Levin Landfill April/June 2023 Quarterly Groundwater, Surface Water and Leachate Monitoring Report

PREPARED FOR Horowhenua District Council | September 2023

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Revision Schedule

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Abbreviations

Abbreviation	Name
ANZECC LDW	ANZECC 2000 Livestock Drinking Water
BDL	Below the detection limit
cfu	Colony-forming unit
COD	Chemical Oxygen Demand
DWSNZ GVs	Drinking Water Standards for New Zealand - Guideline Values for aesthetic determinants
DWSNZ MAVs	Drinking Water Standards for New Zealand – Maximum Acceptable Values
EC	Electrical Conductivity
HDC	Horowhenua District Council
Hg	Soluble mercury
HRC	Horizons Regional Council
mbgl	Metres below ground level
NH_3-N	Ammoniacal-nitrogen
NO_3-N	Nitrate nitrogen
ppm	Parts per million
scBOD$_5$	Soluble carbonaceous Biochemical Oxygen Demand (5-day)

Executive Summary

Horowhenua District Council (HDC) is required to carry out quarterly compliance monitoring of groundwater and monthly sampling at selected surface water monitoring locations at the Levin Landfill, as part of the conditions of Resource Consents ATH-2002003982.03 (formerly DP6009), ATH-2002003983.02 (formerly DP6010), ATH-2002003984.02 (formerly DP6011) and ATH-2002009801.02 (formerly DP102259). This report summarises the findings for the monitoring events from the fourth quarter (i.e., February 2023 to April 2023) sampling round[1] and includes results for:

- Background (natural) groundwater (Bores G1S and G1D)
- Landfill leachate (manhole next to leachate pond)
- Groundwater bores, down-gradient of the new landfill (Bores D1, D2, D3rs, D4, D5, D6 and E1S)
- Groundwater bores within the old irrigation area (Bores F1, F2 and F3)
- Shallow aquifers, down-gradient of the old landfill (Bores B1, B2, B3s, C2, C2DS, E2S, G2s, Xs1 and Xs2)
- The deep aquifer (Bores C2DD, D3rd, E1D, E2D and Xd1)
- The Northern Farm Drain (TD1), and
- The Hokio Stream (HS1A, HS1, HS2 and HS3).

Stantec has reviewed the results of this fourth quarter monitoring round on behalf of HDC.

Monitoring results for other aspects of the landfill operations such as for air quality/odour and stormwater quality are reported annually, as per resource consent requirements.

Samples were collected from 27 groundwater bores from around Levin Landfill during April and June[1] 2023, and landfill leachate was sampled at a manhole next to the leachate pond. Additionally, five surface water sites were each sampled during February 2023, March 2023, and April 2023. All samples were analysed for the parameters set out in ATH-2002003983.02, and as listed in the results tables presented in this report.

For samples taken in April 2023, the time between sampling and reception at the laboratory ranged between 28 – 54 hours, which for most samples was outside the normally accepted timeframe of <24 hours. In June 2023, the time between sampling and reception at the laboratory ranged between 9 – 74 hours, obviously well outside of the normally accepted 24 hours timeframe. Meeting the monitoring timeframe is important because it provides greater confidence in the reliability of results, and comparisons with historical data.

The resource consent for the landfill (namely, ATH-2002003983.02) establishes compliance limits for the quality of deeper and shallow groundwater which are based upon the Drinking Water Standards for New Zealand – Maximum Acceptable Values (DWSNZ MAVs), Guideline Values for aesthetic determinants (DWSNZ GVs), and the ANZECC 2000 Livestock Drinking Water (ANZECC LDW) trigger values, respectively. Compliance limits for surface water are based on the ANZECC 2000[2] default guideline values (DGV) for 95th percentile species protection for toxicants in freshwater, as required by the revised Resource Consent condition approved in December 2019.

The February 2023 to April/June 2023 monitoring results have been assessed against these limits, where they are applicable.

Thirty-two non-compliances with resource consent conditions were recorded across eight monitoring locations, as follows:

- *E. coli* counts exceeded the ANZECC LDW trigger value of 100 cfu/100ml at bore C2 (6,000 cfu/100mL) in April 2023. Elevated E. coli at C2 has been observed historically, but this is the highest recorded level since monitoring began in February 1994.
- *E. coli* counts exceeded the DWSNZ MAV of NIL at bore E2D (38 cfu/100mL) in June 2023.
- Hardness exceeded the DWSNZ MAV of 200 mg CaCO3/L at bore D3rd (201 mg CaCO3/L) in June 2023. This is characteristic of D3rd.

[1] Sampling done in April 2023 should have been tested for the comprehensive suite of parameters. Through scheduling errors, this was not done, and a decision was taken to redo the sampling round again. This was completed in June 2023, hence the delay in preparing this report and the reporting on June 2023 results, in addition to the April testing that was done.

[2] Now superseded by the Australian and New Zealand Water Quality Guidelines 2018 (ANZG 2018), however the ANZECC 2000 guideline values are applied in accordance with the resource consent.

- Dissolved manganese concentrations exceeded the DWSNZ MAV of 0.5 mg/L in bores C2DD (0.69 mg/L), E2D (0.45 mg/L), Xd1 (0.58 mg/L) and D3rd (0.49 mg/L) in June 2023. The results for C2DD (from 1997), E2D (from 1997), Xd1 (from March 2021 when sampling started) and D3rd (from October 2021 when sampling started) are within the historical range of concentrations observed. Dissolved manganese is generally elevated in the deep aquifer bores.
- $scBOD_5$ exceeded the ANZECC (95%ile) DGV of 2 mg/L at TD1 across all dates, with a value of *3* mg/L – half the detection limit of 6 mg/L. This emphasises the importance of a detection limit below the standard at which a parameter is assessed – if the detection limit was reduced, these results may have been compliant, but currently must be considered exceedances.
- Nitrate-N exceeded the ANZECC (95%ile) DGV of 0.16 mg/L at TD1 in February 2023 (0.57 mg/L), March 2023 (0.7 mg/L), and April 2023 (0.25 mg/L). This site has commonly presented elevated Nitrate-N levels.
- Ammoniacal-N exceeded the ANZECC (95%ile) DGV of 2.1 mg/L at TD1 in February 2023 (6.37 mg/L), March 2023 (11.7 mg/L), and April 2023 (7.77 mg/L).
- $scBOD_5$ exceeded the ANZECC (95%ile) DGV of 2 mg/L at all Hokio Stream sites in February 2023 and March 2023, with a consistent value of *3* mg/L – half the detection limit of 6 mg/L.
- Nitrate-N concentrations exceeded the ANZECC (95%ile) DGV and consent trigger value of 0.16 mg/L in February 2023, March 2023, and April 2023 at HS2 and HS3. N-Nitrate exceedances are not unusual at these sites.
- Ammoniacal-N exceeded the ANZECC (95%ile) DGV and consent trigger value of 2.1 mg/L at HS2 (3.67 mg/L) in March 2023.
- Dissolved aluminium exceeded the ANZECC (95%ile) DGV and consent trigger value of 0.055 mg/L in February 2023 at HS1A with a value of 2580 mg/L. This result is significantly concentrated, and is the greatest level recorded across all Hokio Stream sites (by a considerable amount), since monitoring began. This should be investigated further, to determine if this is erroneous or true. Given the lack of elevated results downstream, it is considered more likely to be an error.

The April/June 2023 results were also considered in the context of background water quality, both within the groundwater aquifers (shallow and deep bores) and the surface water receiving environment. For example, low pH at background bore G1S, and elevated aluminium concentrations in the same bore indicate that groundwater could be being impacted by up-gradient activities unrelated to the landfill operations. This trend will be examined in greater detail in the Annual Report.

There were seven occasions where the leachate effluent quality (at the leachate pond manhole sampling location) was outside the ranges for typical leachate composition, as recorded generally at Class 1 landfills in New Zealand. This occurred for the parameters conductivity, Ammonia-N, dissolved iron, lead, mercury, and nickel. Note that leachate effluent is not subject to any consent limits. Typical leachate concentrations are derived from tables presented in the WasteMINZ *Technical Guidelines*. The data in those tables originate from seven landfills in New Zealand and date back to between 1998 and 1999. More updated data could be sought for comparison purposes.

For *E. coli* the current laboratory detection limit is 100 CFU/100ml. This is impractical, as recent practice has been to halve any results which have fallen below the level of detection (as described in Section 2.1 of this report). The ANZECC LDW is also set at 100 CFU/100ml and the DWSNZ MAV is NIL, thus room for error through unknown values is large.

Methane was detected in eleven of the bores in April 2023, and eight of the bores in June 2023 – including the unlabelled sample. In April 2023, the highest recorded level was 0.12% in bore D6, with the other bores ranging from 0.01 – 0.09%. In June 2023, the highest recorded level was again 0.12% in bore D6, with the other bores ranging from 0.01 – 0.03%. These results are well below the lower explosive limit of 5% and is therefore deemed to represent a 'safe' level.

In April 2023, landfill bore B2 showed the highest carbon dioxide level of 1.48% - a considerable decrease to the previous quarter. This bore has demonstrated such fluctuations historically. However, this result is still relatively higher than all other bores – the next highest being 0.52%. In June 2023, bore C1 presented a significant concentration of 20.2%. This result appears uncharacteristic and should be investigated further. The next greatest concentration of CO_2 for June 2023 was 1.5% at G2s.

Hydrogen sulphide was detected one bore – G1s (1 ppm) in April 2023, which is around the threshold at which a 'rotten egg' smell (commonly associated with H_2S) can be detected. Hydrogen sulphide was not detected at any sites in June 2023.

The possibility of encountering methane (and possible hydrogen sulphide) in groundwater bores endorses the need for appropriate health and safety measures to be adopted during monitoring, as is the case for the landfill gas extraction wells. No smoking should be permitted when personnel undertake groundwater sampling and when in the vicinity of the groundwater monitoring wells, or in fact anywhere else on the Levin Landfill site. For sake of safety a personal gas detector should be worn by all staff when working at the landfill site.

1 Introduction

Horowhenua District Council (HDC) first commissioned Stantec New Zealand (then Montgomery Watson) to carry out environmental reporting for the discharge consent monitoring undertaken at the Levin Landfill site in the early 2000s. Monitoring has been undertaken by contractors every three months at 33 locations, as required by the resource consent conditions (namely for discharge permit ATH-2002003983.02). These sampling locations consist of 27 boreholes penetrating the sand and gravel aquifers; four surface water sampling locations within Hokio Stream; one surface sampling location along the Northern Farm Drain (previously referenced as the Tatana Drain), and one leachate sampling point, as shown in the Site Plan in Appendix A.

The Levin Landfill site is comprised of two landfills: one old, closed, and unlined landfill and one new, lined landfill that has been closed pending a decision by HDC to continue operating it. The new landfill footprint has been developed in stages. The most recent stage was Stage 3C which was developed in 2017, though landfill operations have, until the end of October 2021, occurred over the top of Stages 1A, 2 and 3C. The current landfill within this new footprint has reached capacity and has been capped with a permanent clay capping (0.7m thick) on all sides except for under the access road and on the front face of the landfill where there is a temporary capping (0.3m thick). Council has decided to close the landfill for the disposal of municipal waste and completion of the clay capping is to occur later this year.

The Levin Landfill site is located above two identified aquifers, a shallow sand aquifer and a deeper gravel aquifer. The shallow aquifer is unconfined, has a low to moderate permeability, and flows in a northerly direction. The deeper gravel aquifer is a confined to semi-confined aquifer. Horizons Regional Council hydrology staff advises that '*the general confined groundwater flow direction is towards the west*". Groundwater quality in the area is highly variable because of interaction with peat deposits that are prevalent in the area, localised effects such as from grazing activities, droppings from scavenging birds and from nitrogen-fixing plants such as gorse.

Since July 2010 groundwater has been tested for dissolved metals and nutrients, rather than for total concentrations of these parameters.

A review of the resource consent conditions was finalised in December 2019. Changes have been made to some of the surface water and groundwater monitoring conditions and HDC has acted on all the changes. Sampling since the January 2021 sampling round has been in line with previous monitoring, but different reference parameters have been applied to assess the surface water sampling results, as required by the new consent conditions.

This report presents the results of sampling conducted in April and June 2023, which was required as described further. Sampling done in April 2023 should have been tested for the comprehensive suite of parameters. Through scheduling errors, this was not done, and a decision was taken to redo the sampling round again. This was completed in June 2023, hence the delay in preparing this report and the reporting on June 2023 results, in addition to the April testing that was done.

All test results and laboratory detection limits are attached in Appendix C.

2 Groundwater and Surface Water Monitoring

2.1 Sample Analyses

Surface water samples were collected by Downer (a contractor to HDC) on 16 February 2023, 8 March 2023, 6 April and 13 April 2023 with the samples being received by the Eurofins ELS Ltd laboratory in Lower Hutt, Wellington. The timeframe between sample collection and laboratory reception varied between 29 and 54 hours which is outside the normally accepted range of within 24 hours.

In April groundwater samples were collected by Downer (a contractor to HDC) on 03, 04,05, and 06 April, with the samples being received by the Eurofins ELS Ltd laboratory in Lower Hutt, Wellington. Whilst samples were collected within the normally accepted monitoring timeframe of within seven days, the time between collection and laboratory reception varied between 28 and 54 hours which is outside the normally accepted range of within 24 hours.

The June re-test groundwater samples were collected on the 12, 13, 14 and 15 June, with the time between collection and laboratory reception varying between 9 and 51 hours, though the sample for bore Xs2 took 74 hours between sampling and delivery to the laboratory, which is not acceptable.

In both the April and June sampling rounds, no record of collection dates/times were recorded for several bores. In this report those dates have been assumed from data of adjacent bores. Additionally, for many bores in the June sampling round, the collection time was recorded as being 00.00 (i.e., just after midnight), which is clearly an error.

Borehole water levels were measured on 6 April and 9 June 2023.

The monitoring schedule for July 2021 - April 2024 is summarised in Appendix B. From July 2019, *E. coli* counts analyses have been included within the indicator and comprehensive analytical suites, as agreed by HDC with the Horizons Regional Council (HRC). This means that *E. coli* counts will be assessed more frequently throughout each year, as compared to the past monitoring regime.

Groundwater samples taken at each of the boreholes and a sample of the leachate effluent should have been analysed for the comprehensive list of parameters, which is outlined in Table 2-1. Because of a scheduling error, this was not done, hence the need to re-sample in June so that the comprehensive suite of parameters could be properly tested for. Surface water samples from Hokio Stream were analysed for the comprehensive list of parameters (see Table 2-1).

Note that, following the revision of the resource consent conditions which were approved in December 2019, 5-day soluble carbonaceous Biochemical Oxygen Demand ($scBOD_5$) and soluble mercury (Hg) have each been added to the indicator and comprehensive suites of parameters, and *E. coli* added to the comprehensive suite of parameters. The $scBOD_5$ and *E. coli* parameters replace BOD_5 and faecal coliforms, respectively. Monitoring of these additional parameters began with the April 2020 sampling round.

Table 2-1: Test Parameters

Type	Indicator Parameters	Comprehensive Parameters
Physico-chemical characteristics	pH, Electrical Conductivity (EC)	pH, Electrical Conductivity (EC), Alkalinity, Total Hardness, Suspended Solids
Oxygen demand	Chemical Oxygen Demand (COD), $scBOD_5$**	Chemical Oxygen Demand (COD), soluble carbonaceous Biochemical Oxygen Demand ($scBOD_5$**)
Nutrients*	Nitrate nitrogen (NO_3-N), Ammoniacal-nitrogen (NH_4-N)	Nitrate nitrogen (NO_3-N), Ammoniacal-nitrogen (NH_4-N), Dissolved Reactive Phosphorus (DRP), Sulphate (SO_4)
Metals*	Aluminium (Al), Manganese (Mn), Nickel (Ni), Lead (Pb), Mercury (Hg)**	Aluminium (Al), Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Iron (Fe)***, Magnesium (Mg), Manganese (Mn), Nickel (Ni), Lead (Pb), Zinc (Zn), Mercury (Hg)**
Other elements	Boron (B), Chloride (Cl)	Boron (B), Calcium (Ca), Chloride (Cl), Potassium (K), Sodium (Na)***
Biological+	*E. coli*	*E. coli*

Type	Indicator Parameters	Comprehensive Parameters
Organics	Not required	Total organic carbon, total phenols, volatile acids

Note:

*Analyses performed for nutrients and metals are for dissolved rather than total concentrations.

** $scBOD_5$ and Soluble Mercury added as per revised consent conditions for Discharge Permit ATH-2002003983.02, December 2019

*** Iron and sodium are tested at certain groundwater bores only.

Those chemical constituents for which concentrations were below laboratory detection limits during the reporting period have had results set at 50% of the laboratory detection limit, which is then used to calculate a median value for annual reporting purposes. This is standard practice when dealing with chemical concentrations in water, where the constituent is not detected.

For *E. coli*, the current laboratory detection limit, viz.,100 CFU/100ml, is not compatible with the standards defined in the consents. The ANZECC LDW is also set at 100 CFU/100ml and the DWSNZ MAV is NIL, thus room for error through unknown values is large. Whilst results below the detection limit have been described as 'not detected' (ND), due to specific results being unknown, these should be considered with caution. This detection limit is unacceptable and should be remedied for future sampling periods.

2.2 Background Groundwater Quality

The background (natural) quality of the groundwater water up-gradient from the landfill site is not subject to any consent conditions. However, for comparison purposes, both the ANZECC LDW trigger values and the DWSNZ guidelines are regularly used to benchmark the quality of water up-gradient from the landfill site.

Groundwater samples were collected from the two background bores situated hydraulically up-gradient from both the new and old landfills to the southeast of the site in April/June 2023 (bores G1S and G1D, see Site Plan, Appendix A). These two bores were constructed in late 2009 to sample background water quality from the two main hydrogeological units. Bore F3 is also included in the background table as it is near the southern boundary of the landfill site (and further west) and is unlikely to be impacted by landfill activities. A full laboratory report containing analytical results is presented in Appendix C and the historical graphs are presented in Appendix D.

The results are presented in Table 2-2.

Results since 2010 for the background bores indicate that low pH values (i.e., typically between 6.0 and 6.8) are representative of background water quality in the shallow sand aquifer (G1S). The pH level for the June 2023 sampling round was 6.9 which is below the lower limit of the DWSNZ MAV for aesthetic determinants (7.0 pH units). As usual the deeper gravel aquifer (G1D) had a slightly higher pH of 7.1.

During the June 2023 sampling round, the dissolved aluminium concentration at G1S (0.15 mg/L) exceeded the DWSNZ MAV limit of 0.1 mg/L, but this is within the range observed at this location historically.

Dissolved iron concentrations have fluctuated considerably at both the G1S and G1D bores since monitoring of those bores began in 2010 and are mostly above the DWSNZ GV for aesthetic determinants (0.2 mg/L). During both the April 2023 sampling round, and the June 2023 re-testing round, the iron concentration at G1S was between 1.03 and 2.05 mg/L – an exceedance of the DWSNZ GV but still within the historical results range recorded at this bore. Dissolved iron concentrations in G1D varied between 0.23 and 0.32 mg/L – again, within historical ranges. Elevated iron concentrations in groundwater are likely to be related to hydrogeological conditions found at the site and this phenomenon is common in groundwater in this area.

All parameters at bore F3 were within the ANZECC LDW trigger values for April/June monitoring.

