:		
		Submitted By:	R Davidson	

Sample Type: Shellfish						
Sample Name:		JME 080 Ampibola	JME 084 Ampibola	East FCC New 2 Diloma	East FCC Ampibola	East FCC Cockle
Lab Number:		2935625.1	2935625.2	2935625.3	2935625.4	2935625.5
Individual Tests						
Dry Matter	g/100g as rcvd	13.9	12.2	17.5	12.8	9.7
Organochlorine Pesticides in Biomatter						
Aldrin	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
alpha-BHC	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
beta-BHC	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
delta-BHC	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
gamma-BHC (Lindane)	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
cis-Chlordane	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
trans-Chlordane	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
2,4'-DDD	mg/kg	< 0.0005	0.0112	< 0.0005	0.0188	< 0.0005
4,4'-DDD	mg/kg	0.0030	0.033	0.0048	0.055	< 0.0005
2,4'-DDE	mg/kg	< 0.0005	0.0017	< 0.0005	0.0018	< 0.0005
4,4'-DDE	mg/kg	0.0153	0.29	0.0053	0.144	0.0005
2,4'-DDT	mg/kg	< 0.0005	< 0.0005	< 0.0005	0.0010	< 0.0005
4,4'-DDT	mg/kg	0.0016	0.0141	0.0021	0.029	< 0.0005
Dieldrin	mg/kg	0.0006	0.0089	0.0021	0.096	< 0.0005
Endosulfan I	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Endosulfan II	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Endosulfan sulfate	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Endrin	mg/kg	< 0.0005	< 0.0005	< 0.0005	0.0015	< 0.0005
Endrin aldehyde	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Endrin ketone	mg/kg	< 0.0005	< 0.0005	< 0.0005	0.0009	< 0.0005
Heptachlor	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Heptachlor epoxide	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Hexachlorobenzene	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Methoxychlor	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Sample Name:		East Control Cockle				
Lab Number:		2935625.6				
Individual Tests						
Dry Matter	g/100g as rcvd	9.6	-	-	-	-
Organochlorine Pesticides in Biomatter						
Aldrin	mg/kg	< 0.0005	-	-	-	-
alpha-BHC	mg/kg	< 0.0005	-	-	-	-
beta-BHC	mg/kg	< 0.0005	-	-	-	-
delta-BHC	mg/kg	< 0.0005	-	-	-	-
gamma-BHC (Lindane)	mg/kg	< 0.0005	-	-	-	-
cis-Chlordane	mg/kg	< 0.0005	-	-	-	-
trans-Chlordane	mg/kg	< 0.0005	-	-	-	-
2,4'-DDD	mg/kg	< 0.0005	-	-	-	-

Sample Type: Shellfish						
Sample Name:		East Control Cockle				
Lab Number:		2935625.6				
Organochlorine Pesticides in Biomatter						
4,4'-DDD	mg/kg	< 0.0005	-	-	-	-
2,4'-DDE	mg/kg	< 0.0005	-	-	-	-
4,4'-DDE	mg/kg	< 0.0005	-	-	-	-
2,4'-DDT	mg/kg	< 0.0005	-	-	-	-
4,4'-DDT	mg/kg	< 0.0005	-	-	-	-
Dieldrin	mg/kg	< 0.0005	-	-	-	-
Endosulfan I	mg/kg	< 0.0005	-	-	-	-
Endosulfan II	mg/kg	< 0.0005	-	-	-	-
Endosulfan sulfate	mg/kg	< 0.0005	-	-	-	-
Endrin	mg/kg	< 0.0005	-	-	-	-
Endrin aldehyde	mg/kg	< 0.0005	-	-	-	-
Endrin ketone	mg/kg	< 0.0005	-	-	-	-
Heptachlor	mg/kg	< 0.0005	-	-	-	-
Heptachlor epoxide	mg/kg	< 0.0005	-	-	-	-
Hexachlorobenzene	mg/kg	< 0.0005	-	-	-	-
Methoxychlor	mg/kg	< 0.0005	-	-	-	-

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: Shellfish			
Test	Method Description	Default Detection Limit	Sample No
Shucking of Shellfish	Removal of tissue from shell.	-	1-6
Homogenise	Mincing, chopping, or blending of sample to form homogenous sample fraction.	-	1-6
Dry Matter	Drying for 16 hours at 103°C, gravimetry. AOAC 945.15, 19th Edition.	0.10 g/100g as rcvd	1-6
Organochlorine Pesticides in Biomatter	Sonication extraction, GC-ECD analysis. In-house based on US EPA 8081.	0.0005 mg/kg	1-6

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

Testing was completed between 12-Apr-2022 and 11-May-2022. 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.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Ara Heron BSc (Tech)
Client Services Manager - Environmental

Appendix 7. Sediment data 2019



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

Page 1 of 6

Client:	Davidson Environmental Ltd	Lab No:	2138931	SPV1
Contact:	R Davidson	Date Received:	09-Mar-2019	
	C/- Davidson Environmental Ltd	Date Reported:	22-Mar-2019	
	PO Box 958	Quote No:	91901	
	Nelson 7040	Order No:		
		Client Reference:	Mapua samples	
		Submitted By:	R Davidson	

Sample Type: Sediment						
Sample Name:	JME 080 West Control (Shallow) 07-Mar-2019 3:20 pm	JME 080 West Control (Deep) 07-Mar-2019 3:22 pm	JME 083 (Shallow) 07-Mar-2019 2:54 pm	JME 083 (Deep) 07-Mar-2019 2:55 pm	JME 081 (Shallow) 07-Mar-2019 2:57 pm	
Lab Number:	2138931.1	2138931.2	2138931.3	2138931.4	2138931.5	
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	0.0012	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	0.0014	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	< 0.0010	< 0.0010	0.036	0.107	0.0024
4,4'-DDD	mg/kg dry wt	< 0.0010	< 0.0010	0.091	0.28	0.0073
2,4'-DDE	mg/kg dry wt	< 0.0010	< 0.0010	0.0136	0.046	< 0.0010
4,4'-DDE	mg/kg dry wt	< 0.0010	< 0.0010	0.092	0.28	0.0082
2,4'-DDT	mg/kg dry wt	< 0.0010	< 0.0010	0.0035	0.0055	< 0.0010
4,4'-DDT	mg/kg dry wt	0.0015	< 0.0010	0.0147	0.028	0.0032
Total DDT Isomers	mg/kg dry wt	< 0.006	< 0.006	0.25	0.75	0.021
Dieldrin	mg/kg dry wt	< 0.0010	< 0.0010	0.0048	0.0098	< 0.0010
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sample Name:	JME 081 (Deep) 07-Mar-2019 2:58 pm	JME 082 (Shallow) 07-Mar-2019 3:01 pm	JME 082 (Deep) 07-Mar-2019 3:02 pm	West FCC New 1 (West) (Shallow) 07-Mar-2019 2:40 pm	West FCC New 1 (West) (Deep) 07-Mar-2019 2:42 pm	
Lab Number:	2138931.6	2138931.7	2138931.8	2138931.9	2138931.10	
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010



IANZ
ACCREDITED LABORATORY

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked *, which are not accredited.