The monitoring results suggest that the quality of background groundwater may be being impacted by local ground conditions and/or activities up-gradient of the landfill. Background bore G1S consistently records elevated concentrations of a range of parameters. Overall, monitoring results at G1S indicate that it is likely modified or impacted by anthropogenic activities, and therefore may not be suitable to use as reliable 'control' location for background water quality in the future.

For *E. coli*, the level of laboratory detection fluctuated between 1cfu/100mL and 100 cfu/100mL. This means that levels of non-detection fluctuated above the comparable standard, which is not acceptable analytical practice.

Table 2-2: Background Monitoring Results for April and June 2023.

Determinant	Units	DWSNZ MAV	ANZECC LDW	G1S		G1D		F3	
Sampling date				04 April 2023	12 June 2023	04 April 2023#	12 June 2023	04 April 2023	12 June 2023#
Water Level	mbgl	-	-	13.8	13.55	14.14	14.1	4	4.2
pH	pH units	7 to 8.5*	6 to 9		**6.9**		7.2		7.1
Suspended Solids	mg/l	-	-		43		11		*2.5*
Phenol	mg/l	-	-		*0.025*		*0.025*		*0.025*
VFA	mg/l	-	-		*2.5*		*2.5*		*2.5*
TOC	mg/L	-	-		15.5		1.9		1.3
Alkalinity	mg $CaCO_3$/L	-	-	92	81	64	64	56	57
Conductivity	mS/m	-	-	46.2	45.5	28.2	27.8	18.3	18.6
COD	mg/L	-	-	45	48	16	32	*7.5*	*7.5*
$scBOD_5$	mg/L	-	-	*1.5*	*1.5*	*1.5*	*0.5*	*1.5*	*0.5*
E. coli	CFU/100ml	NIL	100	ND	ND	ND	ND	ND	ND
Chloride	mg/L	250*	-	72	81.5	31.7	33.1	16.1	16.4
Nitrate-N	mg/L	11.3	90.3		0.05		*0.005*		0.99
Sulphate	mg/L	250*	1000		7.05		22.3		4.91
Ammoniacal-N	mg/L	1.17	-	0.03	0.03	0.1	0.14	*0.005*	*0.005*
Hardness	mg $CaCO_3$/L	200*	-		45		57		32
Calcium	mg/L	-	1000	8.77	7.98	9.06	8.53	4.67	4.76
Magnesium	mg/L	-	-		6		8.69		4.92
Potassium	mg/L	-	-		4.6		6.17		4.88
Sodium	mg/L	200*	-		69.5		28.2		23
D.R. Phosphorus	mg/L	-	-	0.04	0.025	0.019	0.023	0.15	0.15
Dissolved Aluminium	mg/L	0.1*	5	0.065	**0.15**	*0.001*	0.004	0.002	*0.001*
Dissolved Arsenic	mg/L	0.01	0.5	0.002	0.001	0.002	0.002	0.001	0.002
Dissolved Boron	mg/L	1.4	5	0.03	0.03	0.04	0.05	0.03	0.04
Dissolved Cadmium	mg/L	0.004	0.01	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*
Dissolved Chromium (VI)	mg/L	0.05	1	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*

Determinant	Units	DWSNZ MAV	ANZECC LDW	G1S		G1D		F3	
Dissolved Copper	mg/L	2	0.4	0.0056	0.0071	*0.00025*	*0.00025*	*0.00025*	*0.00025*
Dissolved Iron	mg/L	0.2*	-	**2.05**	**1.3**	**0.23**	**0.32**	*0.0025*	*0.0025*
Dissolved Lead	mg/L	0.01	0.1		0.0012		0.0008		*0.00025*
Dissolved Manganese	mg/L	0.4	-		0.059		0.068		*0.00025*
Dissolved Mercury	mg/L	-	0.002		*0.00025*		*0.00025*		*0.00025*
Dissolved Nickel	mg/L	0.08	1		0.0013		*0.00025*		*0.00025*
Dissolved Zinc	mg/L	1.5*	20		0.012		*0.001*		*0.001*

Notes:

*denotes guideline values for aesthetic determinants (G.V.)

All `<' values have been reported as half the detection limit for statistical purposes and are *expressed in italics*

'ND' indicates where *E. coli* were not detected at or above the laboratory detection limit

n/r – not required to be tested during this monitoring period

Values which exceeded the DWSNZ MAV are shown in **bold**

[#] Sampling date not stated in results report but assumed from other data.

2.3 Groundwater Quality Hydraulically Down-Gradient of the New Landfill

Monitoring is carried out within the two main hydrogeological units for bores hydraulically up-gradient of the old landfill and hydraulically down-gradient of the new landfill.

2.3.1 Shallow Aquifer

Bores D1, D2, D3rs, D4, D6, and E1S (Refer to Site Plan, Appendix A) are located hydraulically up-gradient of the old landfill, but down-gradient of the new landfill. This means they are not influenced by potential leaching from the old landfill and can act as a warning system for any leaching from the new landfill.

Borehole D5 is located at the south-western corner of the site and is expected to provide an indication of shallow background groundwater quality because it is unlikely to be influenced by either landfill.

It is considered unlikely that leachate from the new landfill would significantly affect groundwater quality due to the leachate collection system which is in place at the new landfill; however, these bores would still provide early warning of any potential problems. It is noted that bore D3r was replaced in June 2021 with two bores; D3rs, which is a shallow bore and D3rd, which is a deep bore. Both have been sampled from October 2021 onwards. It is also noted that new bores D3rs and D3rd are required to be monitored for the comprehensive suite of parameters for the first two years following installation.

The results from the April/June 2023 monitoring rounds for these bores are presented in Table 2-3 and the results have been compared with the ANZECC LDW trigger values as per the consent conditions.

The full laboratory report is included in Appendix C and the historical graphs are presented in Appendix D.

All sampling results for *E. coli*, were reported as being below the level of detection (<100 CFU/100ml).

Therefore, there were **no exceedances of the resource consent conditions during the April/June 2023** monitoring rounds in samples from the shallow aquifer.

Table 2-3: D-Series and E1S Monitoring Bore Results for April and June 2023

Determinant	Units	ANZECC LDW	D1		D2		D3rs		D4		D5		D6		E1S	
Sampling date			03 April 2023	13 June 2023	03 April 2023	13 June 2023	03 April 2023	13 June 2023	05 April 2023	15 June 2023	04 April 2023	12 June 2023	04 April 2023	13 June 2023	05 April 2023	15 June 2023
Water Level	mbgl	-	16.6	1.64	21.12	21.5	5.13	5.2	7.55	7.41	0.93	8.8	16.21	1.61	11.09	10.9
pH	pH units	6 to 9		6.9		6.4		6.5		7.1		7.1		6.8		7.1
Suspended Solids	mg/l	-		*2.5*		7		3		*2.5*		*2.5*		*2.5*		6
Phenol	mg/l	-		*0.025*		*0.025*		*0.025*		*0.025*		*0.025*		*0.025*		*0.025*
VFA	mg/l	-		*2.5*		*2.5*		*2.5*		*2.5*		*2.5*		*2.5*		*2.5*
TOC	mg/L	-		1		12		23.3		3.7		2.1		1		4.9
Alkalinity	mg $CaCO_3$/L	-	89	129	147	158	64	65	85	85	84	78	113	123	87	83
Conductivity	mS/m	-	33.6	38.6	48.2	51	20.1	19.7	28.3	27.5	31.8	30.5	37.7	42.8	25.9	26
COD	mg/L	-	*7.5*	*7.5*	42	33	67	63	20	*7.5*	*7.5*	*7.5*	*7.5*	*7.5*	16	*7.5*
$scBOD_5$	mg/L	-	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*3*	*0.5*	*1.5*	*0.5*	*1.5*	*0.5*	*3*	*2*
E. coli	CFU/100ml	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloride	mg/L	-	14.3	15.7	50.7	51.4	16.5	16.3	31.4	31.4	30.8	28.4	16.9	22	26.4	27
Nitrate-N	mg/L	90.3		8.01		*0.005*		*0.005*		*0.005*		1.3		12.4		*0.005*
Sulphate	mg/L	1000		8.69		8.93		2.1		5.01		17.1		6.5		3.66
Ammoniacal-N	mg/L	-	*0.005*	*0.005*	0.65	0.69	0.67	0.67	0.23	0.23	0.01	*0.005*	*0.005*	*0.005*	0.21	0.17
Hardness	mg $CaCO_3$/L	-		109		137		47		56		68		123		59
Calcium	mg/L	1000	16.4	19.8	22.8	22.7	11.2	10.6	11.4	10.4	12.8	11.3	19	21.8	11.6	10.9
Magnesium	mg/L	-		14.5		19.4		4.87		7.17		9.61		16.6		7.72
Potassium	mg/L	-		9.03		9.61		3.69		5.62		8.28		7.95		5.92
Sodium	mg/L	-		33.9		42.4		21.4		32.2		28.9		34.4		29.8
D.R. Phosphorus	mg/L	-	0.095	0.099	0.027	0.042	0.065	0.096	0.023	0.029	0.072	0.097	0.106	0.101	0.048	0.069
Dissolved Aluminium	mg/L	5	*0.001*	0.002	0.009	0.003	0.088	0.066	0.005	0.003	0.002	*0.001*	0.003	*0.001*	0.012	0.006
Dissolved Arsenic	mg/L	0.5	0.001	0.001	*0.0005*	*0.0005*	0.001	0.001	0.003	0.003	*0.0005*	*0.0005*	0.001	0.001	0.002	0.002
Dissolved Boron	mg/L	5	0.05	0.04	0.06	0.04	0.04	*0.015*	0.2	0.11	0.04	0.05	0.06	0.04	0.1	0.12
Dissolved Cadmium	mg/L	0.01	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*
Dissolved Chromium (VI)	mg/L	1	*0.0005*	*0.0005*	*0.0005*	*0.0005*	0.004	0.004	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*
Dissolved Copper	mg/L	0.4	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	0.0008	*0.00025*	*0.00025*	*0.00025*	0.0009	0.002	0.0006	*0.00025*	*0.0025*
Dissolved Iron	mg/L	-	*0.0025*	*0.0025*	5.01	9	17.2	11.4	0.866	1.26	0.117	0.082	*0.0025*	*0.0025*	5.14	4.73
Dissolved Lead	mg/L	0.1		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*		0.0015
Dissolved Manganese	mg/L	-		*0.00025*		0.499		0.346		0.188		0.0189		0.001		0.243
Dissolved Mercury	mg/L	0.002		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*
Dissolved Nickel	mg/L	1		*0.00025*		*0.00025*		*0.00025*		0.0082		*0.00025*		*0.00025*		0.0014
Dissolved Zinc	mg/L	20		*0.001*		0.003		0.003		0.003		*0.001*		*0.001*		0.023

Notes:
Results for bore D3rs were not available at the time of writing.
Bold – denotes an exceedance of the ANZECC LDW
Underlined – denotes exceedance of the Consent Trigger Value.
'ND' indicates where *E. coli* were not detected at or above the laboratory detection limit
All `<' values have been reported as half the detection limit for statistical purposes and are expressed in italics
n/r – not required to be tested during this monitoring period

2.3.2 Deep Gravel Aquifer

Bores E1D, C2DD, E2D, Xd1, and the new replacement bore D3rd all penetrate the deeper gravel aquifer. Deep groundwater flow is assumed to be towards the northwest.

Boreholes E2D and C2DD are located to the north-northwest of both the landfills and are therefore considered to be hydraulically down-gradient of both landfills.

Borehole E1D is located to the southwest of the old landfill and it is therefore considered that this bore would be unlikely to be affected by either landfill.

Bore Xd1 was installed in late 2020 as a requirement of the reviewed resource consent conditions (December 2019). It is located on the western boundary of the site and slightly downstream of the old landfill.

Results for the April/June 2023 compliance monitoring rounds are presented in Table 2-4. The results have been compared with the DWSNZ as per the requirements of discharge consent ATH-2002003983.02. The full laboratory report is included in Appendix C and the historical graphs are presented in Appendix D.

There were **six exceedances of the DWSNZ limits** in samples from the deep gravel aquifer during the April/June 2023 monitoring round, as follows:

- *E. coli* in bore E2D exceeded the DWSNZ MAV of NIL with a value of 38 cfu/100mL in June 2023.
- Hardness in bore D3rd (201 mg $CaCO_3$/L) exceeded the DWSNZ MAV of 200 mg $CaCO_3$/L in June 2023. Elevated hardness is characteristic of D3rd.
- The dissolved manganese concentrations in bores C2DD (0.69 mg/L), E2D (0.45 mg/L), Xd1 (0.58 mg/L) and D3rd (0.49 mg/L) exceeded the DWSNZ MAV of 0.4 mg/L in June 2023. The results for C2DD (from 1997), E2D (from 1997), Xd1 (from March 2021 when sampling started) and D3rd (from October 2021 when sampling started) are within the historical range of concentrations observed. Dissolved manganese is generally elevated in the deep aquifer bores.

Table 2-4: Results for Monitoring Bores within the Deep Aquifer for April and June 2023

Determinant	Units	DWSNZ MAV	E1D		C2DD		E2D		Xd1		D3rd	
Sampling date			05 April 2023#	13 June 2023	05 April 2023#	13 June 2023	05 April 2023#	13 June 2023	06 April 2023#	15 June 2023	03 April 2023#	13 June 2023
Water Level	mbgl	-	10.97	2.88	2.58	2.3	4.49	2.3	2.38	2.05	5.73	5.8
pH	pH units	7 to 8.5*		7.8		7.5		7.5		7.7		7.6
Suspended Solids	mg/l	-		13		275		21		16		64
Phenol	mg/l	-		*0.025*		*0.025*		*0.025*		*0.025*		*0.025*
VFA	mg/l	-		*2.5*		*2.5*		*2.5*		*2.5*		*2.5*
TOC	mg/L	-		3		6.8		3.2		4.4		6.2
Alkalinity	mg $CaCO_3$/L	-	170	172	217	214	158	163	203	188	209	218
Conductivity	mS/m	-	45	44.7	55.3	53.7	44.5	44.9	53.8	53.6	51.8	51.9
COD	mg/L	-	18	*7.5*	*7.5*	20	*7.5*	23	22	22	23	*7.5*
$scBOD_5$	mg/L	-	*3*	*0.5*	*1.5*	*0.5*	*1.5*	*0.5*	*1.5*	*0.5*	*0.5*	*0.5*
E. coli	CFU/100ml	NIL	ND	ND	ND	ND	ND	**38**	ND	ND	ND	ND
Chloride	mg/L	250*	38.2	39.1	40.3	39.6	40.7	41.7	57.6	57.3	31	31.6
Nitrate-N	mg/L	11.3		*0.005*		*0.005*		*0.005*		*0.005*		*0.005*
Sulphate	mg/L	250*		*0.01*		0.11		*0.01*		*0.01*		*0.01*
Ammoniacal-N	mg/L	1.17	0.2	0.18	0.34	0.26	0.27	0.28	0.35	0.41	0.38	0.4
Hardness	mg $CaCO_3$/L	200*		134		181		129		168		**201**
Calcium	mg/L	-	33.6	30.9	46.6	45.3	26.1	27.4		38.1	64.5	58.1
Magnesium	mg/L	-		13.9		16.6		14.6		17.7		13.5
Potassium	mg/L	-		5.05		7.35		5.96		6.31		6.45
Sodium	mg/L	200*		36.5		41.1		41.7		44.2		22.4
D.R. Phosphorus	mg/L	-	0.39	0.38	0.67	0.63	0.61	0.62	0.11	0.1	1.24	1.22
Dissolved Aluminium	mg/L	0.1*	0.004	0.002	*0.001*	0.011	0.002	0.006	0.004	*0.001*	0.004	0.003
Dissolved Arsenic	mg/L	0.01	0.006	0.006	0.004	0.004	0.001	0.002		*0.0005*	0.02	0.021
Dissolved Boron	mg/L	1.4	0.15	0.05	0.08	0.09	0.07	0.04	0.64	0.07	0.05	0.03
Dissolved Cadmium	mg/L	0.004	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*
Dissolved Chromium (VI)	mg/L	0.05	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*
Dissolved Copper	mg/L	2	*0.00025*	0.0007	*0.00025*	0.0013	*0.00025*	0.002	*0.00025*	*0.00025*	*0.00025*	*0.00025*
Dissolved Iron	mg/L	0.2*	0.034	0.024	0.013	0.046	0.065	0.12		0.076	0.035	0.022
Dissolved Lead	mg/L	0.01		*0.00025*		*0.00025*		0.0014		*0.00025*		*0.00025*
Dissolved Manganese	mg/L	0.4		0.22		**0.69**		**0.45**		**0.58**		**0.49**
Dissolved Mercury	mg/L	-		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*
Dissolved Nickel	mg/L	0.08		*0.00025*		*0.00025*		0.0005		*0.00025*		*0.00025*
Dissolved Zinc	mg/L	1.5*		0.006		0.005		0.014		*0.001*		*0.001*

Notes:

Bold –denotes an exceedance of the DWSNZ MAV

Underlined – denotes exceedance of the Consent Trigger Value.

'ND' indicates where *E. coli* were not detected at or above the laboratory detection limit

All `<' values have been reported as half the detection limit for statistical purposes and are expressed in italics

n/r – not required to be tested during this monitoring period

Sampling date not provided in report, but assumed from other data.

2.4 Impact of Old Landfill on Groundwater Quality

Water sampling is carried out to characterise the groundwater quality in a series of shallow bores situated hydraulically down-gradient from the old unlined landfill.

The Series B boreholes are located within 50m of the old landfill in a line along its northern edge.

The Series C boreholes are located further down the hydraulic gradient from the old landfill towards Hokio Beach Road to detect whether leachate is moving off site.

Borehole E2S is located northwest of the old landfill to detect any leachate moving directly towards the nearest house down-stream of the site.

Bore G2S was installed in late 2009 and is located to the north of the landfill site, hydraulically down-gradient of the old landfill by Hokio Road and the entrance road to the landfill.

Bores Xs1 and Xs2 are located along Hokio Beach Road, within the road reserve. Bore Xs1 is adjacent to the Northern Farm property and bore Xs2 is next to the driveway leading to a Council-owned property. Bore Xs2 is hydraulically upgradient of the old landfill (See Site Plan, Appendix A).

The results from the April/June 2023 consent monitoring rounds for these bores are presented in Table 2-5 and have been compared with the ANZECC LDW trigger values as per the requirements of discharge consent ATH-2002003983.02. The full laboratory report is included in Appendix C and the historical graphs are presented in Appendix D.

There was **one exceedance of the ANZECC LDW trigger values** during the April/June 2023 monitoring round, as follows:

- The *E. coli* count exceeded the ANZECC LDW trigger value of 100 cfu/100ml at bore C2 (6,000 cfu/100mL) in April 2023. In the January 2023 monitoring round, bores B1, B2, C2 also presented significant exceedances. Elevated *E. coli* at C2 has been observed historically, but this is the highest recorded level since monitoring began in February 1994. Whilst not exceedances, bores B2 and C2DS presented values of 100 cfu/100mL in April 2023 – at the trigger threshold.

Table 2-5: Monitoring Results for Shallow Boreholes Down-Gradient from the Old Landfill for April/June 2023

Determinant	Units	ANZECC LDW	E2S		B1		B2		B3S		C1		C2		C2DS		G2S		Xs1		Xs2	
Sampling date			05/04/23	14/06/23	05/04/23	15/06/23	05/04/23	15/06/23	05/04/23	15/06/23	05/04/23	15/06/23	05/04/23	13/06/23	05/04/23	13/06/23 [#]	04/04/23	12/06/23	06/04/23	13/06/23	06/04/23	13/06/23
Water Level	mbgl	-	5.37	5.1	0.94	0.05	1.17	0.7	0.23	0.05	0.64	0.84	0.2	0.3	2.73	2.3	2.19	2.03	0.68	0.26	2.7	2.07
pH	pH units	6 to 9		7.7		7.7		7.2		7		7		7.2		7.2		7.3		6.7		6.7
Suspended Solids	mg/l	-		13		5		7		84		517		84		116		14		35		21
Phenol	mg/l	-		*0.025*		*0.025*		*0.025*		*0.025*		*0.025*		*0.025*		0.025		*0.025*		*0.025*		*0.025*
VFA	mg/l	-		*2.5*		*2.5*		*2.5*		*2.5*		*2.5*		*2.5*		*2.5*		*2.5*		*2.5*		*2.5*
TOC	mg/L	-		2.2		24.3		29.5		54.1		23.6		41.2		26.8		7.2		31.6		1.8
Alkalinity	mg CaCO3/L	-	90	97	707	568	653	553	1040	997	353	352	1140	669	497	635	259	217	590	373	48	60
Conductivity	mS/m	-	33.8	33.8	247	238	250	198	244	251	119	119	279	251	115	158	157	93.3	142	92.1	20	20.2
COD	mg/L	-	30	20	90	45	92	105	133	129	73	85	133	107	65	78	27	31	87	78	*7.5*	*7.5*
scBOD5	mg/L	-	*3*	*0.5*	*3*	*0.5*	*3*	*0.5*	*3*	*2*	*3*	*3*	*3*	*2*	*3*	6	*1.5*	*0.5*	*1.5*	*1*	*1.5*	*0.5*
E. coli	CFU/100ml	100	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	**6000**	ND	100	ND	ND	ND	ND	ND	ND	ND
Chloride	mg/L	-	38.9	40.7	399	386	195	194	135	139	155	147	171	151	85.9	97.1	342	146	114	56.1	18.9	14.9
Nitrate-N	mg/L	90.3		*0.005*		17.4		32.1		0.37		*0.005*		*0.05*		*0.05*		*0.005*		*0.005*		0.82
Sulphate	mg/L	1000		10.1		4.77		17.6		0.15		22.1		0.39		0.16		6.33		6.04		11.9
Ammoniacal-N	mg/L	-	0.08	0.3	9.08	6.39	79.2	102	127	116	11.4	11.6	166	171	1.37	76.6	0.03	0.02	10.9	12.5	0.03	0.02
Hardness	mg CaCO3/L	-		84		451		463		487		233		240		251		115		292		61
Calcium	mg/L	1000	24.7	23.6	82.3	82.1	134	117	69.1	82.7	44.6	44.30	58.2	48.7	101	59.2	64.5	21.7	85.4	73.1	10.9	13.1
Magnesium	mg/L	-		6.15		59.8		41.5		68.1		29.70		28.7		24.9		14.9		26.6		6.74
Potassium	mg/L	-		5.09		21.3		70.9		83		25.8		70.8		33.1		13.3		12.6		4.8
Sodium	mg/L	-		30.1		304		104		120		120		128		92.5		126		52.3		14.1
D.R. Phosphorus	mg/L	-	0.29	0.25	0.12	0.095	0.012	0.013	0.022	0.03	0.01	0.01	0.011	0.018	0.015	0.017	0.012	0.019	0.011	0.029	0.011	0.016
Dissolved Aluminium	mg/L	5	0.021	0.007	0.011	0.007	0.007	0.007	0.006	0.004	0.03	0.02	0.018	0.011	0.004	0.004	0.002	*0.001*	0.005	0.005	0.007	0.013
Dissolved Arsenic	mg/L	0.5	0.003	*0.0005*	0.001	0.001	0.002	0.001	0.021	0.016	0.001	0.001	0.002	0.001	0.001	0.001	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*
Dissolved Boron	mg/L	5	0.16	*0.015*	2.08	1.84	2.36	2.05	0.98	1.01	0.99	1.02	1.63	1.54	0.76	0.89	0.6	0.6	0.61	0.22	0.06	0.04
Dissolved Cadmium	mg/L	0.01	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*
Dissolved Chromium (VI)	mg/L	1	*0.0005*	*0.0005*	0.002	0.001	0.001	0.001	0.003	0.004	*0.0005*	*0.0005*	0.002	0.002	*0.0005*	0.001	*0.0005*	*0.0005*	0.001	*0.0005*	*0.0005*	*0.0005*
Dissolved Copper	mg/L	0.4	0.017	*0.00025*	0.018	0.012	0.0028	0.0035	0.015	0.0021	0.0046	0.0028	0.0006	0.0019	*0.00025*	0.0009	0.003	0.0042	*0.00025*	*0.00025*	0.0014	0.0008
Dissolved Iron	mg/L	-	0.5	0.082	0.075	0.055	0.25	0.31	0.52	0.86	0.57	0.41	0.9	0.64	2.14	0.42	0.036	0.26	1.1	6.42	0.13	0.041
Dissolved Lead	mg/L	0.1		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*
Dissolved Manganese	mg/L	-		0.24		4.8		3.56		3.57		0.31		0.19		0.79		0.084		1.61		0.041
Dissolved Mercury	mg/L	0.002		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*		*0.00025*
Dissolved Nickel	mg/L	1		*0.00025*		0.0048		0.0024		0.0086		0.001		0.0039		0.0025		0.0018		0.0008		*0.00025*
Dissolved Zinc	mg/L	20		*0.001*		0.006		0.003		*0.001*		*0.001*		0.009		0.007		*0.001*		*0.001*		*0.001*

Notes:

All `<' values represent a non-detection and have been reported as half the detection limit for statistical purposes and are expressed in italics

'ND' indicates where *E. coli* were not detected at or above the laboratory detection limit

n/r – not required to be tested during this monitoring period

n/p – result not provided at the time of preparing this report

Bold - denotes exceedance of ANZECC LDW

[#] Sampling date not provided in report, but assumed from other data.

2.5 Groundwater Quality Down-Gradient of the Irrigation Area

The F-series boreholes intersect the shallow aquifer down-gradient of the area that was used to irrigate leachate from 2004 to October 2008. All leachate is now pumped to the Levin Wastewater Treatment Plant. The F1 borehole is located within the area where leachate from the new landfill was irrigated. The F2 and F3 boreholes are in an area that was set aside for leachate irrigation but was never used for that purpose. It is expected that bores F2 and F3 would therefore be representative of background groundwater quality.

The results from the F series boreholes are presented in Table 2-6 and have been compared with the ANZECC LDW trigger values, as per discharge consent ATH-2002003983.02. The full laboratory report is included in Appendix C and the historical graphs are presented in Appendix D.

There were **no exceedances of the resource consent conditions** in samples from these bores during the April and June 2023 monitoring rounds.

Table 2-6: Results from Monitoring Bores in the Irrigation Area for April/June 2023

Determinant	Units	ANZECC LDW	F1		F2		F3	
Sampling Date			04 April 2023	12 June 2023	04 April 2023	12 June 2023[#]	04 April 2023	12 June 2023[#]
Water Level	mbgl	-	7.46	7.1	2.19	1.9	4	4.2
pH	pH units	6 to 9		7.7		7.1		7.1
Suspended Solids	mg/l	-		*2.5*		6		*2.5*
Phenol	mg/l	-		*0.025*		*0.025*		*0.025*
VFA	mg/l	-		*2.5*		*2.5*		*2.5*
TOC	mg/L	-		6.4		1.8		1.3
Alkalinity	mg CaCO3/L	-	146	149	59	60	56	57
Conductivity	mS/m	-	41.2	42	22.4	22.3	18.3	18.6
COD	mg/L	-	28	25	*7.5*	*7.5*	*7.5*	*7.5*
scBOD5	mg/L	-	*1.5*	*0.5*	*1.5*	*0.5*	*1.5*	*0.5*
E. coli	CFU/100ml	100	ND	ND	ND	ND	ND	ND
Chloride	mg/L	-	37.4	40.1	24	24	16.1	16.4
Nitrate-N	mg/L	90.3		0.6		0.31		0.99
Sulphate	mg/L	1000		2.18		10.7		4.91
Ammoniacal-N	mg/L	-	0.02	*0.005*	0.01	*0.005*	*0.005*	*0.005*
Hardness	mg CaCO3/L	-		122		40		32
Calcium	mg/L	1000	16.7	17.5	6.47	6.21	4.67	4.76
Magnesium	mg/L	-		19.1		5.85		4.92
Potassium	mg/L	-		8.71		5.44		4.88
Sodium	mg/L	-		35.4		26.7		23
D.R. Phosphorus	mg/L	-	0.17	0.17	0.13	0.12	0.15	0.15
Dissolved Aluminium	mg/L	5	*0.001*	*0.001*	0.002	*0.001*	0.002	*0.001*
Dissolved Arsenic	mg/L	0.5	0.002	0.002	0.001	0.001	0.001	0.002
Dissolved Boron	mg/L	5	0.04	0.04	0.04	0.05	0.03	0.04
Dissolved Cadmium	mg/L	0.01	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*
Dissolved Chromium (VI)	mg/L	1	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*

Determinant	Units	ANZECC LDW	F1		F2		F3	
Dissolved Copper	mg/L	0.4	0.0018	0.0027	0.0006	0.0012	*0.00025*	*0.00025*
Dissolved Iron	mg/L	-	*0.0025*	*0.0025*	0.026	0.013	*0.0025*	*0.0025*
Dissolved Lead	mg/L	0.1		*0.00025*		*0.00025*		*0.00025*
Dissolved Manganese	mg/L	-		0.0057		0.0078		*0.00025*
Dissolved Mercury	mg/L	0.002		*0.00025*		*0.00025*		*0.00025*
Dissolved Nickel	mg/L	1		0.0005		*0.00025*		*0.00025*
Dissolved Zinc	mg/L	20		*0.001*		*0.001*		*0.001*

Notes:

All `<' values have been reported as half the detection limit for statistical purposes and are *expressed in italics*

'ND' indicates where *E. coli* were not detected at or above the laboratory detection limit

n/r – not required to be tested during this monitoring period

[#] Sampling date not provided in report, but assumed from other data.

2.6 Leachate Effluent Results

Leachate effluent from the landfill is not subject to any water quality consent conditions and is sent to the Levin Wastewater Treatment Plant for treatment. However, for comparison purposes, typical leachate characteristics for landfills, as published by the Waste Management Institute New Zealand (*Technical Guidelines for Disposal to Land*, October 2022, WasteMINZ), have been compared against the leachate quality monitoring results (Table 2-9). The full laboratory report is included in Appendix C and the historical graphs are presented in Appendix D

As stated, typical leachate concentrations are derived from tables presented in the WasteMINZ *Technical Guidelines*. The data in those tables originate from seven landfills in New Zealand and date back to between 1998 and 1999. In future, more updated data could be sought for comparison purposes.

Table 2-7 shows that the concentrations of monitored parameters for leachate effluent samples collected in April and June 2023 were mostly within the typical ranges to be expected for this type of landfill.

Up until April 2022, samples of leachate were tested monthly for the comprehensive suite of parameters, as stated in Table C under condition 3H of discharge permit ATH-2002003983.02. This requirement was for 2 years and condition 3P of discharge permit ATH-2002003983.02 allows the monitoring frequency to shift to a conditional sampling frequency (i.e., six monthly comprehensive, quarterly indicator) if water sample analysis results are consistent and there is no decline in water quality over a period of at least four consecutive sampling rounds. The quality of leachate is considered to have met these criteria and so the change in monitoring from April 2022 was justified. The resource consent conditions allowed this change to occur immediately after the four consecutive sampling rounds were completed.

There were **seven outliers from the typical leachate characteristics in the April/June 2023 results**. In April 2023, conductivity, dissolved iron, lead, mercury, and nickel were all detected below their minimum typical value ranges (or not detected at all). In June 2023, Ammonia-N was detected at an elevated level, and dissolved mercury was not detected, and again thus below its minimum typical value.

The results reported here are generally consistent with those previously reported for leachate monitoring. However, leachate at this site is usually considerably more conductive – besides April 2023, the next lowest conductivity recorded was obtained in December 2020.

Table 2-7: Results from Leachate Effluent Monitoring for April/June 2023

Determinant	Units	Typical Leachate Characteristics* (range)	06 April 2023 Result	13 June 2023 Result
pH		5.9 - 8.5	7.7	7.5
Suspended Solids	mg/l	-	124	29
Phenol	mg/L	-		*0.025*
VFA	mg/L	-		*2.5*
TOC	mg/L	-	79.4	769
Alkalinity	mg $CaCO_3$/L	-	377	6,160
Conductivity	mS/m	264 – 27,900	**130**	1,640
COD	mg/L	84 – 5,090	389	2,830
$scBOD_5$	mg/L	-	*3*	98
E-Coli	CFU/100mL	-	400	*50*
Chloride	mg/L	45 – 2,584	165	1,240
Nitrate-N	mg/L	-	0.01	*0.5*
Sulphate	mg/L	-	8.76	17.4
Ammonia-N	mg/L	3.4 – 1,440	33.6	**1,590**
Hardness	mg $CaCO_3$/L	-	72	474
Calcium	mg/L	-	16.3	95.6
Magnesium	mg/L	-	7.56	57
Potassium	mg/L	-	92	634

Determinant	Units	Typical Leachate Characteristics* (range)	06 April 2023 Result	13 June 2023 Result
Sodium	mg/L	50 – 4,000**	140	1,070
D.R. Phosphorus	mg/L	-	0.393	14.2
Dissolved Aluminium	mg/L	-	0.054	0.716
Dissolved Arsenic	mg/L	-	0.041	0.255
Dissolved Boron	mg/L	0.54 – 20.1	0.99	4.36
Dissolved Cadmium	mg/L	-	*0.0001*	0.0013
Dissolved Chromium	mg/L	-	0.065	0.763
Dissolved Copper	mg/L	-	*0.00025*	0.0122
Dissolved Iron	mg/L	1.6 – 220	**0.286**	6.38
Dissolved Lead	mg/L	0.001 - 0.42	***0.00025***	0.0051
Dissolved Manganese	mg/L	0.03 - 45***	0.199	1.16
Dissolved Mercury	mg/L	0.2 – 50	***0.00025***	***0.00025***
Dissolved Nickel	mg/L	0.02 – 2.05**	**0.0089**	0.107
Dissolved Zinc	mg/L	-	0.002	0.196

Notes:

* for Class 1-type landfills, Table 5-5, p60, Technical Guidelines for Disposal to Land, WasteMINZ October 2022 (same as Table 4.2 of the CAE Landfill Guidelines 2000, but corrections made to Table 5-5 in line with Table 4.2)

**Data taken from Table 5-4, p59 of the same guideline, for parameters for which no differences in concentrations between the phases of landfill development could be observed

***Data taken from Table 5-4, p59 of the same guideline, for parameters during the methanogenic phase

Bold – denotes a deviation from the typical leachate characteristics range

All `<' values have been reported as half the detection limit for statistical purposes and are expressed in italics

'ND' indicates where *E. coli* and other parameters were not detected at or above the laboratory detection limit

n/r – not required to be tested during this monitoring period

2.7 Northern Farm Drain (Tatana Property)

A drain is located on the Northern Farm, previously known as the Tatana Property (see Site Plan in Appendix A). Since July 2015 HDC has agreed to sample surface water from this drain for a selection of parameters that were set by HRC. Four sampling points were selected to represent the top of the drain (SW1), middle of the drain (SW2 and SW3) and lower drain (SW4) respectively.

The revised consent conditions have since reduced the extent of sampling to a single location. This is known as 'TD1' and is the same sampling location as for the previously denoted 'SW3'.

Results from the February 2023, March 2023, and April 2023 sampling rounds are presented in Table 2-8 and have been compared with the ANZECC[3] 95%ile DGVs, as per the revised resource consent conditions.

There have been **nine exceedances of the resource consent conditions** for three monitored parameters in samples from the Northern Farm Drain at the TD1 location during the February 2023, March 2023, and April 2023 sampling rounds. These exceedances are as follows:

- $scBOD_5$ exceeded the ANZECC (95%ile) DGV of 2 mg/L across all dates with a value of *3* mg/L – half the detection limit of 6 mg/L. This emphasises the importance of a detection limit below the standard at which a parameter is assessed – if the detection limit was reduced, these results may have been compliant, but currently have to be considered exceedances.
- The concentration of Nitrate-N exceeded the ANZECC (95%ile) DGV of 0.16 mg/L in February 2023 (0.57 mg/L), March 2023 (0.7 mg/L), and April 2023 (0.25 mg/L). This site has commonly presented elevated Nitrate-N levels.

[3]Australian and New Zealand Guidelines for Fresh and Marine Water Quality - Aquatic Ecosystems (AE), Australian and New Zealand Environment and Conservation Council (ANZECC), Canberra, Australia, 2000

- The concentration of Ammoniacal-N exceeded the ANZECC (95%ile) DGV of 2.1 mg/L in February 2023 (6.37 mg/L), March 2023 (11.7 mg/L), and April 2023 (7.77 mg/L).

Whilst relatively high, these results are not uncharacteristic of results within the last two years. Localised conditions, such as having stock in the paddock next to Tatana Drain and the slow flow of water in the drain, may contribute to some of the elevated parameters.

Table 2-8 Northern Farm Drain Monitoring Results for February 2023, March 2023, and April 2023.

Determinant	Units	ANZECC DGV (95%ile species protection)	TD1 (formerly SW3)		
			February	March	April
Sampling date			16/02/2023	08/03/2023	06/04/23
pH	pH units	-	7.7	7.5	8.0
Suspended Solids	mg/L	-	25	136	23
Phenol	mg/L	-	*0.025*	*0.025*	*0.025*
VFA	mg/L	-	*2.5*	*2.5*	*2.5*
TOC	mg/L	-	29	23.6	15.9
Alkalinity	mg $CaCO_3$/L	-	237	326	212
Conductivity	mS/m	-	81.5	95.2	65.9
COD	mg/L	-	106	132	83
$scBOD_5$	mg/L	2	***3***	***3***	***3***
E-Coli	CFU/100ml	-	9,000	5,500	ND
Chloride	mg/L	-	103	87.5	68.5
Nitrate-N	mg/L	0.16	**0.57**	**0.7**	**0.25**
Sulphate	mg/L	-	4.88	1.45	2.36
Ammoniacal-N	mg/L	2.1	**6.37**	**11.7**	**7.77**
Hardness	mg $CaCO_3$/L	-	175	225	140
Calcium	mg/L	-	33.9	52.2	26.3
Magnesium	mg/L	-	22	23.1	18.0
Potassium	mg/L	-	33.1	21.5	21.1
Sodium	mg/L	-	79.4	69.2	62.4
D.R. Phosphorus	mg/L	-	0.026	0.034	0.018
Dissolved Aluminium	mg/L	0.055	0.02	0.008	0.015
Dissolved Arsenic	mg/L	0.024	0.001	*0.0005*	*0.0005*
Dissolved Boron	mg/L	-	0.56	0.25	0.31
Dissolved Cadmium	mg/L	0.0002	*0.0001*	*0.0001*	*0.0001*
Dissolved Chromium	mg/L	-	0.001	0.001	*0.0005*
Dissolved Copper	mg/L	0.0014	0.0008	0.0007	0.0007
Dissolved Iron	mg/L	-	1.04	0.25	0.46
Dissolved Lead	mg/L	0.0034	*0.00025*	*0.00025*	*0.00025*
Dissolved Manganese	mg/L	1.9	0.266	0.584	0.086
Dissolved Mercury	mg/L	0.0006	*0.00025*	*0.00025*	*0.00025*
Dissolved Nickel	mg/L	0.011	0.0022	0.0014	0.0014
Dissolved Zinc	mg/L	0.008	0.004	0.005	0.0060

Notes:
Bold – denotes an exceedance of the ANZECC DGV for 95%ile species protection
All `<' values have been reported as half the detection limit for statistical purposes and are expressed in italics

2.8 Hokio Stream

Surface water grab samples are obtained monthly from Hokio Stream at sites HS1A, HS1, HS2 and HS3 (refer to Appendix A) to investigate whether groundwater containing leachate is having an adverse environmental effect on the stream. Sites HS1A and HS1 are situated up-stream of the old landfill, HS2 is situated alongside the old landfill and up-stream of the Tatana Property Drain discharge, and HS3 is located approximately 50m down-stream of the landfill site property boundary and the Tatana Property Drain discharge. Samples from these monitoring locations on Hokio Stream are analysed for a comprehensive suite of parameters every month (as shown in Appendix B).