Sample Type: Sediment						
Sample Name:	JME 081 (Deep) 07-Mar-2019 2:58 pm	JME 082 (Shallow) 07-Mar-2019 3:01 pm	JME 082 (Deep) 07-Mar-2019 3:02 pm	West FCC New 1 (West) (Shallow) 07-Mar-2019 2:40 pm	West FCC New 1 (West) (Deep) 07-Mar-2019 2:42 pm	
Lab Number:	2138931.6	2138931.7	2138931.8	2138931.9	2138931.10	
Organochlorine Pesticides Trace in Soil						
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0053	0.0014	0.0032	0.0091	< 0.0010
4,4'-DDD	mg/kg dry wt	0.0152	0.0044	0.0081	0.0099	0.0013
2,4'-DDE	mg/kg dry wt	0.0023	< 0.0010	0.0019	0.0056	< 0.0010
4,4'-DDE	mg/kg dry wt	0.021	0.0060	0.021	0.061	0.0048
2,4'-DDT	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
4,4'-DDT	mg/kg dry wt	0.0077	0.0010	0.0017	0.0129	0.0013
Total DDT Isomers	mg/kg dry wt	0.052	0.013	0.035	0.098	0.007
Dieldrin	mg/kg dry wt	< 0.0010	0.0026	< 0.0010	< 0.0010	< 0.0010
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

Sample Name:	West FCC New 2 (Middle) (Shallow) 07-Mar-2019 2:44 pm	West FCC New 2 (Middle) (Deep) 07-Mar-2019 2:46 pm	West FCC New 3 (East) (Shallow) 07-Mar-2019 2:49 pm	West FCC New 3 (East) (Deep) 07-Mar-2019 2:50 pm	JME 084 (Shallow) 07-Mar-2019 3:08 pm	
Lab Number:	2138931.11	2138931.12	2138931.13	2138931.14	2138931.15	
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0085	0.0073	< 0.0010	< 0.0010	0.0014
4,4'-DDD	mg/kg dry wt	0.0138	0.0106	0.0018	0.0033	0.0040
2,4'-DDE	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
4,4'-DDE	mg/kg dry wt	0.024	0.0124	0.0036	0.0041	0.0080
2,4'-DDT	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
4,4'-DDT	mg/kg dry wt	0.0022	0.0116	< 0.0010	< 0.0010	0.0022
Total DDT Isomers	mg/kg dry wt	0.048	0.042	< 0.006	0.007	0.016
Dieldrin	mg/kg dry wt	< 0.0010	0.0011	< 0.0010	< 0.0010	< 0.0010
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Sample Type: Sediment						
Sample Name:		West FCC New 2 (Middle) (Shallow) 07-Mar-2019 2:44 pm	West FCC New 2 (Middle) (Deep) 07-Mar-2019 2:46 pm	West FCC New 3 (East) (Shallow) 07-Mar-2019 2:49 pm	West FCC New 3 (East) (Deep) 07-Mar-2019 2:50 pm	JME 084 (Shallow) 07-Mar-2019 3:08 pm
Lab Number:		2138931.11	2138931.12	2138931.13	2138931.14	2138931.15
Organochlorine Pesticides Trace in Soil						
Total Chlordane [(cis+trans)* 100/42]		mg/kg dry wt	< 0.002	< 0.002	< 0.002	< 0.002
Sample Name:		JME 084 (Deep) 07-Mar-2019 3:09 pm	West FCC Stream (Lower) (Shallow) 07-Mar-2019 2:24 pm	West FCC Stream (Lower) (Deep) 07-Mar-2019	West FCC Stream (Middle) (Shallow) 07-Mar-2019 2:19 pm	West FCC Stream (Middle) (Deep) 07-Mar-2019 2:22 pm
Lab Number:		2138931.16	2138931.17	2138931.18	2138931.19	2138931.20
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	0.0013	0.0014	0.0033
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	0.0011	0.0021
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.056	0.023	0.040	0.192	0.44
4,4'-DDD	mg/kg dry wt	0.062	0.055	0.096	0.47	1.09
2,4'-DDE	mg/kg dry wt	0.0059	0.0089	0.0173	0.091	0.23
4,4'-DDE	mg/kg dry wt	0.160	0.094	0.21	0.77	1.42
2,4'-DDT	mg/kg dry wt	0.0012	0.0015	0.0020	0.0129	0.035
4,4'-DDT	mg/kg dry wt	0.0031	0.0055	0.0090	0.051	0.155
Total DDT Isomers	mg/kg dry wt	0.29	0.188	0.37	1.59	3.4
Dieldrin	mg/kg dry wt	0.0105	0.0076	0.0154	0.085	0.105
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sample Name:		West FCC Stream (Upper) (Shallow) 07-Mar-2019 2:15 pm	West FCC Stream (Upper) (Deep) 07-Mar-2019 2:16 pm	JME 088 (Shallow) 07-Mar-2019 4:36 pm	JME 088 (Deep) 07-Mar-2019 4:38 pm	JME 087 (Shallow) 07-Mar-2019 4:34 pm
Lab Number:		2138931.21	2138931.22	2138931.23	2138931.24	2138931.25
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	0.0019	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.071	0.22	0.0049	0.0081	0.0016
4,4'-DDD	mg/kg dry wt	0.170	0.59	0.0127	0.023	0.0038
2,4'-DDE	mg/kg dry wt	0.027	0.076	< 0.0010	< 0.0010	< 0.0010
4,4'-DDE	mg/kg dry wt	0.23	0.27	0.0100	0.0121	0.0054
2,4'-DDT	mg/kg dry wt	0.0035	0.0025	0.0040	< 0.0010	0.0030

Sample Type: Sediment						
Sample Name:	West FCC Stream (Upper) (Shallow) 07-Mar-2019 2:15 pm	West FCC Stream (Upper) (Deep) 07-Mar-2019 2:16 pm	JME 088 (Shallow) 07-Mar-2019 4:36 pm	JME 088 (Deep) 07-Mar-2019 4:38 pm	JME 087 (Shallow) 07-Mar-2019 4:34 pm	
Lab Number:	2138931.21	2138931.22	2138931.23	2138931.24	2138931.25	
Organochlorine Pesticides Trace in Soil						
4,4'-DDT	mg/kg dry wt	0.0104	0.0070	0.0125	0.0094	0.0082
Total DDT Isomers	mg/kg dry wt	0.52	1.18	0.044	0.053	0.022
Dieldrin	mg/kg dry wt	0.032	0.025	0.0019	0.0015	0.0031
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

Sample Name:	JME 087 (Deep) 07-Mar-2019 4:35 pm	JME 086 (Shallow) 07-Mar-2019 4:29 pm	JME 086 (Deep) 07-Mar-2019 4:30 pm	East FCC New 1 (North) (Shallow) 07-Mar-2019 4:39 pm	East FCC New 1 (North) (Deep) 07-Mar-2019 4:40 pm	
Lab Number:	2138931.26	2138931.27	2138931.28	2138931.29	2138931.30	
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	0.0138	< 0.0010	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0070	< 0.0010	0.0020	0.0060	0.0176
4,4'-DDD	mg/kg dry wt	0.022	0.0017	0.0042	0.0135	0.104
2,4'-DDE	mg/kg dry wt	< 0.0010	< 0.0010	0.0011	< 0.0010	0.0019
4,4'-DDE	mg/kg dry wt	0.0090	0.0020	0.0055	0.0136	0.036
2,4'-DDT	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	0.0058	0.039
4,4'-DDT	mg/kg dry wt	0.0033	0.0024	0.0011	0.0193	0.097
Total DDT Isomers	mg/kg dry wt	0.041	0.006	0.014	0.058	0.30
Dieldrin	mg/kg dry wt	0.084	< 0.0010	< 0.0010	0.0010	0.0035
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

Sample Name:	East FCC New 2 (South) (Shallow) 07-Mar-2019 4:23 pm	East FCC New 2 (South) (Deep) 07-Mar-2019 4:26 pm	JME 090 (Shallow) 07-Mar-2019 4:20 pm	JME 090 (Deep) 07-Mar-2019 4:22 pm	Hunter-Brown (Control) (Shallow) 07-Mar-2019 5:34 pm	
Lab Number:	2138931.31	2138931.32	2138931.33	2138931.34	2138931.35	

Sample Type: Sediment						
Sample Name:		East FCC New 2 (South) (Shallow) 07-Mar-2019 4:23 pm	East FCC New 2 (South) (Deep) 07-Mar-2019 4:26 pm	JME 090 (Shallow) 07-Mar-2019 4:20 pm	JME 090 (Deep) 07-Mar-2019 4:22 pm	Hunter-Brown (Control) (Shallow) 07-Mar-2019 5:34 pm
Lab Number:		2138931.31	2138931.32	2138931.33	2138931.34	2138931.35
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	0.0019	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	0.0013	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0027	0.21	0.0045	0.0154	< 0.0010
4,4'-DDD	mg/kg dry wt	0.0088	0.70	0.0133	0.051	< 0.0010
2,4'-DDE	mg/kg dry wt	< 0.0010	0.0139	< 0.0010	0.0011	< 0.0010
4,4'-DDE	mg/kg dry wt	0.0054	0.194	0.0096	0.023	< 0.0010
2,4'-DDT	mg/kg dry wt	0.0011	0.134	0.0041	0.021	< 0.0010
4,4'-DDT	mg/kg dry wt	0.0046	0.95	0.032	0.166	< 0.0010
Total DDT Isomers	mg/kg dry wt	0.023	2.2	0.064	0.28	< 0.006
Dieldrin	mg/kg dry wt	< 0.0010	0.029	0.0011	0.0027	< 0.0010
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

Sample Name:		Hunter-Brown (Control) (Deep) 07-Mar-2019 5:32 pm				
Lab Number:		2138931.36				
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	-	-	-	-
alpha-BHC	mg/kg dry wt	< 0.0010	-	-	-	-
beta-BHC	mg/kg dry wt	< 0.0010	-	-	-	-
delta-BHC	mg/kg dry wt	< 0.0010	-	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	-	-	-	-
cis-Chlordane	mg/kg dry wt	< 0.0010	-	-	-	-
trans-Chlordane	mg/kg dry wt	< 0.0010	-	-	-	-
2,4'-DDD	mg/kg dry wt	< 0.0010	-	-	-	-
4,4'-DDD	mg/kg dry wt	< 0.0010	-	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.0010	-	-	-	-
4,4'-DDE	mg/kg dry wt	< 0.0010	-	-	-	-
2,4'-DDT	mg/kg dry wt	< 0.0010	-	-	-	-
4,4'-DDT	mg/kg dry wt	< 0.0010	-	-	-	-
Total DDT Isomers	mg/kg dry wt	< 0.006	-	-	-	-
Dieldrin	mg/kg dry wt	< 0.0010	-	-	-	-
Endosulfan I	mg/kg dry wt	< 0.0010	-	-	-	-
Endosulfan II	mg/kg dry wt	< 0.0010	-	-	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.0010	-	-	-	-
Endrin	mg/kg dry wt	< 0.0010	-	-	-	-
Endrin aldehyde	mg/kg dry wt	< 0.0010	-	-	-	-

Sample Type: Sediment						
Sample Name:		Hunter-Brown (Control) (Deep) 07-Mar-2019 5:32 pm				
Lab Number:		2138931.36				
Organochlorine Pesticides Trace in Soil						
Endrin ketone	mg/kg dry wt	< 0.0010	-	-	-	-
Heptachlor	mg/kg dry wt	< 0.0010	-	-	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.0010	-	-	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.0010	-	-	-	-
Methoxychlor	mg/kg dry wt	< 0.0010	-	-	-	-
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.002	-	-	-	-

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. 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
Soil Prep Dry for Organics, Trace*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-36
Organochlorine Pesticides Trace in Soil	Sonication extraction, SPE cleanup, GPC cleanup (if required), dual column GC-ECD analysis. Tested on dried sample	0.0010 - 0.006 mg/kg dry wt	1-36

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

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

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

Ara Heron BSc (Tech)
Client Services Manager - Environmental

Appendix 8. Invertebrate data 2019



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

Page 1 of 3

Client:	Davidson Environmental Ltd	Lab No:	2138930	SPv1
Contact:	R Davidson	Date Received:	09-Mar-2019	
	C/- Davidson Environmental Ltd	Date Reported:	25-Mar-2019	
	PO Box 958	Quote No:	91901	
	Nelson 7040	Order No:		
		Client Reference:	Mapua FCC	
		Submitted By:	R Davidson	

Sample Type: Shellfish						
Sample Name:	West Control JME 080 07-Mar-2019	JME 084 07-Mar-2019	East FCC Diloma Soft 07-Mar-2019	East FCC Amphibola 07-Mar-2019	East FCC Cockle 07-Mar-2019	
Lab Number:	2138930.1	2138930.2	2138930.3	2138930.4	2138930.5	
Individual Tests						
Dry Matter	g/100g as rcvd	14.0	13.8	-	12.0	10.3
Organochlorine Pesticides in Biomatter						
Aldrin	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
alpha-BHC	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
beta-BHC	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
delta-BHC	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
gamma-BHC (Lindane)	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
cis-Chlordane	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
trans-Chlordane	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
2,4'-DDD	mg/kg	0.0006	0.064	0.0007	0.025	< 0.0005
4,4'-DDD	mg/kg	0.0027	0.113	0.0053	0.082	< 0.0005
2,4'-DDE	mg/kg	< 0.0005	0.0066	< 0.0005	0.0008	< 0.0005
4,4'-DDE	mg/kg	0.0139	0.93	0.0052	0.130	< 0.0005
2,4'-DDT	mg/kg	< 0.0005	0.0006	< 0.0005	0.0013	< 0.0005
4,4'-DDT	mg/kg	0.0019	0.023	0.0020	0.023	< 0.0005
Dieldrin	mg/kg	< 0.0005	0.029	0.0015	0.068	< 0.0005
Endosulfan I	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Endosulfan II	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Endosulfan sulfate	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Endrin	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Endrin aldehyde	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Endrin ketone	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Heptachlor	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Heptachlor epoxide	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Hexachlorobenzene	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Methoxychlor	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Total Chlordane [(cis+trans)*100/42]	mg/kg	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sample Name:	Hunter-Brown Control 07-Mar-2019					
Lab Number:	2138930.6					
Individual Tests						
Dry Matter	g/100g as rcvd	9.2	-	-	-	-