Results from the February 2023, March 2023, and April 2023 monitoring rounds are presented in Table 2-9 and have been compared with the ANZECC AE 95%ile DGVs, as per the revised resource consent conditions (2019).

Monitoring for $scBOD_5$ and soluble mercury concentrations has now been added as per the revised Resource Consent conditions.

There were **sixteen exceedances** of the resource consent conditions in samples from the Hokio Stream during the February 2023, March 2023, and April 2023 sampling rounds.

The exceedances are summarised as follows:

- $scBOD_5$ exceeded the ANZECC (95%ile) DGV of 2 mg/L at all sites in February 2023 and March 2023, with a consistent value of *3* mg/L – half the detection limit of 6 mg/L. This emphasises the importance of a detection limit below the standard at which a parameter is assessed – if the detection limit was reduced, these results may have been compliant, but currently must be considered exceedances. It is noted that for April 2023 monitoring, the detection limit was 3 mg/L.
- Nitrate-N concentrations exceeded the ANZECC (95%ile) DGV and consent trigger value of 0.16 mg/L in February 2023, March 2023, and April 2023 at HS2 and HS3. N-Nitrate exceedances are not unusual at these sites.
- Ammoniacal-N exceeded the ANZECC (95%ile) DGV and consent trigger value of 2.1 mg/L at HS2 (3.67 mg/L) in March 2023.
- Dissolved aluminium exceeded the ANZECC (95%ile) DGV and consent trigger value of 0.055 mg/L in February 2023 at HS1A with a value of 2580 mg/L. This result is significantly concentrated, and is the greatest level recorded across all Hokio Stream sites (by a considerable amount), since monitoring began. This should be investigated further, to determine if this is erroneous or a true result. It is noted that downstream results in February were not significantly elevated, which implies that this is an error.

Overall, the differences in monitoring results between the sites are generally marginal and for most determinants there is little to no change in concentrations between upstream and downstream sites on the Hokio Stream. Nitrate-N, Ammoniacal-N and dissolved aluminium provided exceptions to this trend. Nitrate-N appeared to increase downstream, whereas Ammoniacal-N and dissolved aluminium presented localised increases with no downstream effect. Monitoring for dissolved aluminium should continue in future to assess whether the exceedance is anomalous. *E. coli* counts differ significantly between sites and sampling rounds. However, the *E. coli* counts noted in this report are generally within the historical range since sampling began in 1994. The one exception was the result at HS1A in April 2023, which was the highest recorded at the site since monitoring began in April 2020.

Table 2-9: Hokio Stream Monitoring Results for February 2023, March 2023, and April 2023.

Determinant	Units	ANZECC DGV (95%ile species protection)	Consent Trigger Values (Table C1)	HS1A (from April 2020)	HS1	HS2	HS3	HS1A (from April 2020)	HS1	HS2	HS3	HS1A (from April 2020)	HS1	HS2	HS3
				February 2023				March 2023				April 2023			
Sampling date				16/02/23	16/02/23	16/02/23	16/02/23	08/03/23	08/03/23	08/03/23	08/03/23	13/04/23	13/04/23	13/04/23	13/04/23
pH	pH units	-	-	8.6	8.6	7.8	8.3	7.7	7.8	7.2	7.5	7.4	7.6	7.5	7.5
Suspended Solids	mg/l	-	-	35	26	36	27	39	6	87	21	12	8	40	8
Phenol	mg/l			*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*
VFA	mg/l			*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
TOC	mg/L	-	-	8.4	8.3	12.7	8.2	7	7.1	14.1	6.8	6.8	7.1	6.9	7
Alkalinity	mg $CaCO_3$/L	-	-	61	62	94	66	47	59	111	64	59	60	59	63
Conductivity	mS/m	-	-	20.9	21.1	35.2	22.8	21.8	22.1	39.9	24.4	23.2	22.6	23.1	23.3
COD	mg/L	-	-	53	57	68	70	44	33	60	33	28	18	25	20
$scBOD_5$	mg/L	2	Monthly Avg. 2	***3***	***3***	***3***	***3***	***3***	***3***	***3***	***3***	*1.5*	*1.5*	*1.5*	*1.5*
E. coli	CFU/100 ml	-	-	900	1000	1000	1500	ND	100	100	ND	5400	ND	500	400
Chloride	mg/L	-	-	22.7	23	38.6	25.2	23.6	23.2	48.7	25.9	23.1	23.9	23.9	24.1
Nitrate-N	mg/L	0.16	0.16	0.07	0.07	**0.19**	**0.16**	0.15	0.14	**0.26**	**0.25**	0.14	0.13	**0.2**	**0.22**
Sulphate	mg/L	-	-	18.1	18.1	14.7	17.9	16.4	16	9.38	15.7	14.5	14.9	15.3	15.3
Ammoniacal-N	mg/L	2.1	Max. 2.1 Avg. 0.400	0.02	0.04	1.23	0.14	0.07	0.12	**3.67**	0.15	0.04	0.02	0.02	0.04
Hardness	mg $CaCO_3$/L	-	-	51	49	75	54	58	58	134	66	65	62	67	64
Calcium	mg/L	-	-	10.8	10.4	15.4	11.5	12.4	12.4	29	14.3	12.2	11.7	12.8	12.3
Magnesium	mg/L	-	-	5.9	5.56	8.83	6.06	6.68	6.66	14.9	7.34	8.3	7.96	8.42	8.03
Potassium	mg/L	-	-	1.68	1.06	7.62	2.41	1.95	1.86	11.2	2.33	2.45	2.47	2.66	2.71
Sodium	mg/L	-	-	21.8	20.7	31.4	21.8	25.2	25.2	49.2	26.9	20.8	19.4	20.3	19.6
D.R. Phosphorus	mg/L	-	-	0.2	0.21	0.14	0.2	0.4	0.37	0.16	0.32	0.3	0.278	0.27	0.26
Dissolved Aluminium	mg/L	0.055	Med. 0.055	**2580**	0.019	0.023	0.018	0.011	0.011	0.009	0.008	0.025	0.013	0.017	0.015

Determinant	Units	ANZECC DGV (95%ile species protection)	Consent Trigger Values (Table C1)	HS1A (from April 2020)	HS1	HS2	HS3	HS1A (from April 2020)	HS1	HS2	HS3	HS1A (from April 2020)	HS1	HS2	HS3
				February 2023				March 2023				April 2023			
Dissolved Arsenic	mg/L	0.024	Med. 0.024	0.003	*0.0005*	0.002	0.003	0.004	0.004	0.002	0.004	0.003	0.003	0.003	0.003
Dissolved Boron	mg/L	0.370	-	0.05	0.05	0.14	0.06	0.06	0.05	0.15	0.06	0.07	0.07	0.08	0.08
Dissolved Cadmium	mg/L	0.0002	Med. 0.0002	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*
Dissolved Chromium (VI)	mg/L	0.001	-	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*
Dissolved Copper	mg/L	0.0014	Med. 0.0014	0.001	0.0008	0.0009	0.0009	0.0009	0.0008	0.0006	0.0008	0.0014	0.001	0.001	0.0013
Dissolved Iron	mg/L	-	-	0.098	0.074	0.32	0.11	0.15	0.16	0.31	0.15	0.12	0.1	0.14	0.12
Dissolved Lead	mg/L	0.0034	Med. 0.0034	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*
Dissolved Manganese	mg/L	1.9	-	0.0098	0.0054	0.031	0.014	0.015	0.018	0.12	0.03	0.021	0.018	0.02	0.023
Dissolved Mercury	mg/L	0.0006	Med. 0.0006	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*	*0.00025*
Dissolved Nickel	mg/L	0.011	Med. 0.011	*0.00025*	*0.00025*	0.0007	*0.00025*	0.0006	*0.00025*	0.0008	0.002	0.0006	*0.00025*	*0.00025*	*0.00025*
Dissolved Zinc	mg/L	0.008	Med. 0.008	*0.001*	*0.001*	*0.001*	*0.001*	0.006	*0.001*	*0.001*	0.002	0.007	0.003	0.002	0.004

Notes:

Bold – denotes an exceedance of the ANZECC AE 95% protection level trigger values

Underlined – denotes exceedance of the Consent Trigger Value.

All `<' values have been reported as half the detection limit for statistical purposes and are expressed in italics

3 Landfill Gas Detection in Monitoring Wells

Condition 4 of Discharge Permit ATH-2002003984.02 requires that: "…*groundwater monitoring wells shall be sampled for landfill gas when groundwater samples are taken from the wells. As a minimum, sampling shall be undertaken for methane, carbon dioxide and oxygen…*"

In the past, landfill gas monitoring results were only reported in the Annual Report. A recommendation of the 2019 - 2020 Annual Report was that these results should be included in every quarterly monitoring report so that if any results are unusually high, appropriate action can be promptly undertaken, including putting safeguards in place at the monitoring bores.

Appendix E summarises the results of landfill gas monitoring undertaken on 3 April 2023 and 8/9 June 2023. It is noted that in June 2023, one additional and unlabelled gas sample was taken. It is not known what bore this pertains to.

Out of the 27 groundwater monitoring bores:

- Methane was detected in eleven of the bores in April 2023, and eight of the bores in June 2023 – including the unlabelled sample. In April 2023, the highest recorded level was 0.12% in bore D6, with the other bores ranging from 0.01 – 0.09%. In June 2023, the highest recorded level was again 0.12% in bore D6, with the other bores ranging from 0.01 – 0.03%. These results are well below the lower explosive limit of 5% and is therefore deemed to represent a 'safe' level. However, the detection of methane reinforces the need for the necessary precautions generally applicable at landfill sites to be taken when conducting sampling.

- In April 2023, landfill bore B2 showed the highest carbon dioxide level of 1.48% - a considerable decrease from the previous quarter. This bore has demonstrated such fluctuations historically. However, this result is still somewhat higher than all other bores – the next highest being 0.52%. In June 2023, bore C1 presented a significant concentration of 20.2%. This result appears to be very uncharacteristic and should be investigated further. The next greatest concentration of CO_2 for June 2023 was 1.5% at G2s.

- Hydrogen sulphide was detected one bore – G1s (1 ppm) in April 2023, which is around the threshold at which a 'rotten egg' smell (commonly associated with H_2S) can be detected. Hydrogen sulphide was not detected at any sites in June 2023.

- The landfill gas levels in April/June 2023 appear to be slightly variable compared to the previous quarter and reinforce the importance of continuing to monitor these changes and map any patterns. The results may be due to seasonal variations (e.g., different ground temperatures and/or groundwater levels), or may be related to prevailing weather conditions (e.g., different air pressures).

The possibility of encountering methane (and possible hydrogen sulphide) in groundwater bores endorses the need for appropriate health and safety measures to be adopted during monitoring, as is the case for the landfill gas extraction wells. No smoking should be permitted when personnel undertake groundwater sampling and when in the vicinity of the groundwater monitoring wells, or in fact anywhere else on the Levin Landfill site. For sake of safety a personal gas detector should be worn by all staff when working in the vicinity of the landfill.

4 Sampling Quality Control and Assurance

4.1 Sampling Quality Control and Assurance

The landfill extends over a significant area and there are many sampling locations. However, it is important that the time span of the sampling period is kept as short as possible because more infrequent (or erratic) sampling can make it difficult to compare results between rounds and determine trends at individual monitoring locations.

Whilst the surface water and groundwater samples were collected within 7-day periods during April and June, most of the samples were received by the laboratory outside the normally accepted 24-hour timeframe between sampling and reception. Meeting the monitoring timeframe is important because it means that there can be greater confidence in reliability of results, and comparisons with historical data.

The level of detection used in the laboratory for testing *E. coli* was set at 100 CFU/100ml for most samples. 100 CFU/100ml as the level of detection is not conducive to assessing compliance with the resource consent conditions, as the ANZECC LDW is also set at 100 CFU/100ml and the DWSNZ MAV is 'NIL'. Checks should be undertaken by the sampling personnel before submitting samples for analysis, including on the Chain of Custody documentation, to ensure that the correct tests are requested and performed, with appropriate limits of detection.

5 Consent Compliance

Discharge permit ATH-2002003983.02 states that quarterly and annual monitoring results for the shallow groundwater aquifer (sand aquifer) shall comply with the ANZECC LDW trigger values, and samples from the deep groundwater (gravel aquifer) shall comply with the applicable DWSNZ values. Furthermore, samples taken from surface water bodies shall comply with ANZECC AE 95%ile DGVs. Should any parameters exceed these standards, the permit holder shall report to the Regional Council as soon as practicable on the significance of the results and, where the change can be attributed to the influence of landfill leachate, consult with the Regional Council to determine if further investigations or remedial measures are required.

Background Groundwater Quality

The quality of the natural background groundwater up-gradient from the landfill site is not subject to any consent conditions.

Shallow Aquifer and Irrigation Area

There were **no exceedances** of consent conditions hydraulically up-gradient of the old landfill and down-gradient of the new landfill during the April/June 2023 monitoring period.

There was **one exceedance** of consent conditions hydraulically down-gradient of the old landfill during the April/June 2023 monitoring round, as follows:

- The *E. coli* count exceeded the ANZECC LDW trigger value of 100 cfu/100ml at bore C2 (6,000 cfu/100mL) in April 2023. In the January 2023 monitoring round, bores B1, B2, C2 also presented significant exceedances. Elevated *E. coli* at C2 has been observed historically, but this is the highest recorded level since monitoring began in February 1994.

There were **no exceedances** of consent conditions during the April/June 2023 sampling round for samples obtained from bores within the irrigation area.

Deeper Gravel Aquifer

There were **six exceedances** of consent conditions in samples from the deep gravel aquifer during the April/June 2023 monitoring round, as follows:

- *E. coli* in bore E2D exceeded the DWSNZ MAV of NIL with a value of 38 cfu/100mL in June 2023.
- Hardness in bore D3rd (201 mg $CaCO_3$/L) exceeded the DWSNZ MAV of 200 mg $CaCO_3$/L in June 2023. Elevated hardness is characteristic of D3rd.
- The dissolved manganese concentrations in bores C2DD (0.69 mg/L), E2D (0.45 mg/L), Xd1 (0.58 mg/L) and D3rd (0.49 mg/L) exceeded the DWSNZ MAV of 0.4 mg/L in June 2023. The results for C2DD (from 1997), E2D (from 1997), Xd1 (from March 2021 when sampling started) and D3rd (from October 2021 when sampling started) are within the historical range of concentrations observed. Dissolved manganese is generally elevated in the deep aquifer bores.

Leachate Effluent

Leachate effluent from the Levin Landfill is not subject to any water quality consent conditions and is sent to the Levin Wastewater Treatment Plant for treatment.

However, there were seven outliers from the typical leachate characteristics in the April/June 2023 results. In April 2023, conductivity, dissolved iron, lead, mercury, and nickel were all detected below their minimum typical value ranges (or not detected at all). In June 2023, Ammonia-N was detected at an elevated level, and dissolved mercury was not detected, and again thus below its minimum typical value.

Northern Farm Drain

There have been **nine exceedances** of consent conditions for three monitored parameters in samples from the Northern Farm Drain at the TD1 location during the February 2023, March 2023, and April 2023 sampling rounds. These exceedances are as follows:

- $scBOD_5$ exceeded the ANZECC (95%ile) DGV of 2 mg/L across all dates with a value of *3* mg/L – half the detection limit of 6 mg/L.
- The concentration of Nitrate-N exceeded the ANZECC (95%ile) DGV of 0.16 mg/L in February 2023 (0.57 mg/L), March 2023 (0.7 mg/L), and April 2023 (0.25 mg/L). This site has commonly presented elevated Nitrate-N levels.
- The concentration of Ammoniacal-N exceeded the ANZECC (95%ile) DGV of 2.1 mg/L in February 2023 (6.37 mg/L), March 2023 (11.7 mg/L), and April 2023 (7.77 mg/L).

Hokio Stream

There were **sixteen exceedances** of consent conditions in samples from the Hokio Stream during the February 2023, March 2023, and April 2023 sampling rounds. The exceedances are as follows:

- $scBOD_5$ exceeded the ANZECC (95%ile) DGV of 2 mg/L at all sites in February 2023 and March 2023, with a consistent value of *3* mg/L – half the detection limit of 6 mg/L.
- Nitrate-N concentrations exceeded the ANZECC (95%ile) DGV and consent trigger value of 0.16 mg/L in February 2023, March 2023, and April 2023 at HS2 and HS3. N-Nitrate exceedances are not unusual at these sites.
- Ammoniacal-N exceeded the ANZECC (95%ile) DGV and consent trigger value of 2.1 mg/L at HS2 (3.67 mg/L) in March 2023.
- Dissolved aluminium exceeded the ANZECC (95%ile) DGV and consent trigger value of 0.055 mg/L in February 2023 at HS1A with a value of 2580 mg/L. This result is significantly concentrated, and is the greatest level recorded across all Hokio Stream sites (by a considerable amount), since monitoring began. The fact that downstream samples were not similarly elevated indicates that this may well be an error.

6 Conclusions

Testing of samples taken in April 2023 was incorrectly done, which required additional sampling to be undertaken. This was completed in June 2023. This report provides comments on all the testing results received from the April and June 2023 sampling rounds.

Monitoring results obtained in the April/June 2023 sampling rounds suggest that the groundwater at the background monitoring sites at the Levin Landfill is being impacted by local ground conditions and/or activities up-gradient of the landfill.

During the April/June 2023 monitoring period there were 32 exceedances of the resource consent conditions: one in the shallow aquifer hydraulically down-gradient of the old landfill, six from the deep aquifer, nine in samples from the Northern Farm drain, and the remaining sixteen from surface water monitoring at locations along the Hokio Stream.

For *E. coli*, the laboratory detection limit was set at either 1 cfu/100mL or 100 cfu/100ml. 100 cfu/100mL was used for most samples, and as stated in previous quarterly reports, is not compatible with the standards defined in the consents.