Sample Type: Shellfish						
Sample Name:		Hunter-Brown Control				
Lab Number:		2138930.6				
Organochlorine Pesticides in Biomatter						
Aldrin	mg/kg	< 0.0005	-	-	-	-
alpha-BHC	mg/kg	< 0.0005	-	-	-	-
beta-BHC	mg/kg	< 0.0005	-	-	-	-
delta-BHC	mg/kg	< 0.0005	-	-	-	-
gamma-BHC (Lindane)	mg/kg	< 0.0005	-	-	-	-
cis-Chlordane	mg/kg	< 0.0005	-	-	-	-
trans-Chlordane	mg/kg	< 0.0005	-	-	-	-
2,4'-DDD	mg/kg	< 0.0005	-	-	-	-
4,4'-DDD	mg/kg	< 0.0005	-	-	-	-
2,4'-DDE	mg/kg	< 0.0005	-	-	-	-
4,4'-DDE	mg/kg	< 0.0005	-	-	-	-
2,4'-DDT	mg/kg	< 0.0005	-	-	-	-
4,4'-DDT	mg/kg	< 0.0005	-	-	-	-
Dieldrin	mg/kg	< 0.0005	-	-	-	-
Endosulfan I	mg/kg	< 0.0005	-	-	-	-
Endosulfan II	mg/kg	< 0.0005	-	-	-	-
Endosulfan sulfate	mg/kg	< 0.0005	-	-	-	-
Endrin	mg/kg	< 0.0005	-	-	-	-
Endrin aldehyde	mg/kg	< 0.0005	-	-	-	-
Endrin ketone	mg/kg	< 0.0005	-	-	-	-
Heptachlor	mg/kg	< 0.0005	-	-	-	-
Heptachlor epoxide	mg/kg	< 0.0005	-	-	-	-
Hexachlorobenzene	mg/kg	< 0.0005	-	-	-	-
Methoxychlor	mg/kg	< 0.0005	-	-	-	-
Total Chlordane [(cis+trans)*100/42]	mg/kg	< 0.002	-	-	-	-

Analyst's Comments

It should be noted that there was insufficient sample for 2138930.3 (East FCC Diloma Soft) to complete the dry matter analysis.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Shellfish			
Test	Method Description	Default Detection Limit	Sample No
Homogenisation of Biological samples for Organics Tests	Mincing, chopping, or blending of sample to form homogenous sample fraction.	-	1-6
Shucking of Shellfish	Removal of tissue from shell.	-	1-6
Homogenise	Mincing, chopping, or blending of sample to form homogenous sample fraction.	-	1-6
Dry Matter	Drying for minimum of 24 hours at 65°C, gravimetry. Fact Sheet No 2.3.2-14, A Compendium of Chemical, Physical and Biological Methods for Assessing and Monitoring the Remediation of Contaminated Sediment Sites, 2003.	0.10 g/100g as rcvd	1-2, 4-6
Organochlorine Pesticides in Biomatter	Sonication extraction, alumina cleanup, GPC cleanup, dual column GC-ECD analysis	0.0005 - 0.002 mg/kg	1-6

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

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

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

A handwritten signature in blue ink, appearing to read 'G Corban', is positioned above the printed name.

Graham Corban MSc Tech (Hons)
Client Services Manager - Environmental

Appendix 9. Sediment data 2018



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

Page 1 of 6

Client:	Davidson Environmental Ltd	Lab No:	1991748	SPv1
Contact:	R Davidson C/- Davidson Environmental Ltd PO Box 958 Nelson 7040	Date Received:	30-May-2018	
		Date Reported:	25-Jun-2018	
		Quote No:	91901	
		Order No:		
		Client Reference:	Mapua	
		Submitted By:	R Davidson	

Sample Type: Sediment

Sample Name:	West Control JME 080 Shallow 28-May-2018 11:57 am	West Control JME 080 Deep 28-May-2018 11:57 am	JME 083 Shallow 28-May-2018 12:29 am	JME 083 Deep 28-May-2018 12:29 am	JME 081 Shallow 28-May-2018 12:25 am
Lab Number:	1991748.1	1991748.2	1991748.3	1991748.4	1991748.5
Organochlorine Pesticides Trace in Soil					
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	< 0.0010	< 0.0010	0.0047	0.044
4,4'-DDD	mg/kg dry wt	< 0.0010	< 0.0010	0.0073	0.032
2,4'-DDE	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	0.0081
4,4'-DDE	mg/kg dry wt	< 0.0010	0.0020	0.021	0.153
2,4'-DDT	mg/kg dry wt	< 0.0010	< 0.0010	0.0012	0.021
4,4'-DDT	mg/kg dry wt	< 0.0010	< 0.0010	0.0168	0.182
Total DDT Isomers	mg/kg dry wt	< 0.006	< 0.006	0.051	0.44
Dieldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	0.0144
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.002	< 0.002	< 0.002	0.002

Sample Name:	JME 081 Deep 28-May-2018 12:26 am	JME 082 Shallow 28-May-2018 12:17 am	JME 082 Deep 28-May-2018 12:18 am	West FCC New 1 Shallow 28-May-2018 12:48 am	West FCC New 1 Deep 28-May-2018 12:49 am
Lab Number:	1991748.6	1991748.7	1991748.8	1991748.9	1991748.10
Organochlorine Pesticides Trace in Soil					
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010



IANZ
ACCREDITED LABORATORY

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked *, which are not accredited.

Sample Type: Sediment						
Sample Name:	JME 081 Deep 28-May-2018 12:26 am	JME 082 Shallow 28-May-2018 12:17 am	JME 082 Deep 28-May-2018 12:18 am	West FCC New 1 Shallow 28-May-2018 12:48 am	West FCC New 1 Deep 28-May-2018 12:49 am	
Lab Number:	1991748.6	1991748.7	1991748.8	1991748.9	1991748.10	
Organochlorine Pesticides Trace in Soil						
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0143	< 0.0010	< 0.0010	0.0069	0.0106
4,4'-DDD	mg/kg dry wt	0.030	0.0037	0.0011	0.0137	0.029
2,4'-DDE	mg/kg dry wt	0.0057	< 0.0010	< 0.0010	0.0067	0.0049
4,4'-DDE	mg/kg dry wt	0.049	0.0060	0.0063	0.047	0.048
2,4'-DDT	mg/kg dry wt	0.0036	< 0.0010	< 0.0010	0.0033	< 0.0010
4,4'-DDT	mg/kg dry wt	0.020	0.0027	0.0021	0.0107	0.0055
Total DDT Isomers	mg/kg dry wt	0.122	0.012	0.010	0.088	0.097
Dieldrin	mg/kg dry wt	0.0039	< 0.0010	< 0.0010	0.0028	0.0019
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

Sample Name:	West FCC New 2 Shallow 28-May-2018 12:52 am	West FCC New 2 Deep 28-May-2018 12:54 am	West FCC New 3 Shallow 28-May-2018 12:57 am	West FCC New 3 Deep 28-May-2018 12:58 am	JME 084 Shallow 28-May-2018 12:36 am	
Lab Number:	1991748.11	1991748.12	1991748.13	1991748.14	1991748.15	
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0088	0.0147	0.0013	< 0.0010	0.0027
4,4'-DDD	mg/kg dry wt	0.021	0.032	0.0028	0.0024	0.0069
2,4'-DDE	mg/kg dry wt	0.0020	0.0022	< 0.0010	< 0.0010	< 0.0010
4,4'-DDE	mg/kg dry wt	0.037	0.054	0.0069	0.0062	0.0115
2,4'-DDT	mg/kg dry wt	0.0027	< 0.0010	< 0.0010	< 0.0010	< 0.0010
4,4'-DDT	mg/kg dry wt	0.0101	0.0062	0.0015	< 0.0010	0.0018
Total DDT Isomers	mg/kg dry wt	0.082	0.110	0.012	0.009	0.023
Dieldrin	mg/kg dry wt	0.0012	0.0014	< 0.0010	< 0.0010	< 0.0010
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Sample Type: Sediment						
Sample Name:		West FCC New 2 Shallow 28-May-2018 12:52 am	West FCC New 2 Deep 28-May-2018 12:54 am	West FCC New 3 Shallow 28-May-2018 12:57 am	West FCC New 3 Deep 28-May-2018 12:58 am	JME 084 Shallow 28-May-2018 12:36 am
Lab Number:		1991748.11	1991748.12	1991748.13	1991748.14	1991748.15
Organochlorine Pesticides Trace in Soil						
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sample Name:		JME 084 Deep 28-May-2018 12:37 am	West FCC Stream 1 Shallow 28-May-2018 1:04 pm	West FCC Stream 1 Deep 28-May-2018 1:05 pm	West FCC Stream 2 Shallow 28-May-2018 1:09 pm	West FCC Stream 2 Deep 28-May-2018 1:10 pm
Lab Number:		1991748.16	1991748.17	1991748.18	1991748.19	1991748.20
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	0.0043
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	0.0013	< 0.0010	< 0.0010	< 0.0010	0.0043
cis-Chlordane	mg/kg dry wt	0.0015	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.041	0.029	0.034	0.099	0.71
4,4'-DDD	mg/kg dry wt	0.056	0.077	0.089	0.26	2.0
2,4'-DDE	mg/kg dry wt	0.0080	0.0103	0.0127	0.042	0.35
4,4'-DDE	mg/kg dry wt	0.154	0.133	0.175	0.45	2.6
2,4'-DDT	mg/kg dry wt	0.0012	0.0028	0.0032	0.0114	0.060
4,4'-DDT	mg/kg dry wt	0.0032	0.0099	0.0128	0.044	0.26
Total DDT Isomers	mg/kg dry wt	0.26	0.26	0.33	0.91	6.0
Dieldrin	mg/kg dry wt	0.0101	0.0131	0.0121	0.061	0.136
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	0.006	< 0.002	< 0.002	< 0.002	< 0.002
Sample Name:		West FCC Stream 3 (upper) Shallow 28-May-2018 1:14 pm	West FCC Stream 3 (upper) Deep 28-May-2018 1:15 pm	JME 088 Shallow 28-May-2018 2:44 pm	JME 088 Deep 28-May-2018 2:45 pm	JME 087 Shallow 28-May-2018 2:58 pm
Lab Number:		1991748.21	1991748.22	1991748.23	1991748.24	1991748.25
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	0.0011	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	0.0011	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0170	0.099	0.0069	0.0168	0.0021
4,4'-DDD	mg/kg dry wt	0.045	0.28	0.0135	0.041	0.0042
2,4'-DDE	mg/kg dry wt	0.0047	0.031	< 0.0010	< 0.0010	< 0.0010
4,4'-DDE	mg/kg dry wt	0.069	0.29	0.0074	0.028	0.0038
2,4'-DDT	mg/kg dry wt	0.0030	0.0035	0.0121	0.0016	0.0030
4,4'-DDT	mg/kg dry wt	0.0089	0.0140	0.032	0.050	0.0134

Sample Type: Sediment						
Sample Name:		West FCC Stream 3 (upper) Shallow 28-May-2018 1:14 pm	West FCC Stream 3 (upper) Deep 28-May-2018 1:15 pm	JME 088 Shallow 28-May-2018 2:44 pm	JME 088 Deep 28-May-2018 2:45 pm	JME 087 Shallow 28-May-2018 2:58 pm
Lab Number:		1991748.21	1991748.22	1991748.23	1991748.24	1991748.25
Organochlorine Pesticides Trace in Soil						
Total DDT Isomers	mg/kg dry wt	0.147	0.72	0.072	0.137	0.027
Dieldrin	mg/kg dry wt	0.0167	0.069	0.0083	0.0029	< 0.0010
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.002	0.005	< 0.002	< 0.002	< 0.002
Sample Name:		JME 087 Deep 28-May-2018 2:50 pm	JME 086 Shallow 28-May-2018 2:52 pm	JME 086 Deep 28-May-2018 2:53 pm	East FCC New 1 Shallow 28-May-2018 2:57 pm	East FCC New 1 Deep 28-May-2018 2:56 pm
Lab Number:		1991748.26	1991748.27	1991748.28	1991748.29	1991748.30
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	< 0.0010	0.0013	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0037	0.0011	0.0051	0.0083	0.021
4,4'-DDD	mg/kg dry wt	0.0086	0.0065	0.0117	0.0198	0.052
2,4'-DDE	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	0.0021
4,4'-DDE	mg/kg dry wt	0.0059	0.0016	0.0052	0.0162	0.051
2,4'-DDT	mg/kg dry wt	0.0049	0.0014	< 0.0010	0.0131	0.0197
4,4'-DDT	mg/kg dry wt	0.025	0.0134	0.0026	0.055	0.100
Total DDT Isomers	mg/kg dry wt	0.049	0.024	0.025	0.112	0.25
Dieldrin	mg/kg dry wt	< 0.0010	< 0.0010	0.0027	0.0014	0.0029
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sample Name:		East FCC New 2 Shallow 28-May-2018 2:39 pm	East FCC New 2 Deep 28-May-2018 2:40 pm	Hunter-Brown Shallow 28-May-2018 4:05 pm	Hunter-Brown Deep 28-May-2018 4:07 pm	JME 090 Shallow 28-May-2018 2:35 am
Lab Number:		1991748.31	1991748.32	1991748.33	1991748.34	1991748.35