Methane was detected in eleven of the bores in April 2023, and eight of the bores in June 2023 – including the unlabelled sample. In April 2023, the highest recorded level was 0.12% in bore D6, with the other bores ranging from 0.01 – 0.09%. In June 2023, the highest recorded level was again 0.12% in bore D6, with the other bores ranging from 0.01 – 0.03%. These results are well below the lower explosive limit of 5% and is therefore deemed to represent a 'safe' level.

In April 2023, landfill bore B2 showed the highest carbon dioxide level of 1.48% - a considerable decrease to the previous quarter. This bore has demonstrated such fluctuations historically. However, this result is still relatively higher than all other bores – the next highest being 0.52%. In June 2023, bore C1 presented a significant concentration of 20.2%. This result appears to be very uncharacteristic and should be investigated further. The next greatest concentration of CO_2 for June 2023 was 1.5% at G2s.

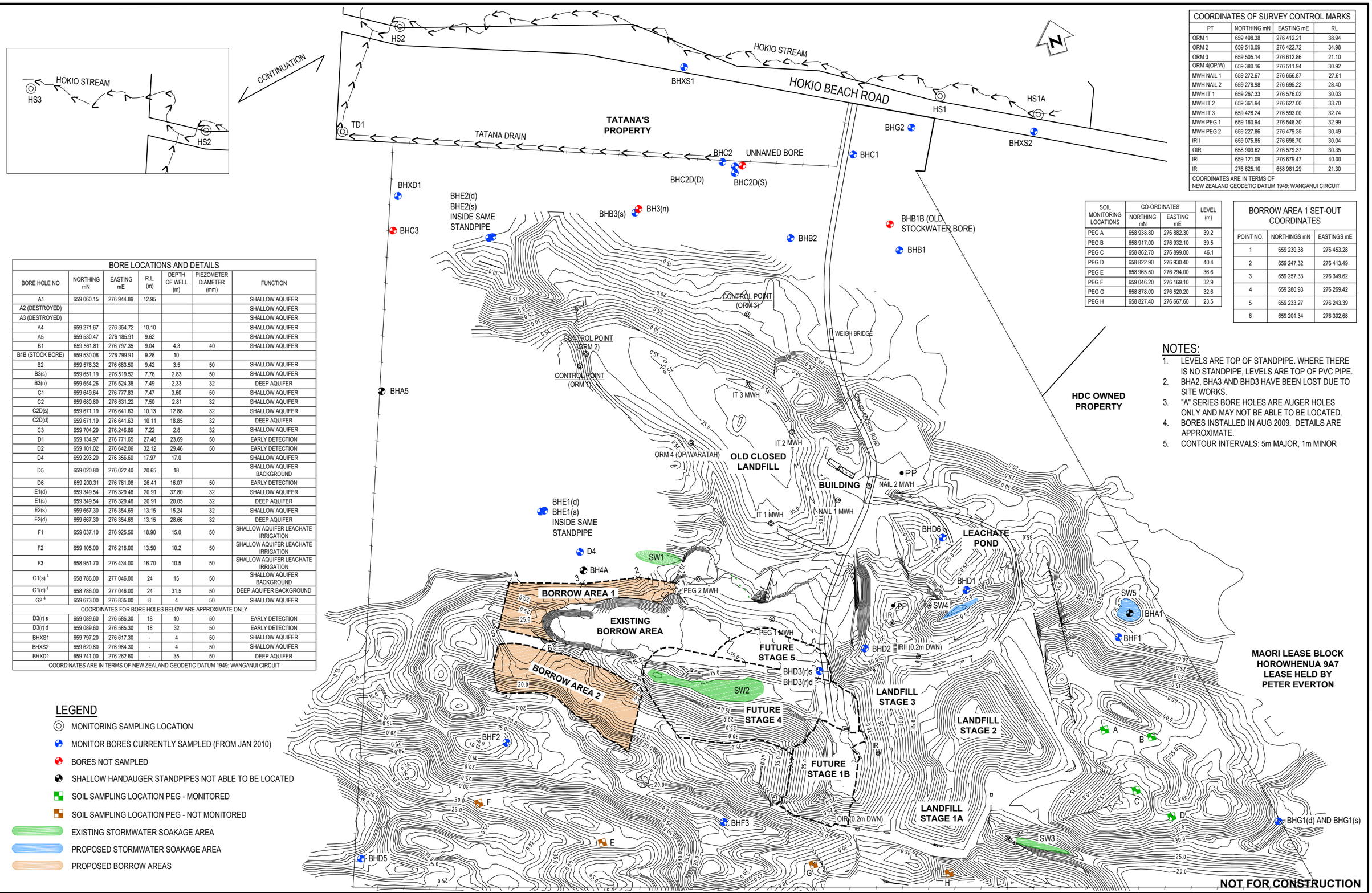
Hydrogen sulphide was detected one bore – G1s (1 ppm) in April 2023, which is around the threshold at which a 'rotten egg' smell (commonly associated with H_2S) can be detected. Hydrogen sulphide was not detected at any sites in June 2023.

The possibility of encountering methane (and possible hydrogen sulphide) in groundwater bores endorses the need for appropriate health and safety measures to be adopted during monitoring, as is the case for the landfill gas extraction wells. No smoking should be permitted when personnel undertake groundwater sampling and when in the vicinity of the groundwater monitoring wells, or in fact anywhere else on the Levin Landfill site. For the safety of site personnel, a personal gas detector should be worn by all workers at the landfill site.

Appendices

We design with community in mind

Appendix A Site Plan



COORDINATES OF SURVEY CONTROL MARKS			
PT	NORTHING mN	EASTING mE	RL
ORM 1	659 498.38	276 412.21	38.94
ORM 2	659 510.09	276 422.72	34.98
ORM 3	659 505.14	276 612.86	21.10
ORM 4(OP/W)	659 380.16	276 511.94	30.92
MWH NAIL 1	659 272.67	276 656.87	27.61
MWH NAIL 2	659 278.98	276 695.22	28.40
MWH IT 1	659 267.33	276 576.02	30.03
MWH IT 2	659 361.94	276 627.00	33.70
MWH IT 3	659 428.24	276 593.00	32.74
MWH PEG 1	659 160.94	276 548.30	32.99
MWH PEG 2	659 227.86	276 479.35	30.49
IRII	659 075.85	276 698.70	30.04
OIR	658 903.62	276 579.37	30.35
IRI	659 121.09	276 679.47	40.00
IR	276 625.10	658 981.29	21.30
COORDINATES ARE IN TERMS OF NEW ZEALAND GEODETIC DATUM 1949: WANGANUI CIRCUIT			

SOIL MONITORING LOCATIONS	CO-ORDINATES		LEVEL (m)
	NORTHING mN	EASTING mE	
PEG A	658 938.80	276 882.30	39.2
PEG B	658 917.00	276 932.10	39.5
PEG C	658 862.70	276 899.00	46.1
PEG D	658 822.90	276 930.40	40.4
PEG E	658 965.50	276 294.00	36.6
PEG F	659 046.20	276 169.10	32.9
PEG G	658 878.00	276 520.20	32.6
PEG H	658 827.40	276 667.60	23.5

BORROW AREA 1 SET-OUT COORDINATES		
POINT NO.	NORTHINGS mN	EASTINGS mE
1	659 230.38	276 453.28
2	659 247.32	276 413.49
3	659 257.33	276 349.62
4	659 280.93	276 269.42
5	659 233.27	276 243.39
6	659 201.34	276 302.68

BORE LOCATIONS AND DETAILS						
BORE HOLE NO	NORTHING mN	EASTING mE	R.L. (m)	DEPTH OF WELL (m)	PIEZOMETER DIAMETER (mm)	FUNCTION
A1	659 060.15	276 944.89	12.95			SHALLOW AQUIFER
A2 (DESTROYED)						SHALLOW AQUIFER
A3 (DESTROYED)						SHALLOW AQUIFER
A4	659 271.67	276 354.72	10.10			SHALLOW AQUIFER
A5	659 530.47	276 185.91	9.62			SHALLOW AQUIFER
B1	659 561.81	276 797.35	9.04	4.3	40	SHALLOW AQUIFER
B1B (STOCK BORE)	659 530.08	276 799.91	9.28	10		
B2	659 576.32	276 683.50	9.42	3.5	50	SHALLOW AQUIFER
B3(s)	659 651.19	276 519.52	7.76	2.83	50	SHALLOW AQUIFER
B3(n)	659 654.26	276 524.38	7.49	2.33	32	DEEP AQUIFER
C1	659 649.64	276 777.83	7.47	3.60	50	SHALLOW AQUIFER
C2	659 680.80	276 631.22	7.50	2.81	32	SHALLOW AQUIFER
C2D(s)	659 671.19	276 641.63	10.13	12.88	32	SHALLOW AQUIFER
C2D(d)	659 671.19	276 641.63	10.11	18.85	32	DEEP AQUIFER
C3	659 704.29	276.246.89	7.22	2.8	32	SHALLOW AQUIFER
D1	659 134.97	276 771.65	27.46	23.69	50	EARLY DETECTION
D2	659 101.02	276 642.06	32.12	29.46	50	EARLY DETECTION
D4	659 293.20	276 356.60	17.97	17.0		SHALLOW AQUIFER
D5	659 020.80	276 022.40	20.65	18		SHALLOW AQUIFER BACKGROUND
D6	659 200.31	276 761.08	26.41	16.07	50	EARLY DETECTION
E1(d)	659 349.54	276 329.48	20.91	37.80	32	SHALLOW AQUIFER
E1(s)	659 349.54	276 329.48	20.91	20.05	32	DEEP AQUIFER
E2(s)	659 667.30	276 354.69	13.15	15.24	32	SHALLOW AQUIFER
E2(d)	659 667.30	276 354.69	13.15	28.66	32	DEEP AQUIFER
F1	659 037.10	276 925.50	18.90	15.0	50	SHALLOW AQUIFER LEACHATE IRRIGATION
F2	659 105.00	276 218.00	13.50	10.2	50	SHALLOW AQUIFER LEACHATE IRRIGATION
F3	658 951.70	276 434.00	16.70	10.5	50	SHALLOW AQUIFER LEACHATE IRRIGATION
G1(s) [4]	658 786.00	277 046.00	24	15	50	SHALLOW AQUIFER BACKGROUND
G1(d) [4]	658 786.00	277 046.00	24	31.5	50	DEEP AQUIFER BACKGROUND
G2 [4]	659 673.00	276 835.00	8	4	50	SHALLOW AQUIFER
COORDINATES FOR BORE HOLES BELOW ARE APPROXIMATE ONLY						
D3(r) s	659 089.60	276 585.30	18	10	50	EARLY DETECTION
D3(r) d	659 089.60	276 585.30	18	32	50	EARLY DETECTION
BHXS1	659 797.20	276 617.30	-	4	50	SHALLOW AQUIFER
BHXS2	659 620.80	276 984.30	-	4	50	SHALLOW AQUIFER
BHXD1	659 741.00	276 262.60	-	35	50	DEEP AQUIFER
COORDINATES ARE IN TERMS OF NEW ZEALAND GEODETIC DATUM 1949: WANGANUI CIRCUIT						

LEGEND

- MONITORING SAMPLING LOCATION
- MONITOR BORES CURRENTLY SAMPLED (FROM JAN 2010)
- BORES NOT SAMPLED
- SHALLOW HANDAUGER STANDPIPES NOT ABLE TO BE LOCATED
- SOIL SAMPLING LOCATION PEG - MONITORED
- SOIL SAMPLING LOCATION PEG - NOT MONITORED
- EXISTING STORMWATER SOAKAGE AREA
- PROPOSED STORMWATER SOAKAGE AREA
- PROPOSED BORROW AREAS

NOTES:

1. LEVELS ARE TOP OF STANDPIPE. WHERE THERE IS NO STANDPIPE, LEVELS ARE TOP OF PVC PIPE.
2. BHA2, BHA3 AND BHD3 HAVE BEEN LOST DUE TO SITE WORKS.
3. "A" SERIES BORE HOLES ARE AUGER HOLES ONLY AND MAY NOT BE ABLE TO BE LOCATED.
4. BORES INSTALLED IN AUG 2009. DETAILS ARE APPROXIMATE.
5. CONTOUR INTERVALS: 5m MAJOR, 1m MINOR

NOT FOR CONSTRUCTION

DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

REV	REVISIONS	DRN	CHK	APP	DATE
E	FOR INFORMATION - BHD3(r)s AND BHD3(r)d ADDED, AND CONTOURS UPDATED FROM JULY 2021 SURVEY	BCJ	PSL	PSL	24.09.21
D	FOR INFORMATION - BORROW AREA 2 RELOCATED, DEFINED AREAS OF FUTURE STAGES 1B, 4 AND 5	BCJ	PSL	PSL	01.06.21
C	FOR INFORMATION - BORROW AREA AND LANDFILL AREA UPDATES AND BORE HOLES AND SAMPLING LOCATIONS ADDED FOR HOKIO STREAM AND TATANA DRAIN	BCJ	PSL	PSL	24.03.21
B	FOR INFORMATION - BORROW AREA AND LANDFILL AREA UPDATES	BCJ	PSL	PSL	22.09.20
A	FOR INFORMATION	BCJ	PSL	PSL	26.08.19

SURVEYED	MWH	
DESIGNED	N/A	-
DRAWN	Brent James	08.2019
CAD REVIEW	Brent James	23.09.21
APPROVED	Phil Landmark	23.09.21
PROF REGISTRATION:		

Stantec

Client:

HOROWHENUA DISTRICT COUNCIL
LEVIN LANDFILL

MONITORING BORES, SOIL SAMPLING LOCATIONS & BORROW AREAS
SITE PLAN, LOCATION AND DETAILS

Status Stamp: FOR INFORMATION ONLY
Date Stamp: 24.09.21
Scales: 1:2000 (A1) 1:4000 (A3)
Drawing No.: 310101088-19-001-G001
Rev.: E

26/08/2019 9:35 a.m.

pw:\\stantec-ap-pw.bentley.com:stantec-ap-pw-01\Documents\New Zealand Clients\Horowhenua District Council\80500724 (310101088) - Levin Landfill Volumes\2019\General\310101088-19-001-G001

Appendix B Sampling Schedule

LEVIN LANDFILL - SUMMARY OF SURFACE AND GROUNDWATER MONITORING REQUIREMENTS (July 2023 - April 2026).

(The testing regime is based on Consent Conditions following the completion of the 2015 Resource Consent Review process).

Reports Due		Sampling Month	Table A (Condition 3, ATH-2002003983.02, formerly DP 6010)						Table B (Condition 3, ATH-2002003983.02, formerly DP 6010)																				Table C (Condition 3, ATH-2002003983.02, formerly DP 6010)					
			Deep Aquifer Bores						Shallow Aquifer Bores																				Irrigation Bores				Hokio Stream[4], [8]				Northern Farm Drain[9]	Leachate Pond[5]
Annual	Quarterly		C2dd	E1d	E2d	G1d	Xd1	D3rd[1]	C1	C2[6]	C2ds[6]	D4	B1	B2	B3s	E1s	E2s	D1[2]	D2[2]	D3rs[1,2]	D6[2]	G1s	G2s	Xs1[6]	Xs2[6]	D5[3]	F1[3]	F2[3]	F3[3]	HS1	HS1A	HS2	HS3	TD1[7]	
Sep-23	**Aug-23**	**Jul-23**	I	I + SW	I	I	C	C	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	C + SW	I	I + SW	I	C	C	I	I	I	I + SW	Monthly Compre.	Monthly Compre.	Monthly Compre.	Monthly Compre.	Monthly Compre.	Monthly Compre.
	Nov-23	**Oct-23**	I	I + SW	I	I	C	C	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	C + SW	I	I + SW	I	C	C	I	I	I	I + SW						
	Feb-24	**Jan-24**	I	I + SW	I	I	C	C	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	C + SW	I	I + SW	I	C	C	I	I	I	I + SW						
	May-24	**Apr-24**	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C	C	C	C	C + A
Sep-24	**Aug-24**	**Jul-24**	I	I + SW	I	I	I	C	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	C + SW	I	I + SW	I	I	I	I	I	I	I + SW		I	I	I	I	I
	Nov-24	**Oct-24**	I	I + SW	I	I	I	C	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	C + SW	I	I + SW	I	I	I	I	I	I	I + SW		C	C	C	C	C
	Feb-25	**Jan-25**	I	I + SW	I	I	I	C	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	C + SW	I	I + SW	I	I	I	I	I	I	I + SW		I	I	I	I	I
	May-25	**Apr-25**	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C	C	C	C	C + A
Sep-25	**Aug-25**	**Jul-25**	I	I + SW	I	I	I	I	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	I + SW	I	I + SW	I	I	I	I	I	I	I + SW		I	I	I	I	I
	Nov-25	**Oct-25**	I	I + SW	I	I	I	I	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	I + SW	I	I + SW	I	I	I	I	I	I	I + SW		C	C	C	C	C
	Feb-26	**Jan-26**	I	I + SW	I	I	I	I	I	I	I	I + SW	I	I	I	I + SW	I + SW	I	I + SW	I + SW	I	I + SW	I	I	I	I	I	I	I + SW		I	I	I	I	I
	May-26	**Apr-26**	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C + A	C	C	C	C	C + A

Sampling at HS1 to be discontinued when HRC advises.

Measure groundwater level and sample all bores for CH_4, CO_2 and O_2 each time that groundwater is sampled (Condition 4a of DP 6011)

Notes:

(1) Replacement bore D3r consists of two nested piezometers that have been called D3rs and D3rd. Testing for comprehensive to continue to provide 2 year's of comprehensive monitoring.
(2) See table below
(3) If irrigation re-commences then the annual sampling is to change from comprehensive + 3 times indicator to bi-annual comprehensive + indicator (Clause D of Condition 3, DP 6010) .
(4) See table below
(5) See table below
(6) Measure water level at C2, C2ds, Xs1 and Xs2 when taking monthly samples at TD1 and within the Hokio Stream. Testing of X-series bores to continue at comprehensive to provide 2 year's of comprehensive data.
(7) Start taking comprehensive samples at TD1 every month when sampling the Hokio Stream sites. Also note the depth of water in the drain invert at TD1. Continue monthly comprehensive sampling to October 2023 to give 24 month's continuous data.
(8) Start measuring approximately the depth of flow in the Hokio Stream at each sampling site when sampling monthly. Monthly sampling at comprehensive level to continue to, and including, October 2023, to give a full continuous 24 months of data.
(9) Northern Farm Drain is a name change from the former 'Tatana Drain'
C Comprehensive list (see below)
I Indicator list (see below)
A Pesticide and SVOC analysis
SW Add sodium and iron analysis (for stormwater consent 102559)

A reduction in sampling frequency at any **groundwater monitoring point** is conditional on (Clauses A - D of Condition 3, DP 6010):

A. Completion of the initial monitoring program;
B. Good consistency of groundwater sample analysis results, or a clearly identified reason for inconsistent results that excludes the contaminant source being landfill operations, stored waste or leachate;
C. No decline in groundwater quality as determined from indicator parameter trends over a period of four consecutive sampling rounds;
D. If a well being monitored on a conditional frequency becomes non-compliant with condition C, the monitoring frequency for that well should return to the initial monitoring frequency until conditions B and C are again being fulfilled.

(2) If site management planning indicates any **early detection monitoring well** is likely to become buried or otherwise destroyed within the following year as a result of normal operations (Clauses E - H, Condition 3, DP 6010):

E. This must be communicated to the regional council;
F. A replacement well is to be constructed in a position agreed upon with Horizons Regional Council
G. The replacement well should be installed in a position suitable to act as a early detection well and be classed as an early detection well;
H. The replacement well should be constructed as a nested well (or two separate wells) with screens positioned in both shallow and deep aquifers.

(4) A reduction in sampling frequency at the **Hokio Stream monitoring locations (HS1A, HS2 and HS3)** is conditional on (Clauses I - L, Condition 3 of DP 6010):

I. No signficant increases in the concentrations between monitoring sites HS1A and HS3, for parameters exceeding the trigger values contained in Table C1 at Site HS3.
J. A statistical analysis approach is to be used to determine if there is a significant increase in contaminant levels between HS1A and HS3.
K. Following the 24 month monitoring period, there shall be no significant increases in concentrations between monitoring sites HS1A and HS3.
L. If the Hokio Stream monitoring locations are being sampled on a conditional frequency and do not meet condition K, the monitoring frequency for all three monitoring locations (HS1A, HS2 and HS3) shall return to the base case intensive monitoring until conditions J and K are again being fulfilled.

(5) A reduction in sampling frequency at the **leachate pond outlet** is conditional on (Clauses M - P, Condition 3, DP 6010):

M. Completion of the initial 2 year monitoring program;
N. Good consistency of water sample analysis results, or a clearly identified reason for inconsistent results;
O. No decline in water quality over a period of four consecutive sampling rounds;
P. If the leachate pond outlet is being sampled on a conditional frequency and becomes non-compliant with condition O, the monitoring frequency should return to the base case intensive monitoring until conditions N and O are again being fulfilled.

COMPREHENSIVE PARAMETER LIST (Table E of Condition 3, DP 6010)

Characterising parameters	pH
	electrical conductivity (EC)
	alkalinity
	total hardness
	suspended solids
Oxygen demand	COD and $scBOD_5$
Nutrients*	NO3-N, NH4-N, DRP and SO_4
Metals*	Al, As, Cd, Cr, Cu, Fe, Mg, Mn, Ni, Pb, Zn and Hg
Other elements	B, Ca, Cl, K and Na
Organics	Total organic carbon, total phenols, volatile acids
Biological	E. coli

* Analyses performed for nutrients and metals are for dissolved rather than total concentrations

INDICATOR PARAMETER LIST (Table F, Condition 3, DP 6010)

Characterising parameters	pH
	electrical conductivity (EC)
Oxygen demand	COD and $scBOD_5$
Nutrients*	NO3-N and NH4-N
Metals*	AL, Mn, Ni, Pb and Hg
Other elements	B and Cl
Biological+	E. coli

* Analyses performed for nutrients and metals are for dissolved rather than total concentrations

+ E. coli added from April 2019 sampling onwards

Appendix C Analytical Results

eurofins | Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017870-01** REPORT DATE **18/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116910
Contract: Landfill

SAMPLE CODE **812-2023-00048857**

Client Reference: 283031-0
Product: Ground water
Sampling Point code: WIL-B1 **Sampling Point name:** Levin B1
Reception Date & Time: 06/04/2023 17:06
Analysis Start Date & Time: 06/04/2023 17:21 **Analysis Ending Date:** 18/04/2023
Sampled Date & Time 05/04/2023 13:00 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	9.08	(± 1.36) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	82.3	(± 8.23) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	90	(± 14) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	399	(± 20.0) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	247	(± 4.9) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.117	(± 0.023) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.075	(± 0.015) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.011	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	2.08	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	0.002	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0176	(± 0.0035) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	707	(± 71) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

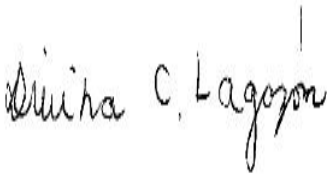
		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0010	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.001	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

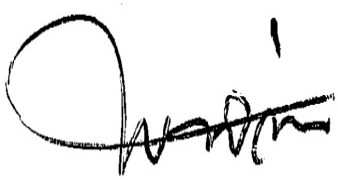
Signature

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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The tests are identified by a five-digit code, their description is available on request.
Accreditation does not apply to comments or graphical representations.
Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-032719-01** REPORT DATE **04/07/2023**

Attention Downer NZ Ltd (EDI Levin)
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NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00127741
Contract: Landfill

SAMPLE CODE **812-2023-00081089**

Client Reference: 299994-0
Product: Ground water
Sampling Point code: WIL-B1 **Sampling Point name:** Levin B1
Reception Date & Time: 15/06/2023 15:57
Analysis Start Date & Time: 15/06/2023 16:08 **Analysis Ending Date:** 04/07/2023
Sampled Date & Time 15/06/2023 05:08 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	6.39	(± 0.96) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<1	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	45	(± 8) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	386	(± 19.3) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	238	(± 4.8) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.007	(± 0.001) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	1.84	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	82.1	(± 8.21) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	0.001	(± 0.0004) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	0.0124	(± 0.0025) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	0.055	(± 0.011) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	59.8	(± 5.98) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	4.80	(± 0.480) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	0.0048	(± 0.0015) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	21.3	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.095	(± 0.019) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	304	(± 30.4) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	0.006	(± 0.0009) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	17.4	(± 0.87) mg/l	0.01
①NW195	**pH**			
	pH	7.7	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	4.77	(± 0.48) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	5	mg/l	3
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0001	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	<0.0001	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	568	(± 57) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	451	(± 45) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	24.3	(± 2.4) mg/l	0.1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0010	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	NotRecovered	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0005	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5
	Iso caproic acid	<5	mg/l	5
	Isobutyric acid	<5	mg/l	5
	Isovaleric acid	<5	mg/l	5
	Propionic acid	<5	mg/l	5
	Valeric acid	<5	mg/l	5
	Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

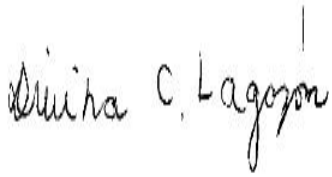
NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW011	**Sulphate:** APHA Online Edition 4110 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Dissolved Boron:** APHA Online Edition 3125 B mod.	NW098	**Dissolved Aluminium:** APHA Online Edition 3125 B mod.
NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.	NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.
NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.	NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.
NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.	NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.
NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.	NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.
NW195	**pH:** APHA Online Edition 4500-H B	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	VQ088	**Phenolics (Total):** APHA 5530
		ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor

Leo Cleave Senior Analyst Senior Analyst

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017873-01** REPORT DATE **18/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116910
Contract: Landfill

SAMPLE CODE **812-2023-00048876**

Client Reference: 283032-0
Product: Ground water
Sampling Point code: WIL-B2 **Sampling Point name:** Levin B2
Reception Date & Time: 06/04/2023 17:18
Analysis Start Date & Time: 06/04/2023 17:21 **Analysis Ending Date:** 18/04/2023
Sampled Date & Time 05/04/2023 13:00 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	79.2	(± 7.92) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.002	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	134	(± 13.4) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	92	(± 15) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	195	(± 9.75) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	250	(± 5.0) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.012	(± 0.003) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.248	(± 0.050) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.007	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	2.36	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0028	(± 0.0006) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	653	(± 65) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

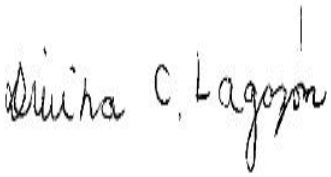
		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0010	mg/l	0.0005
	Chlorobenzene	0.0083	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.001	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Amitesh Kumar Supervisor



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Leo Cleave Senior Analyst Senior Analyst

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
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⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-032717-01** REPORT DATE **04/07/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00127741
Contract: Landfill

SAMPLE CODE **812-2023-00081009**

Client Reference: 301298-0
Product: Ground water
Sampling Point code: WIL-B2 **Sampling Point name:** Levin B2
Reception Date & Time: 15/06/2023 15:10
Analysis Start Date & Time: 15/06/2023 15:11 **Analysis Ending Date:** 04/07/2023
Sampled Date & Time 15/06/2023 07:38 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	102	(± 10.2) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<1	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	105	(± 12) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	194	(± 9.71) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	198	(± 4.0) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.007	(± 0.001) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	2.05	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	117	(± 11.7) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	0.001	(± 0.0004) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	0.0035	(± 0.0007) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	0.306	(± 0.061) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	41.5	(± 4.15) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	3.56	(± 0.356) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	0.0024	(± 0.0007) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	70.9	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.013	(± 0.003) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	104	(± 10.4) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	0.003	(± 0.0007) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	32.1	(± 1.60) mg/l	0.01
①NW195	**pH**			
	pH	7.2	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	17.6	(± 0.88) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	7	mg/l	3
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0001	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	<0.0001	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	553	(± 55) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	463	(± 46) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	29.5	(± 3.0) mg/l	0.1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0010	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	0.0073	mg/l	0.0005
	Chloroethane	NotRecovered	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0005	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5
	Iso caproic acid	<5	mg/l	5
	Isobutyric acid	<5	mg/l	5
	Isovaleric acid	<5	mg/l	5
	Propionic acid	<5	mg/l	5
	Valeric acid	<5	mg/l	5
	Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

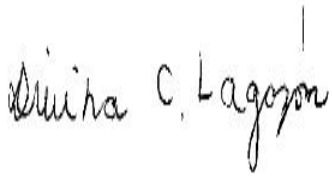
NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW011	**Sulphate:** APHA Online Edition 4110 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Dissolved Boron:** APHA Online Edition 3125 B mod.	NW098	**Dissolved Aluminium:** APHA Online Edition 3125 B mod.
NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.	NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.
NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.	NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.
NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.	NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.
NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.	NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.
NW195	**pH:** APHA Online Edition 4500-H B	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	VQ088	**Phenolics (Total):** APHA 5530
		ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

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Leo Cleave Senior Analyst Senior Analyst

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

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⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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The tests are identified by a five-digit code, their description is available on request.
Accreditation does not apply to comments or graphical representations.
Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
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If the Customer pays for storage of the samples Eurofins will take commercially reasonable steps to store the samples for the agreed period in terms of industry practice.
The Customer acknowledges and accepts that: (a) it is solely responsible for the sampling process and warrants that the sample provided to Eurofins is representative of the lot / batch from which the samples were drawn; and (b) Eurofins expresses no opinion and accepts no liability in respect of the Customer's production process or homogeneity of the sample.
The Eurofins water sampling services uses IANZ approved methodology based on AS/NZS 5667 and / or best practice to collect and transport samples that are fit for the purpose of analytical testing. Eurofins shall have no liability if the sample collected is not representative of the source from which it has been taken. The laboratory is not responsible for sampling activities unless explicitly indicated by the statement "Sampled by Eurofins" on the report for water samples.
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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-032916-01** REPORT DATE **05/07/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes
Contract: Landfill
Order code: EUNZWE-00127741

SAMPLE CODE **812-2023-00081090**

Client Reference: 301299-0
Product: Ground water
Sampling Point code: WIL-B3
Sampling Point name: Levin B3s
Reception Date & Time: 15/06/2023 16:03
Analysis Start Date & Time: 15/06/2023 16:05
Analysis Ending Date: 05/07/2023
Sampled Date & Time 15/06/2023 07:38
Sampler(s) Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	116	(± 11.6) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	2	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	129	(± 14) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	139	(± 6.93) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	251	(± 5.0) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.004	(± 0.001) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	0.016	(± 0.002) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	1.01	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	82.7	(± 8.27) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	0.004	(± 0.0005) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	0.0021	(± 0.0005) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	0.860	(± 0.172) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	68.1	(± 6.81) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	3.57	(± 0.357) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	0.0086	(± 0.0026) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	83.0	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.030	(± 0.006) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	120	(± 12.0) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	<0.002	(± 0.0007) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	0.37	(± 0.09) mg/l	0.01
①NW195	**pH**			
	pH	7.0	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	0.15	(± 0.04) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	84	mg/l	3
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0001	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	<0.0001	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	997	(± 100) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	487	(± 49) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	54.1	(± 5.4) mg/l	0.1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0010	mg/l	0.0005
	Benzene	0.0007	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	0.0012	mg/l	0.0005
	Chloroethane	NotRecovered	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0005	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5
	Iso caproic acid	<5	mg/l	5
	Isobutyric acid	<5	mg/l	5
	Isovaleric acid	<5	mg/l	5
	Propionic acid	<5	mg/l	5
	Valeric acid	<5	mg/l	5
	Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

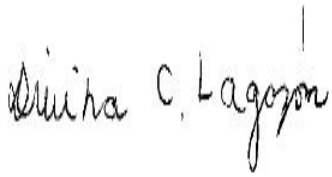
NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW011	**Sulphate:** APHA Online Edition 4110 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Dissolved Boron:** APHA Online Edition 3125 B mod.	NW098	**Dissolved Aluminium:** APHA Online Edition 3125 B mod.
NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.	NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.
NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.	NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.
NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.	NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.
NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.	NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.
NW195	**pH:** APHA Online Edition 4500-H B	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	VQ088	**Phenolics (Total):** APHA 5530
		ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor

Leo Cleave Senior Analyst Senior Analyst

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
The laboratory is not responsible for the information provided by the customer which can affect the validity of the results, for example: sampling information such as date/time, field data etc.
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The Eurofins water sampling services uses IANZ approved methodology based on AS/NZS 5667 and / or best practice to collect and transport samples that are fit for the purpose of analytical testing. Eurofins shall have no liability if the sample collected is not representative of the source from which it has been taken. The laboratory is not responsible for sampling activities unless explicitly indicated by the statement "Sampled by Eurofins" on the report for water samples.
The Customer acknowledges that the Services are provided using the then current state of technology and methods developed and generally applied by Eurofins and involve analysis, interpretations, consulting work and conclusions. Eurofins shall use commercially reasonable degree of care in providing the Services.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017871-01** REPORT DATE **18/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116910
Contract: Landfill

SAMPLE CODE **812-2023-00048868**

Client Reference: 283033-0
Product: Ground water
Sampling Point code: WIL-B3 **Sampling Point name:** Levin B3s
Reception Date & Time: 06/04/2023 17:11
Analysis Start Date & Time: 06/04/2023 17:21 **Analysis Ending Date:** 18/04/2023
Sampled Date & Time 05/04/2023 13:00 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	127	(± 12.7) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.021	(± 0.002) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	69.1	(± 6.91) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	133	(± 14) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	135	(± 6.74) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	244	(± 4.9) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.022	(± 0.005) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.518	(± 0.104) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.006	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.98	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	0.003	(± 0.0005) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0152	(± 0.0030) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	0.003	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	1040	(± 100) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	0.0008	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0010	mg/l	0.0005
	Chlorobenzene	0.0014	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.001	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

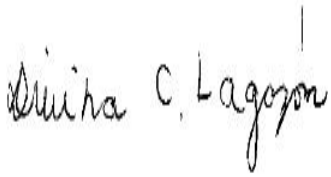
LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

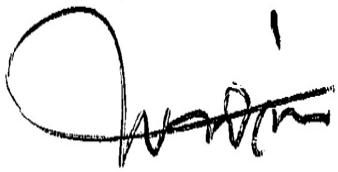
Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017868-01** REPORT DATE **18/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116910
Contract: Landfill

SAMPLE CODE **812-2023-00048820**

Client Reference: 283027-0
Product: Ground water
Sampling Point code: WIL-C1 **Sampling Point name:** Levin C1
Reception Date & Time: 06/04/2023 16:23
Analysis Start Date & Time: 06/04/2023 16:30 **Analysis Ending Date:** 18/04/2023
Sampled Date & Time 05/04/2023 09:02 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS (UNCERTAINTY)		LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	11.4	(± 1.14) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	44.6	(± 4.46) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	73	(± 12) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	155	(± 7.75) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	119	(± 2.4) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.009	(± 0.002) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.565	(± 0.113) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.028	(± 0.003) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.99	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0046	(± 0.0009) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	353	(± 35) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0010	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.001	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

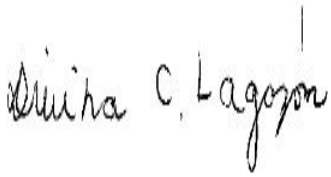
LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

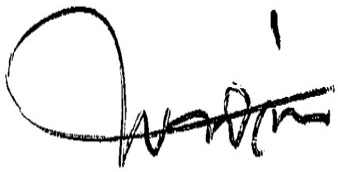
Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE	AR-23-NW-032720-01	REPORT DATE	04/07/2023

Attention Downer NZ Ltd (EDI Levin)
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Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes
Contract: Landfill
Order code: EUNZWE-00127741

SAMPLE CODE 812-2023-00081091

Client Reference: 301300-0
Product: Ground water
Sampling Point code: WIL-C1
Sampling Point name: Levin C1
Reception Date & Time: 15/06/2023 16:04
Analysis Start Date & Time: 15/06/2023 16:08
Analysis Ending Date: 04/07/2023
Sampled Date & Time 15/06/2023 05:08
Sampler(s) Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	11.6	(± 1.16) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	85	(± 14) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	147	(± 7.35) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	119	(± 2.4) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.020	(± 0.002) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	1.02	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	44.3	(± 4.43) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	0.0028	(± 0.0006) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	0.408	(± 0.082) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	29.7	(± 2.97) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	0.307	(± 0.0307) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	0.0010	(± 0.0004) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	25.8	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.010	(± 0.003) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	120	(± 12.0) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	<0.002	(± 0.0007) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	<0.01	(± 0.003) mg/l	0.01
①NW195	**pH**			
	pH	7.0	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	22.1	(± 1.11) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	517	mg/l	3
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0001	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	<0.0001	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	352	(± 35) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	233	(± 23) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	23.6	(± 2.4) mg/l	0.1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0010	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012

		RESULTS	(UNCERTAINTY)	LOQ
NW229	**VOC (GC-MS)**			
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	NotRecovered	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0005	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5
	Iso caproic acid	<5	mg/l	5
	Isobutyric acid	<5	mg/l	5
	Isovaleric acid	<5	mg/l	5
	Propionic acid	<5	mg/l	5
	Valeric acid	<5	mg/l	5
	Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

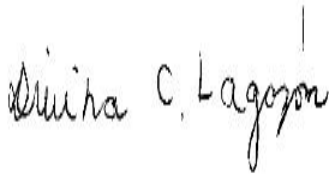
NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW011	**Sulphate:** APHA Online Edition 4110 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Dissolved Boron:** APHA Online Edition 3125 B mod.	NW098	**Dissolved Aluminium:** APHA Online Edition 3125 B mod.
NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.	NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.
NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.	NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.
NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.	NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.
NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.	NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.
NW195	**pH:** APHA Online Edition 4500-H B	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	VQ088	**Phenolics (Total):** APHA 5530
		ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor

Leo Cleave Senior Analyst Senior Analyst

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
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⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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If the Customer pays for storage of the samples Eurofins will take commercially reasonable steps to store the samples for the agreed period in terms of industry practice.
The Customer acknowledges and accepts that: (a) it is solely responsible for the sampling process and warrants that the sample provided to Eurofins is representative of the lot / batch from which the samples were drawn; and (b) Eurofins expresses no opinion and accepts no liability in respect of the Customer's production process or homogeneity of the sample.
The Eurofins water sampling services uses IANZ approved methodology based on AS/NZS 5667 and / or best practice to collect and transport samples that are fit for the purpose of analytical testing. Eurofins shall have no liability if the sample collected is not representative of the source from which it has been taken. The laboratory is not responsible for sampling activities unless explicitly indicated by the statement "Sampled by Eurofins" on the report for water samples.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017869-01** REPORT DATE **18/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116910
Contract: Landfill