Sample Type: Sediment						
Sample Name:		East FCC New 2 Shallow 28-May-2018 2:39 pm	East FCC New 2 Deep 28-May-2018 2:40 pm	Hunter-Brown Shallow 28-May-2018 4:05 pm	Hunter-Brown Deep 28-May-2018 4:07 pm	JME 090 Shallow 28-May-2018 2:35 am
Lab Number:		1991748.31	1991748.32	1991748.33	1991748.34	1991748.35
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	0.0014	< 0.0010	< 0.0010	< 0.0010
alpha-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
beta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
delta-BHC	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-Chlordane	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2,4'-DDD	mg/kg dry wt	0.0028	0.148	< 0.0010	< 0.0010	0.0189
4,4'-DDD	mg/kg dry wt	0.0074	0.38	< 0.0010	< 0.0010	0.047
2,4'-DDE	mg/kg dry wt	< 0.0010	0.0133	< 0.0010	< 0.0010	< 0.0010
4,4'-DDE	mg/kg dry wt	0.0076	0.23	< 0.0010	< 0.0010	0.0114
2,4'-DDT	mg/kg dry wt	0.0054	0.037	< 0.0010	< 0.0010	0.020
4,4'-DDT	mg/kg dry wt	0.0192	0.29	< 0.0010	< 0.0010	0.071
Total DDT Isomers	mg/kg dry wt	0.042	1.10	< 0.006	< 0.006	0.168
Dieldrin	mg/kg dry wt	< 0.0010	0.043	< 0.0010	< 0.0010	0.0016
Endosulfan I	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan II	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endosulfan sulphate	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin aldehyde	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Endrin ketone	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Heptachlor epoxide	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobenzene	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methoxychlor	mg/kg dry wt	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sample Name:		JME 090 Deep 28-May-2018 2:36 pm				
Lab Number:		1991748.36				
Organochlorine Pesticides Trace in Soil						
Aldrin	mg/kg dry wt	< 0.0010	-	-	-	-
alpha-BHC	mg/kg dry wt	< 0.0010	-	-	-	-
beta-BHC	mg/kg dry wt	< 0.0010	-	-	-	-
delta-BHC	mg/kg dry wt	< 0.0010	-	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.0010	-	-	-	-
cis-Chlordane	mg/kg dry wt	< 0.0010	-	-	-	-
trans-Chlordane	mg/kg dry wt	< 0.0010	-	-	-	-
2,4'-DDD	mg/kg dry wt	0.033	-	-	-	-
4,4'-DDD	mg/kg dry wt	0.089	-	-	-	-
2,4'-DDE	mg/kg dry wt	0.0017	-	-	-	-
4,4'-DDE	mg/kg dry wt	0.028	-	-	-	-
2,4'-DDT	mg/kg dry wt	0.0038	-	-	-	-
4,4'-DDT	mg/kg dry wt	0.035	-	-	-	-
Total DDT Isomers	mg/kg dry wt	0.191	-	-	-	-
Dieldrin	mg/kg dry wt	0.0019	-	-	-	-
Endosulfan I	mg/kg dry wt	< 0.0010	-	-	-	-
Endosulfan II	mg/kg dry wt	< 0.0010	-	-	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.0010	-	-	-	-
Endrin	mg/kg dry wt	< 0.0010	-	-	-	-
Endrin aldehyde	mg/kg dry wt	< 0.0010	-	-	-	-
Endrin ketone	mg/kg dry wt	< 0.0010	-	-	-	-
Heptachlor	mg/kg dry wt	< 0.0010	-	-	-	-

Sample Type: Sediment						
Sample Name:		JME 090 Deep 28-May-2018 2:36 pm				
Lab Number:		1991748.36				
Organochlorine Pesticides Trace in Soil						
Heptachlor epoxide	mg/kg dry wt	< 0.0010	-	-	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.0010	-	-	-	-
Methoxychlor	mg/kg dry wt	< 0.0010	-	-	-	-
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.002	-	-	-	-

Summary of Methods

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

Sample Type: Sediment			
Test	Method Description	Default Detection Limit	Sample No
Organochlorine Pesticides Trace in Soil	Sonication extraction, SPE cleanup, GPC cleanup (if required), dual column GC-ECD analysis. Tested on dried sample	0.0010 - 0.006 mg/kg dry wt	1-36

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

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

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Graham Corban MSc Tech (Hons)
Client Services Manager - Environmental

Appendix 10. Invertebrate data 2018



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

Page 1 of 2

Client:	Davidson Environmental Ltd	Lab No:	1991753	SPv1
Contact:	R Davidson	Date Received:	30-May-2018	
	C/- Davidson Environmental Ltd	Date Reported:	06-Jul-2018	
	PO Box 958	Quote No:	91901	
	Nelson 7040	Order No:		
		Client Reference:		
		Submitted By:	R Davidson	

Sample Type: Shellfish						
Sample Name:	West Control JME 080 (Amplibola) 28-May-2018	West FCC JME 084 (Amplibola) 28-May-2018	East FCC (Amplibola) 28-May-2018	East FCC NEW 2 (Diloma) 28-May-2018	EAST FCC JME 090 (Cockle) 28-May-2018	
Lab Number:	1991753.1	1991753.2	1991753.3	1991753.4	1991753.5	
Individual Tests						
Dry Matter	g/100g as rcvd	13.9	12.7	11.1	16.6	10.0
Organochlorine Pesticides in Biomatter						
Aldrin	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
alpha-BHC	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
beta-BHC	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
delta-BHC	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
gamma-BHC (Lindane)	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
cis-Chlordane	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
trans-Chlordane	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
2,4'-DDD	mg/kg	< 0.0007	0.027	0.0168	0.0012	< 0.0005
4,4'-DDD	mg/kg	0.0014	0.076	0.060	0.0040	< 0.0005
2,4'-DDE	mg/kg	< 0.0007	0.0019	0.0011	< 0.0008	< 0.0005
4,4'-DDE	mg/kg	0.0116	0.64	0.106	0.0076	0.0007
2,4'-DDT	mg/kg	< 0.0007	< 0.0005	0.0031	< 0.0008	< 0.0005
4,4'-DDT	mg/kg	0.0030	0.0135	0.040	0.0041	< 0.0005
Dieldrin	mg/kg	< 0.0007	0.0157	0.049	0.0036	0.0007
Endosulfan I	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
Endosulfan II	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
Endosulfan sulfate	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
Endrin	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
Endrin aldehyde	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
Endrin ketone	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
Heptachlor	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
Heptachlor epoxide	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
Hexachlorobenzene	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
Methoxychlor	mg/kg	< 0.0007	< 0.0005	< 0.0005	< 0.0008	< 0.0005
Total Chlordane [(cis+trans)*100/42]	mg/kg	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sample Name:	East Control Hunter Brown (Cockle) 28-May-2018					
Lab Number:	1991753.6					
Individual Tests						
Dry Matter	g/100g as rcvd	10.5	-	-	-	-