SAMPLE CODE **812-2023-00048855**

Client Reference: 283028-0
Product: Ground water
Sampling Point code: WIL-C2 **Sampling Point name:** Levin C2
Reception Date & Time: 06/04/2023 17:06
Analysis Start Date & Time: 06/04/2023 17:21 **Analysis Ending Date:** 18/04/2023
Sampled Date & Time 05/04/2023 12:59 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	166	(± 16.6) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.002	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	58.2	(± 5.82) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	133	(± 14) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	171	(± 8.53) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	279	(± 5.6) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.011	(± 0.003) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	6000	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.901	(± 0.180) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.018	(± 0.002) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	1.63	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	0.002	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0006	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	0.005	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	1140	(± 110) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0010	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.001	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor

Leo Cleave Senior Analyst Senior Analyst

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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-032917-01** REPORT DATE **05/07/2023**

Attention Downer NZ Ltd (EDI Levin)
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Contact for your orders: Gabriela Carvalhaes
Contract: Landfill

Order code: EUNZWE-00127741

SAMPLE CODE **812-2023-00081085**

Client Reference: 301301-0
Product: Ground water
Sampling Point code: WIL-C2
Sampling Point name: Levin C2
Reception Date & Time: 15/06/2023 15:52
Analysis Start Date & Time: 15/06/2023 16:08
Analysis Ending Date: 05/07/2023
Sampled Date & Time 13/06/2023 13:05
Sampler(s) Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	171	(± 17.1) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	2	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	107	(± 12) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	151	(± 7.53) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	251	(± 5.0) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.011	(± 0.001) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	1.54	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	48.7	(± 4.87) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	0.002	(± 0.0004) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	0.0019	(± 0.0004) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	0.636	(± 0.127) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	28.7	(± 2.87) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	0.187	(± 0.0187) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	0.0039	(± 0.0012) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	70.8	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.018	(± 0.004) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	128	(± 12.8) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	0.009	(± 0.001) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	<0.10	(± 0.02) mg/l	0.01
①NW195	**pH**			
	pH	7.2	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	0.39	(± 0.10) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	84	mg/l	3
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0001	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	<0.0001	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	669	(± 67) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	240	(± 24) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	41.2	(± 4.1) mg/l	0.1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0010	mg/l	0.0005
	Benzene	0.0007	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	NotRecovered	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0005	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5
	Iso caproic acid	<5	mg/l	5
	Isobutyric acid	<5	mg/l	5
	Isovaleric acid	<5	mg/l	5
	Propionic acid	<5	mg/l	5
	Valeric acid	<5	mg/l	5
	Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

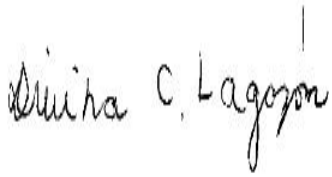
NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW011	**Sulphate:** APHA Online Edition 4110 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Dissolved Boron:** APHA Online Edition 3125 B mod.	NW098	**Dissolved Aluminium:** APHA Online Edition 3125 B mod.
NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.	NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.
NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.	NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.
NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.	NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.
NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.	NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.
NW195	**pH:** APHA Online Edition 4500-H B	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	VQ088	**Phenolics (Total):** APHA 5530
		ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor

Leo Cleave Senior Analyst Senior Analyst

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017525-01** REPORT DATE **17/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116448
Contract: Landfill

SAMPLE CODE **812-2023-00046686**

Client Reference: 283022-0
Product: Ground water
Sampling Point code: WIL-C2dd **Sampling Point name:** Levin C2dd
Reception Date & Time: 05/04/2023 11:50
Analysis Start Date & Time: 05/04/2023 11:58 **Analysis Ending Date:** 17/04/2023
Sampler(s) Customer **Sampled by Eurofins** No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.34	(± 0.10) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.004	(± 0.0005) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	46.6	(± 4.66) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	<15	(± 5) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	40.3	(± 2.01) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	55.3	(± 1.1) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.667	(± 0.133) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.013	(± 0.003) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	<0.002	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.08	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002

		RESULTS	(UNCERTAINTY)	LOQ
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	217	(± 22) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

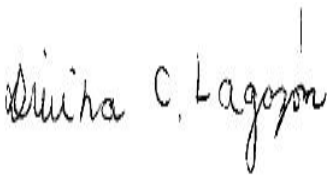
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.	NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.	NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.	NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

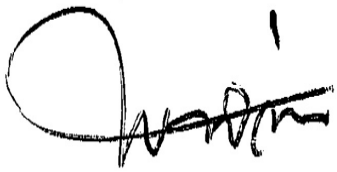
Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

EXPLANATORY NOTE

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⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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END OF REPORT

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Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017872-01** REPORT DATE **18/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

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Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116910
Contract: Landfill

SAMPLE CODE **812-2023-00048875**

Client Reference: 283029-0
Product: Ground water
Sampling Point code: WIL-C2ds **Sampling Point name:** Levin C2ds
Reception Date & Time: 06/04/2023 17:17
Analysis Start Date & Time: 06/04/2023 17:21 **Analysis Ending Date:** 18/04/2023
Sampled Date & Time 05/04/2023 12:59 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	1.37	(± 0.21) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	101	(± 10.1) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	65	(± 11) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	85.9	(± 4.30) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	115	(± 2.3) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.015	(± 0.003) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	2.14	(± 0.214) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.004	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.76	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	0.003	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	497	(± 50) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0010	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.001	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
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	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

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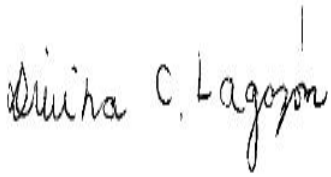
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

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Leo Cleave Senior Analyst Senior Analyst

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The Customer acknowledges that the Services are provided using the then current state of technology and methods developed and generally applied by Eurofins and involve analysis, interpretations, consulting work and conclusions. Eurofins shall use commercially reasonable degree of care in providing the Services.
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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE	AR-23-NW-032723-01	REPORT DATE	04/07/2023

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Contact for your orders: Gabriela Carvalhaes
Contract: Landfill
Order code: EUNZWE-00127741

SAMPLE CODE 812-2023-00081084

Client Reference: 301303-0
Product: Ground water
Sampling Point code: WIL-C2ds
Sampling Point name: Levin C2ds
Reception Date & Time: 15/06/2023 15:49
Analysis Start Date & Time: 15/06/2023 16:08
Analysis Ending Date: 04/07/2023
Sampled Date & Time 13/06/2023 13:06
Sampler(s) Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	76.6	(± 7.66) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	6	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	78	(± 13) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	97.1	(± 4.85) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	158	(± 3.2) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.004	(± 0.001) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	0.89	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	59.2	(± 5.92) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	0.001	(± 0.0004) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	0.0009	(± 0.0003) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	0.415	(± 0.083) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	24.9	(± 2.49) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	0.785	(± 0.0785) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	0.0025	(± 0.0008) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	33.1	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.017	(± 0.004) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	92.5	(± 9.25) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	0.007	(± 0.0009) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	<0.10	(± 0.02) mg/l	0.01
①**NW195**	**pH**			
	pH	7.2	(± 0.2)	0.1
③**VQ088**	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	0.16	(± 0.04) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	116	mg/l	3
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0001	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	<0.0001	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	635	(± 63) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	251	(± 25) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	26.8	(± 2.7) mg/l	0.1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0010	mg/l	0.0005
	Benzene	0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	NotRecovered	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0005	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5
	Iso caproic acid	<5	mg/l	5
	Isobutyric acid	<5	mg/l	5
	Isovaleric acid	<5	mg/l	5
	Propionic acid	<5	mg/l	5
	Valeric acid	<5	mg/l	5
	Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

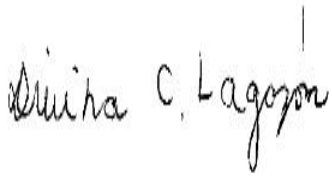
NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW011	**Sulphate:** APHA Online Edition 4110 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Dissolved Boron:** APHA Online Edition 3125 B mod.	NW098	**Dissolved Aluminium:** APHA Online Edition 3125 B mod.
NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.	NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.
NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.	NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.
NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.	NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.
NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.	NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.
NW195	**pH:** APHA Online Edition 4500-H B	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	VQ088	**Phenolics (Total):** APHA 5530
		ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor

Leo Cleave Senior Analyst Senior Analyst

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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The tests are identified by a five-digit code, their description is available on request.
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Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017336-01** REPORT DATE **15/04/2023**

Attention Downer NZ Ltd (EDI Levin)
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NEW ZEALAND

Phone (06) 367 2705
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Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116315
Contract: Landfill

SAMPLE CODE **812-2023-00046274**

Client Reference: 283036-0
Product: Ground water
Sampling Point code: WIL-D1 **Sampling Point name:** Levin D1
Reception Date & Time: 04/04/2023 16:35
Analysis Start Date & Time: 04/04/2023 17:10 **Analysis Ending Date:** 15/04/2023
Sampled Date & Time 03/04/2023 12:55 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	<0.01	(± 0.003) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<1	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	16.4	(± 1.64) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	<15	(± 5) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	14.3	(± 0.72) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	33.6	(± 0.7) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.095	(± 0.019) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	<0.005	(± 0.002) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	<0.002	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.05	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	89	(± 9) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

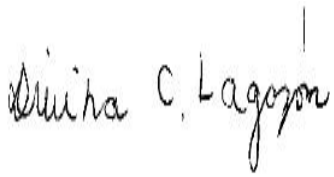
NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

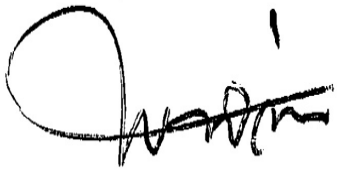
Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

END OF REPORT

eurofins | Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017339-01** REPORT DATE **15/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116315
Contract: Landfill

SAMPLE CODE **812-2023-00046280**

Client Reference: 283037-0
Product: Ground water
Sampling Point code: WIL-D2 **Sampling Point name:** Levin D2
Reception Date & Time: 04/04/2023 16:41
Analysis Start Date & Time: 04/04/2023 17:10 **Analysis Ending Date:** 15/04/2023
Sampled Date & Time 03/04/2023 12:56 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.65	(± 0.19) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	<0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<1	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	22.8	(± 2.28) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	42	(± 8) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	50.7	(± 2.53) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	48.2	(± 1.0) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.027	(± 0.006) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	5.01	(± 0.501) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.009	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.06	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	147	(± 15) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
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NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
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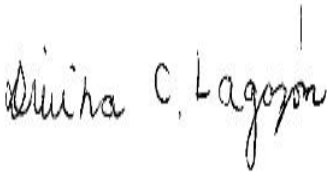
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

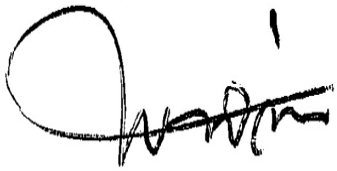
Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

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Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
This document can only be reproduced in full.
The tests are identified by a five-digit code, their description is available on request.
Accreditation does not apply to comments or graphical representations.
Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
The laboratory is not responsible for the information provided by the customer which can affect the validity of the results, for example: sampling information such as date/time, field data etc.
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The Customer acknowledges and accepts that: (a) it is solely responsible for the sampling process and warrants that the sample provided to Eurofins is representative of the lot / batch from which the samples were drawn; and (b) Eurofins expresses no opinion and accepts no liability in respect of the Customer's production process or homogeneity of the sample.
The Eurofins water sampling services uses IANZ approved methodology based on AS/NZS 5667 and / or best practice to collect and transport samples that are fit for the purpose of analytical testing. Eurofins shall have no liability if the sample collected is not representative of the source from which it has been taken. The laboratory is not responsible for sampling activities unless explicitly indicated by the statement "Sampled by Eurofins" on the report for water samples.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017338-01** REPORT DATE **15/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116315
Contract: Landfill

SAMPLE CODE **812-2023-00046276**

Client Reference: 283105-0
Product: Ground water
Sampling Point code: WIL-D3rd **Sampling Point name:** Levin D3rd
Reception Date & Time: 04/04/2023 16:39
Analysis Start Date & Time: 04/04/2023 17:10 **Analysis Ending Date:** 15/04/2023
Sampler(s) Customer **Sampled by Eurofins** No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.38	(± 0.11) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.020	(± 0.002) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<1	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	64.5	(± 6.45) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	23	(± 6) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	31.0	(± 1.55) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	51.8	(± 1.0) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	1.24	(± 0.124) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.035	(± 0.007) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.004	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.05	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002

		RESULTS	(UNCERTAINTY)	LOQ
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	209	(± 21) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.	NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.	NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.	NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017337-01** REPORT DATE **15/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
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NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116315
Contract: Landfill

SAMPLE CODE **812-2023-00046275**

Client Reference: 283106-0
Product: Ground water
Sampling Point code: WIL-D3rs **Sampling Point name:** Levin D3rs
Reception Date & Time: 04/04/2023 16:37
Analysis Start Date & Time: 04/04/2023 17:10 **Analysis Ending Date:** 15/04/2023
Sampled Date & Time 03/04/2023 12:58 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.67	(± 0.20) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<1	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	11.2	(± 1.12) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	67	(± 11) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	16.5	(± 0.83) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	20.1	(± 0.4) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.065	(± 0.013) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	17.2	(± 1.72) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.088	(± 0.009) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.04	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	0.004	(± 0.0005) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	64	(± 6) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor

Leo Cleave Senior Analyst Senior Analyst

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-032714-01** REPORT DATE **04/07/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
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NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00127552
Contract: Landfill

SAMPLE CODE **812-2023-00080223**

Client Reference: 301309-0
Product: Ground water
Sampling Point code: WIL-D3rs **Sampling Point name:** Levin D3rs
Reception Date & Time: 14/06/2023 15:42
Analysis Start Date & Time: 14/06/2023 15:49 **Analysis Ending Date:** 04/07/2023
Sampled Date & Time 13/06/2023 00:00 **Sampler(s)** Customer
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.67	(± 0.20) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<1	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	63	(± 11) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	16.3	(± 0.82) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	19.7	(± 0.4) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.066	(± 0.007) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	<0.03	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	10.6	(± 1.06) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	0.004	(± 0.0005) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	0.0008	(± 0.0002) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	11.4	(± 1.14) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	4.87	(± 0.49) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	0.346	(± 0.0346) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	<0.0005	(± 0.0002) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	3.69	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.096	(± 0.019) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	21.4	(± 2.14) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	0.003	(± 0.0007) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	<0.01	(± 0.003) mg/l	0.01
①NW195	**pH**			
	pH	6.5	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	2.10	(± 0.21) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	<6	mg/l	3
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0001	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	<0.0001	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	65	(± 7) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	47	(± 5) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	23.3	(± 2.3) mg/l	0.1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0010	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	NotRecovered	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0005	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	0.0006	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5
	Iso caproic acid	<5	mg/l	5
	Isobutyric acid	<5	mg/l	5
	Isovaleric acid	<5	mg/l	5
	Propionic acid	<5	mg/l	5
	Valeric acid	<5	mg/l	5
	Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

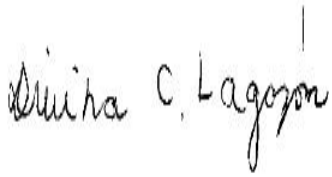
NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW011	**Sulphate:** APHA Online Edition 4110 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Dissolved Boron:** APHA Online Edition 3125 B mod.	NW098	**Dissolved Aluminium:** APHA Online Edition 3125 B mod.
NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.	NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.
NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.	NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.
NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.	NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.
NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.	NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.
NW195	**pH:** APHA Online Edition 4500-H B	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	VQ088	**Phenolics (Total):** APHA 5530
		ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

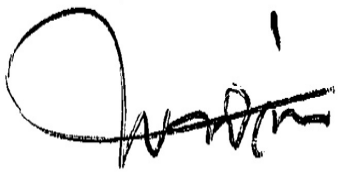
Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

EXPLANATORY NOTE

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②Test is subcontracted within Eurofins group and is accredited
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LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017864-01** REPORT DATE **18/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116910
Contract: Landfill

SAMPLE CODE **812-2023-00048797**

Client Reference: 283030-0
Product: Ground water
Sampling Point code: WIL-D4 **Sampling Point name:** Levin D4
Reception Date & Time: 06/04/2023 16:14
Analysis Start Date & Time: 06/04/2023 16:30 **Analysis Ending Date:** 18/04/2023
Sampled Date & Time 05/04/2023 09:01 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.23	(± 0.07) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.003	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	11.4	(± 1.14) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	20	(± 6) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	31.4	(± 1.57) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	28.3	(± 0.6) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.023	(± 0.005) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.866	(± 0.173) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.005	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.20	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	85	(± 8) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

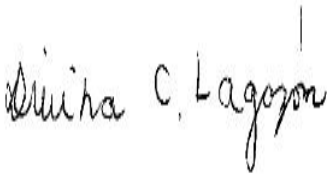
		RESULTS	(UNCERTAINTY)	LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0010	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.001	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

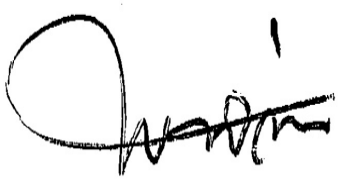
Signature

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

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N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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The Eurofins water sampling services uses IANZ approved methodology based on AS/NZS 5667 and / or best practice to collect and transport samples that are fit for the purpose of analytical testing. Eurofins shall have no liability if the sample collected is not representative of the source from which it has been taken. The laboratory is not responsible for sampling activities unless explicitly indicated by the statement "Sampled by Eurofins" on the report for water samples.
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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-032718-01** REPORT DATE **04/07/2023**

Attention Downer NZ Ltd (EDI Levin)
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P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00127741
Contract: Landfill

SAMPLE CODE **812-2023-00081083**

Client Reference: 301308-0
Product: Ground water
Sampling Point code: WIL-D4 **Sampling Point name:** Levin D4
Reception Date & Time: 15/06/2023 15:46
Analysis Start Date & Time: 15/06/2023 16:08 **Analysis Ending Date:** 04/07/2023
Sampled Date & Time 15/06/2023 05:08 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.23	(± 0.07) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<1	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	<15	(± 5) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	31.4	(± 1.57) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	27.5	(± 0.6) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.003	(± 0.001) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	0.003	(± 0.0004) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	0.11	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	10.4	(± 1.04) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	1.26	(± 0.126) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	7.17	(± 0.72) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	0.188	(± 0.0188) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	0.0082	(± 0.0025) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	5.62	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.029	(± 0.006) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	32.2	(± 3.22) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	0.003	(± 0.0007) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	<0.01	(± 0.003) mg/l	0.01
①**NW195**	**pH**			
	pH	7.1	(± 0.2)	0.1
③**VQ088**	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	5.01	(± 0.50) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	<5	mg/l	3
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0001	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	<0.0001	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	85	(± 9) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	56	(± 6) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	3.7	(± 0.4) mg/l	0.1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0010	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	NotRecovered	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0005	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5
	Iso caproic acid	<5	mg/l	5
	Isobutyric acid	<5	mg/l	5
	Isovaleric acid	<5	mg/l	5
	Propionic acid	<5	mg/l	5
	Valeric acid	<5	mg/l	5
	Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