Sample Type: Shellfish						
Sample Name:		East Control Hunter Brown (Cockle) 28-May-2018				
Lab Number:		1991753.6				
Organochlorine Pesticides in Biomatter						
Aldrin	mg/kg	< 0.0005	-	-	-	-
alpha-BHC	mg/kg	< 0.0005	-	-	-	-
beta-BHC	mg/kg	< 0.0005	-	-	-	-
delta-BHC	mg/kg	< 0.0005	-	-	-	-
gamma-BHC (Lindane)	mg/kg	< 0.0005	-	-	-	-
cis-Chlordane	mg/kg	< 0.0005	-	-	-	-
trans-Chlordane	mg/kg	< 0.0005	-	-	-	-
2,4'-DDD	mg/kg	< 0.0005	-	-	-	-
4,4'-DDD	mg/kg	< 0.0005	-	-	-	-
2,4'-DDE	mg/kg	< 0.0005	-	-	-	-
4,4'-DDE	mg/kg	< 0.0005	-	-	-	-
2,4'-DDT	mg/kg	< 0.0005	-	-	-	-
4,4'-DDT	mg/kg	< 0.0005	-	-	-	-
Dieldrin	mg/kg	< 0.0005	-	-	-	-
Endosulfan I	mg/kg	< 0.0005	-	-	-	-
Endosulfan II	mg/kg	< 0.0005	-	-	-	-
Endosulfan sulfate	mg/kg	< 0.0005	-	-	-	-
Endrin	mg/kg	< 0.0005	-	-	-	-
Endrin aldehyde	mg/kg	< 0.0005	-	-	-	-
Endrin ketone	mg/kg	< 0.0005	-	-	-	-
Heptachlor	mg/kg	< 0.0005	-	-	-	-
Heptachlor epoxide	mg/kg	< 0.0005	-	-	-	-
Hexachlorobenzene	mg/kg	< 0.0005	-	-	-	-
Methoxychlor	mg/kg	< 0.0005	-	-	-	-
Total Chlordane [(cis+trans)*100/42]	mg/kg	< 0.002	-	-	-	-

Summary of Methods

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

Sample Type: Shellfish			
Test	Method Description	Default Detection Limit	Sample No
Shucking of Shellfish	Removal of tissue from shell.	-	1-6
Homogenise	Mincing, chopping, or blending of sample to form homogenous sample fraction.	-	1-6
Dry Matter	Drying for minimum of 24 hours at 65°C, gravimetry. Fact Sheet No 2.3.2-14, A Compendium of Chemical, Physical and Biological Methods for Assessing and Monitoring the Remediation of Contaminated Sediment Sites, 2003.	0.10 g/100g as rcvd	1-6
Organochlorine Pesticides in Biomatter	Sonication extraction, alumina cleanup, GPC cleanup, dual column GC-ECD analysis	0.0005 - 0.002 mg/kg	1-6

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

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

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

Ara Heron BSc (Tech)
Client Services Manager - Environmental

Appendix 11. Summary of DDX and ADL data between 2018 and 2022.

SURFACE (0 - 2 cm)		SAC	West Control	West FCC JME 083	West FCC JME 081	West FCC JME 082	West FCC new1 (west)	West FCC new2 (middle)	West FCC new3 (east)	West FCC JME 084	East FCC JME 088	East FCC JME 087	East FCC JME 086	East FCC new1 (north)	East FCC new2 (south)	East FCC JME 090	East Control	West FCC Stream1 (low)	West FCC Stream2 (middle)	West FCC Stream3 (upper)
Test																				
ADL (2018)	0.01	0.0015	0.0015	0.0015	0.0015	0.0038	0.003	0.0015	0.0053	0.0093	0.0015	0.0015	0.0024	0.0015	0.0026	0.0015		0.0141	0.062	0.0177
2015 to 2018	0.01	Decline	Decline	Decline	Increase	Increase	Decline	No change	Increase	Increase	Decline	Increase	Decline	Decline	Increase	No change		Increase	Decline	Decline
DDX (2018)	0.01	0.003	0.0515	0.0166	0.0139	0.0883	0.0816	0.0135	0.0239	0.0724	0.027	0.0245	0.1153	0.0429	0.1688	0.003		0.262	0.9064	0.1476
2015 to 2018	0.01	Decline	Decline	Decline	Decline	Increase	Decline	Decline	Decline	Decline	Decline	Increase	Decline	Decline	Decline	No change		Decline	Decline	Decline
DEEP (6 - 10 cm)			West Control	West FCC JME 083	West FCC JME 081	West FCC JME 082	West FCC new1 (west)	West FCC new2 (middle)	West FCC new3 (east)	West FCC JME 084	East FCC JME 088	East FCC JME 087	East FCC JME 086	East FCC new1 (north)	East FCC new2 (south)	East FCC JME 090	East Control	West FCC Stream1 (low)	West FCC Stream2 (middle)	West FCC Stream3 (upper)
Test																				
ADL (2018)	0.01	0.0015	0.0154	0.0049	0.0015	0.0029	0.0024	0.0015	0.0119	0.0039	0.0015	0.0045	0.0039	0.0449	0.0029	0.0015		0.0121	0.1446	0.07
2015 to 2018	0.01	Decline	Decline	Decline	Increase	Increase	Increase	Increase	Increase	Decline	Decline	Decline	Increase	Decline	Decline	No change		Decline	Decline	Decline
DDX (2018)	0.01	0.0045	0.4401	0.1226	0.011	0.0985	0.1096	0.0106	0.2634	0.1379	0.0486	0.0256	0.2458	1.0983	0.1905	0.003		0.3267	5.98	0.7175
2015 to 2018	0.01	Decline	Decline	Decline	Increase	Increase	Increase	Increase	Increase	Decline	Increase	Decline	Decline	Decline	Decline	Increase	No change	Decline	Increase	Decline
SURFACE (0 - 2 cm)			West Control	West FCC JME 083	West FCC JME 081	West FCC JME 082	West FCC new1 (west)	West FCC new2 (middle)	West FCC new3 (east)	West FCC JME 084	East FCC JME 088	East FCC JME 087	East FCC JME 086	East FCC new1 (north)	East FCC new2 (south)	East FCC JME 090	East Control	West FCC Stream1 (low)	West FCC Stream2 (middle)	West FCC Stream3 (upper)
Test																				
ADL (2015)	0.01	0.005	0.0089	0.0024	0.001	0.002	0.0081	0.0015	0.0052	0.0018	0.0143	0.0015	0.0125	0.0016	0.0017	0.0015		0.0134	0.0694	0.036
ADL (2019)	0.01	0.0015	0.0068	0.0015	0.0036	0.0015	0.0015	0.0015	0.0015	0.0029	0.0041	0.0015	0.002	0.0015	0.0021	0.0015		0.0086	0.0875	0.033
2015 to 2019	0.01	Decline	Decline	Decline	Increase	Decline	Decline	No change	Decline	Increase	Decline	No change	Decline	Decline	Increase	No change		Decline	Increase	Decline
	0.01																			
DDX (2015)	0.01	0.005	0.42	0.1187	0.0363	0.0386	0.4619	0.0575	0.0694	0.1547	0.0711	0.0142	0.6257	0.0602	0.289	0.003		0.3194	1.543	0.6158
DDX (2019)	0.01	0.005	0.25	0.021	0.013	0.098	0.048	0.003	0.016	0.044	0.022	0.006	0.058	0.023	0.064	0.003		0.188	1.59	0.52
2015 to 2019	0.01	No change	Decline	Decline	Decline	Increase	Decline	Decline	Decline	Decline	Decline	Decline	Decline	Decline	Decline	No change		Decline	Increase	Decline
DEEP (6 - 10 cm)			West Control	West FCC JME 083	West FCC JME 081	West FCC JME 082	West FCC new1 (west)	West FCC new2 (middle)	West FCC new3 (east)	West FCC JME 084	East FCC JME 088	East FCC JME 087	East FCC JME 086	East FCC new1 (north)	East FCC new2 (south)	East FCC JME 090	East Control	West FCC Stream1 (low)	West FCC Stream2 (middle)	West FCC Stream3 (upper)
Test																				
ADL (2015)	0.01	0.005	0.0326	0.0082	0.0015	0.0015	0.0015	0.0015	0.0085	0.0144	0.0029	0.0052	0.0031	0.1338	0.003	0.0015		0.0158	0.1488	0.2423
ADL (2019)	0.01	0.0015	0.0124	0.0015	0.0015	0.0015	0.0021	0.0015	0.0115	0.0025	0.0983	0.0015	0.0045	0.0322	0.0037	0.0015		0.0172	0.1104	0.0274
2015 to 2019	0.01	Decline	Decline	Decline	No change	No change	Increase	No change	Increase	Decline	Increase	Decline	Increase	Decline	Increase	No change		Increase	Decline	Decline
	0.01																			
DDX (2015)	0.01	0.005	1.136	0.474	0.0036	0.0068	0.0183	0.0036	0.2369	1.3631	0.0479	0.1501	0.5386	3.9559	0.1823	0.003		0.3752	5.744	3.486
DDX (2019)	0.01	0.005	0.75	0.052	0.0035	0.007	0.042	0.007	0.29	0.053	0.041	0.014	0.3	2.2	0.28	0.003		0.37	3.4	1.18
2015 to 2019	0.01	No change	Decline	Decline	Decline	Increase	Increase	Increase	Increase	Decline	Decline	Decline	Decline	Decline	Increase	No change		Decline	Decline	Decline
SURFACE (0 - 2 cm)			West Control	West FCC JME 083	West FCC JME 081	West FCC JME 082	West FCC new1 (west)	West FCC new2 (middle)	West FCC new3 (east)	West FCC JME 084	East FCC JME 088	East FCC JME 087	East FCC JME 086	East FCC new1 (north)	East FCC new2 (south)	East FCC JME 090	East Control	West FCC Stream1 (low)	West FCC Stream2 (middle)	West FCC Stream3 (upper)
Test																				
ADL (2015)	0.01	0.005	0.0089	0.0024	0.001	0.002	0.0081	0.0015	0.0052	0.0018	0.0143	0.0015	0.0125	0.0016	0.0017	0.0015		0.0134	0.0694	0.036
ADL (2022)	0.01	0.0015	0.0039	0.002	0.0015	0.0015	0.0015	0.0015	0.0015	0.0052	0.0015	0.0015	0.0015	0.0027	0.0049	0.0015		0.0065	0.0281	0.0092
2015 to 2022	0.01	Decline	Decline	Decline	Increase	Decline	Decline	No change	Decline	Increase	Decline	No change	Decline	Increase	Increase	No change		Decline	Decline	Decline
	0.01																			
DDX (2015)	0.01	0.005	0.42	0.1187	0.0363	0.0386	0.4619	0.0575	0.0694	0.1547	0.0711	0.0142	0.6257	0.0602	0.289	0.003		0.3194	1.543	0.6158
DDX (2022)	0.01	0.003	0.24	0.068	0.019	0.015	0.014	0.008	0.008	0.047	0.012	0.014	0.023	0.077	0.043	0.003		0.156	0.55	0.67
2015 to 2022	0.01	Decline	Decline	Decline	Decline	Decline	Decline	Decline	Decline	Decline	Decline	Decline	Decline	Increase	Decline	No change		Decline	Decline	Increase
DEEP (6 - 10 cm)			West Control	West FCC JME 083	West FCC JME 081	West FCC JME 082	West FCC new1 (west)	West FCC new2 (middle)	West FCC new3 (east)	West FCC JME 084	East FCC JME 088	East FCC JME 087	East FCC JME 086	East FCC new1 (north)	East FCC new2 (south)	East FCC JME 090	East Control	West FCC Stream1 (low)	West FCC Stream2 (middle)	West FCC Stream3 (upper)
Test																				
ADL (2015)	0.01	0.005	0.0326	0.0082	0.0015	0.0015	0.0015	0.0015	0.0085	0.0144	0.0029	0.0052	0.0031	0.1338	0.003	0.0015		0.0158	0.1488	0.2423
ADL (2022)	0.01	0.0015	0.0161	0.0052	0.0015	0.0015	0.0015	0.0015	0.0015	0.0023	0.003	0.0178	0.0052	0.0024	0.0705	0.02845	0.0015	0.0057	0.01	0.0047
2015 to 2022	0.01	Decline	Decline	Decline	No change	No change	No change	No change	Decline	Decline	Increase	No change	Decline	Decline	Decline	Increase	No change	Decline	Decline	Decline
	0.01																			
DDX (2015)	0.01	0.005	1.136	0.474	0.0036	0.0068	0.0183	0.0036	0.2369	1.3631	0.0479	0.1501	0.5386	3.9559	0.1823	0.003		0.3752	5.744	3.486
DDX (2022)	0.01	0.003	1.0	0.43	0.003	0.006	0.028	0.006	0.065	0.134	0.159	0.055	0.071	1.79	0.55	0.003		0.172	0.3	0.67
2015 to 2022	0.01	Decline	Decline	Decline	Decline	Decline	Increase	Increase	Decline	Decline	Increase	Decline	Decline	Decline	Increase	No change		Decline	Decline	Decline

Note: <0.001 type values have been halved to calculate means