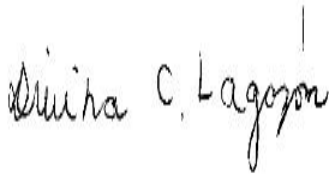
NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW011	**Sulphate:** APHA Online Edition 4110 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Dissolved Boron:** APHA Online Edition 3125 B mod.	NW098	**Dissolved Aluminium:** APHA Online Edition 3125 B mod.
NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.	NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.
NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.	NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.
NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.	NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.
NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.	NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.
NW195	**pH:** APHA Online Edition 4500-H B	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	VQ088	**Phenolics (Total):** APHA 5530
		ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor

Leo Cleave Senior Analyst Senior Analyst

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017531-01** REPORT DATE **17/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116448
Contract: Landfill

SAMPLE CODE **812-2023-00047475**

Client Reference: 283042-0
Product: Ground water
Sampling Point code: WIL-D5 **Sampling Point name:** Levin D5
Reception Date & Time: 05/04/2023 16:19
Analysis Start Date & Time: 05/04/2023 16:33 **Analysis Ending Date:** 17/04/2023
Sampled Date & Time 04/04/2023 10:46 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.01	(± 0.005) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	<0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	12.8	(± 1.28) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	<15	(± 5) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	30.8	(± 1.54) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	31.8	(± 0.6) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.072	(± 0.015) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.117	(± 0.023) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.002	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.04	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	84	(± 8) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

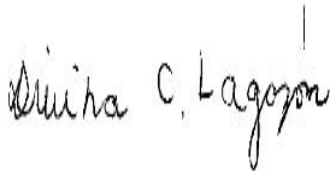
NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

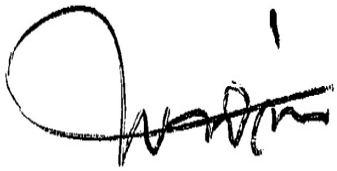
Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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The tests are identified by a five-digit code, their description is available on request.
Accreditation does not apply to comments or graphical representations.
Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017534-01** REPORT DATE **17/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116448
Contract: Landfill

SAMPLE CODE **812-2023-00047486**

Client Reference: 283039-0
Product: Ground water
Sampling Point code: WIL-D6 **Sampling Point name:** Levin D6
Reception Date & Time: 05/04/2023 16:28
Analysis Start Date & Time: 05/04/2023 16:33 **Analysis Ending Date:** 17/04/2023
Sampled Date & Time 04/04/2023 10:44 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	<0.01	(± 0.004) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	19.0	(± 1.90) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	<15	(± 5) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	16.9	(± 0.85) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	37.7	(± 0.8) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.106	(± 0.021) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	<0.005	(± 0.002) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.003	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.06	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0020	(± 0.0004) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	113	(± 11) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
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	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
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	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

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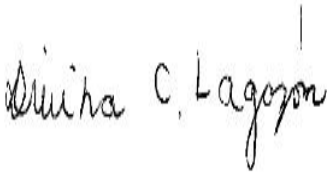
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

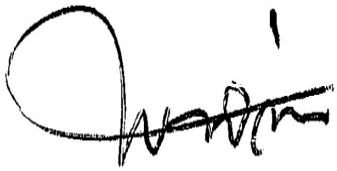
Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

EXPLANATORY NOTE

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②Test is subcontracted within Eurofins group and is accredited
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Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-032715-01** REPORT DATE **04/07/2023**

Attention Downer NZ Ltd (EDI Levin)
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Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes
Contract: Landfill
Order code: EUNZWE-00127552

SAMPLE CODE **812-2023-00080234**

Client Reference: 301310-0
Product: Ground water
Sampling Point code: WIL-D6
Sampling Point name: Levin D6
Reception Date & Time: 14/06/2023 15:46
Analysis Start Date & Time: 14/06/2023 15:49
Analysis Ending Date: 04/07/2023
Sampled Date & Time 13/06/2023 00:00
Sampler(s) Customer
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	<0.01	(± 0.003) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<1	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	<15	(± 5) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	22.0	(± 1.10) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	42.8	(± 0.9) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	<0.002	(± 0.001) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	0.04	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	21.8	(± 2.18) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	0.0006	(± 0.0002) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	<0.005	(± 0.002) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	16.6	(± 1.66) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	0.0010	(± 0.0003) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	<0.0005	(± 0.0002) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	7.95	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.101	(± 0.020) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	34.4	(± 3.44) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	<0.002	(± 0.0007) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	12.4	(± 0.62) mg/l	0.01
①NW195	**pH**			
	pH	6.8	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	6.50	(± 0.65) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	<5	mg/l	3
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0001	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	<0.0001	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	123	(± 12) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	123	(± 12) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	1.0	(± 0.1) mg/l	0.1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0010	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	NotRecovered	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0005	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5
	Iso caproic acid	<5	mg/l	5
	Isobutyric acid	<5	mg/l	5
	Isovaleric acid	<5	mg/l	5
	Propionic acid	<5	mg/l	5
	Valeric acid	<5	mg/l	5
	Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

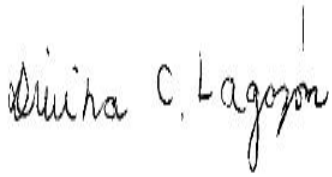
NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW011	**Sulphate:** APHA Online Edition 4110 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Dissolved Boron:** APHA Online Edition 3125 B mod.	NW098	**Dissolved Aluminium:** APHA Online Edition 3125 B mod.
NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.	NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.
NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.	NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.
NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.	NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.
NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.	NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.
NW195	**pH:** APHA Online Edition 4500-H B	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	VQ088	**Phenolics (Total):** APHA 5530
		ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

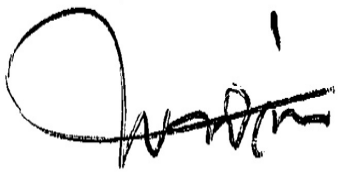
Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



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Ganesh Ilancko Supervisor

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017866-01** REPORT DATE **18/04/2023**

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NEW ZEALAND

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Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116910
Contract: Landfill

SAMPLE CODE **812-2023-00048803**

Client Reference: 283023-0
Product: Ground water
Sampling Point code: WIL-E1d **Sampling Point name:** Levin E1d
Reception Date & Time: 06/04/2023 16:16
Analysis Start Date & Time: 06/04/2023 16:30 **Analysis Ending Date:** 18/04/2023
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.20	(± 0.06) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.006	(± 0.0007) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	33.6	(± 3.36) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	18	(± 6) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	38.2	(± 1.91) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	45.0	(± 0.9) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.390	(± 0.078) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.034	(± 0.007) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.004	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.15	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002

		RESULTS	(UNCERTAINTY)	LOQ
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	170	(± 17) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0010	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.001	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

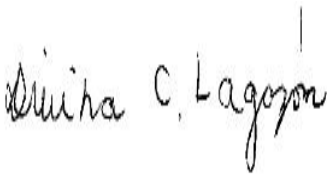
NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.	NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.	NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.	NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

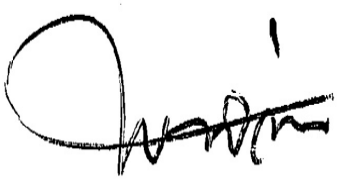
Signature

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
This document can only be reproduced in full.
The tests are identified by a five-digit code, their description is available on request.
Accreditation does not apply to comments or graphical representations.
Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
The laboratory is not responsible for the information provided by the customer which can affect the validity of the results, for example: sampling information such as date/time, field data etc.
This report issued by Eurofins relates exclusively to the samples provided by the Customer and does not relate to the lot / batch from which the samples have been obtained.
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All samples become the property of Eurofins to the extent necessary for the performance of the Services.
Eurofins will not be required to store samples and may destroy or otherwise dispose of the samples or return the samples to the Customer (at the Customer's cost in all respects) immediately following analysis of the samples.
If the Customer pays for storage of the samples Eurofins will take commercially reasonable steps to store the samples for the agreed period in terms of industry practice.
The Customer acknowledges and accepts that: (a) it is solely responsible for the sampling process and warrants that the sample provided to Eurofins is representative of the lot / batch from which the samples were drawn; and (b) Eurofins expresses no opinion and accepts no liability in respect of the Customer's production process or homogeneity of the sample.
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The Customer acknowledges that the Services are provided using the then current state of technology and methods developed and generally applied by Eurofins and involve analysis, interpretations, consulting work and conclusions. Eurofins shall use commercially reasonable degree of care in providing the Services.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017867-01** REPORT DATE **18/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116910
Contract: Landfill

SAMPLE CODE **812-2023-00048807**

Client Reference: 283034-0
Product: Ground water
Sampling Point code: WIL-E1s **Sampling Point name:** Levin E1s
Reception Date & Time: 06/04/2023 16:16
Analysis Start Date & Time: 06/04/2023 16:30 **Analysis Ending Date:** 18/04/2023
Sampled Date & Time 05/04/2023 09:01 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.21	(± 0.06) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.002	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	11.6	(± 1.16) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	16	(± 6) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	26.4	(± 1.32) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	25.9	(± 0.5) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.048	(± 0.010) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	5.14	(± 0.514) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.012	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.10	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	87	(± 9) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

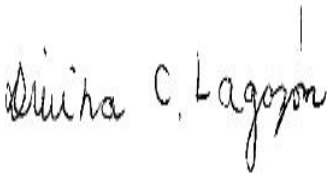
		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0010	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.001	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

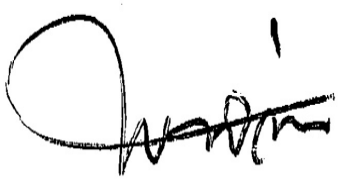
Signature

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

EXPLANATORY NOTE

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⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017526-01** REPORT DATE **17/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116448
Contract: Landfill

SAMPLE CODE **812-2023-00046689**

Client Reference: 283024-0
Product: Ground water
Sampling Point code: WIL-E2d **Sampling Point name:** Levin E2d
Reception Date & Time: 05/04/2023 11:54
Analysis Start Date & Time: 05/04/2023 11:58 **Analysis Ending Date:** 17/04/2023
Sampler(s) Customer **Sampled by Eurofins** No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.27	(± 0.08) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	26.1	(± 2.61) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	<15	(± 5) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	40.7	(± 2.03) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	44.5	(± 0.9) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.612	(± 0.122) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.065	(± 0.013) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.002	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.07	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002

		RESULTS	(UNCERTAINTY)	LOQ
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	158	(± 16) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

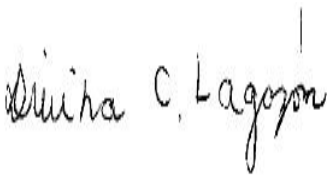
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.	NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.	NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.	NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

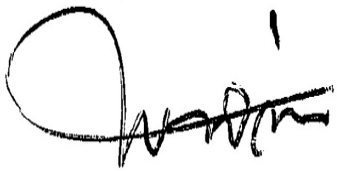
Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

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⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017865-01** REPORT DATE **18/04/2023**

Attention Downer NZ Ltd (EDI Levin)
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4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116910
Contract: Landfill

SAMPLE CODE **812-2023-00048798**

Client Reference: 283035-0
Product: Ground water
Sampling Point code: WIL-E2s **Sampling Point name:** Levin E2s
Reception Date & Time: 06/04/2023 16:14
Analysis Start Date & Time: 06/04/2023 16:30 **Analysis Ending Date:** 18/04/2023
Sampled Date & Time 05/04/2023 09:01 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.08	(± 0.02) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.003	(± 0.0005) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	24.7	(± 2.47) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	30	(± 7) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	38.9	(± 1.95) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	33.8	(± 0.7) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.290	(± 0.058) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.504	(± 0.101) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.021	(± 0.002) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.16	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0174	(± 0.0035) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	90	(± 9) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

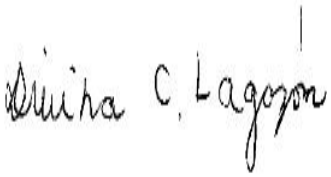
		RESULTS	(UNCERTAINTY)	LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0010	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.001	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

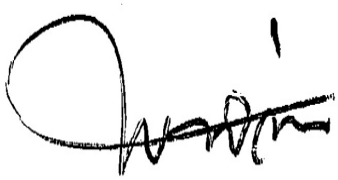
Signature

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017527-01** REPORT DATE **17/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116448
Contract: Landfill

SAMPLE CODE **812-2023-00047466**

Client Reference: 283043-0
Product: Ground water
Sampling Point code: WIL-F1 **Sampling Point name:** Levin F1
Reception Date & Time: 05/04/2023 16:10
Analysis Start Date & Time: 05/04/2023 16:33 **Analysis Ending Date:** 17/04/2023
Sampled Date & Time 04/04/2023 10:45 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.02	(± 0.006) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.002	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	16.7	(± 1.67) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	28	(± 7) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	37.4	(± 1.87) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	41.2	(± 0.8) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.172	(± 0.034) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	<0.005	(± 0.002) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	<0.002	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.04	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0018	(± 0.0004) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	146	(± 15) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

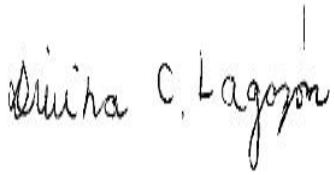
NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

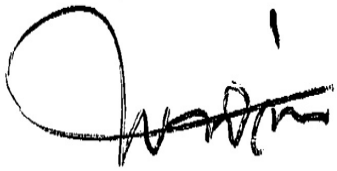
Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

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LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017532-01** REPORT DATE **17/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116448
Contract: Landfill

SAMPLE CODE **812-2023-00047476**

Client Reference: 283044-0
Product: Ground water
Sampling Point code: WIL-F2 **Sampling Point name:** Levin F2
Reception Date & Time: 05/04/2023 16:20
Analysis Start Date & Time: 05/04/2023 16:33 **Analysis Ending Date:** 17/04/2023
Sampled Date & Time 04/04/2023 10:45 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.01	(± 0.004) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	6.47	(± 0.65) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	<15	(± 5) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	24.0	(± 1.20) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	22.4	(± 0.4) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.133	(± 0.027) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.026	(± 0.005) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.002	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.04	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0006	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	59	(± 6) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
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	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
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	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

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ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor

Leo Cleave Senior Analyst Senior Analyst

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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017530-01** REPORT DATE **17/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116448
Contract: Landfill

SAMPLE CODE **812-2023-00047471**

Client Reference: 283045-0
Product: Ground water
Sampling Point code: WIL-F3 **Sampling Point name:** Levin F3
Reception Date & Time: 05/04/2023 16:17
Analysis Start Date & Time: 05/04/2023 16:33 **Analysis Ending Date:** 17/04/2023
Sampled Date & Time 04/04/2023 10:45 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	<0.01	(± 0.004) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	4.67	(± 0.47) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	<15	(± 5) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	16.1	(± 0.81) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	18.3	(± 0.4) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.152	(± 0.030) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	<0.005	(± 0.002) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.002	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.03	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	56	(± 6) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS	(UNCERTAINTY)	LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

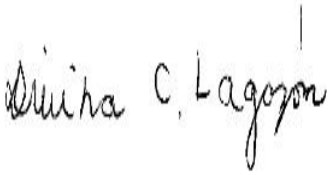
NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

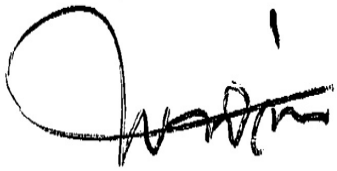
Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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The tests are identified by a five-digit code, their description is available on request.
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Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017533-01** REPORT DATE **17/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
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NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116448
Contract: Landfill

SAMPLE CODE **812-2023-00047485**

Client Reference: 283025-0
Product: Ground water
Sampling Point code: WIL-G1D **Sampling Point name:** Levin G1D
Reception Date & Time: 05/04/2023 16:27
Analysis Start Date & Time: 05/04/2023 16:33 **Analysis Ending Date:** 17/04/2023
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.10	(± 0.03) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.002	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	9.06	(± 0.91) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	16	(± 6) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	31.7	(± 1.58) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	28.2	(± 0.6) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.019	(± 0.004) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.230	(± 0.046) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	<0.002	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.04	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002

		RESULTS	(UNCERTAINTY)	LOQ
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	64	(± 6) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

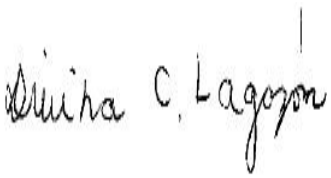
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.	NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.	NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.	NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

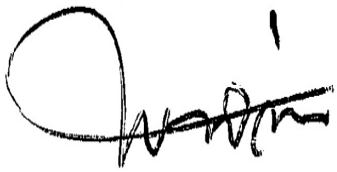
Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst



Maria Norris Laboratory Manager, Microbiology

Ganesh Ilancko Supervisor

EXPLANATORY NOTE

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⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017529-01** REPORT DATE **17/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116448
Contract: Landfill

SAMPLE CODE **812-2023-00047470**

Client Reference: 283040-0
Product: Ground water
Sampling Point code: WIL-G1S **Sampling Point name:** Levin G1S
Reception Date & Time: 05/04/2023 16:15
Analysis Start Date & Time: 05/04/2023 16:33 **Analysis Ending Date:** 17/04/2023
Sampled Date & Time 04/04/2023 10:44 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.03	(± 0.01) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.002	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	8.77	(± 0.88) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	45	(± 8) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	72.0	(± 3.60) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	46.2	(± 0.9) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.040	(± 0.008) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	2.05	(± 0.205) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.065	(± 0.007) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.03	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0056	(± 0.0011) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	92	(± 9) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor

Leo Cleave Senior Analyst Senior Analyst

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⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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The tests are identified by a five-digit code, their description is available on request.
Accreditation does not apply to comments or graphical representations.
Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 85 Port Road, Seaview, Lower Hutt, Wellington, NEW ZEALAND.
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The Customer acknowledges and accepts that: (a) it is solely responsible for the sampling process and warrants that the sample provided to Eurofins is representative of the lot / batch from which the samples were drawn; and (b) Eurofins expresses no opinion and accepts no liability in respect of the Customer's production process or homogeneity of the sample.
The Eurofins water sampling services uses IANZ approved methodology based on AS/NZS 5667 and / or best practice to collect and transport samples that are fit for the purpose of analytical testing. Eurofins shall have no liability if the sample collected is not representative of the source from which it has been taken. The laboratory is not responsible for sampling activities unless explicitly indicated by the statement "Sampled by Eurofins" on the report for water samples.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017528-01** REPORT DATE **17/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00116448
Contract: Landfill

SAMPLE CODE **812-2023-00047467**

Client Reference: 283041-0
Product: Ground water
Sampling Point code: WIL-G2 **Sampling Point name:** Levin G2s
Reception Date & Time: 05/04/2023 16:13
Analysis Start Date & Time: 05/04/2023 16:33 **Analysis Ending Date:** 17/04/2023
Sampled Date & Time 04/04/2023 10:43 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.03	(± 0.010) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	<0.001	(± 0.0003) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	64.5	(± 6.45) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	27	(± 6) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	342	(± 17.1) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	157	(± 3.1) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.012	(± 0.003) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.036	(± 0.007) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.002	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.60	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0030	(± 0.0006) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	259	(± 26) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor

Leo Cleave Senior Analyst Senior Analyst

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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85 Port Road
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The tests are identified by a five-digit code, their description is available on request.
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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-036156-01** REPORT DATE **21/07/2023**

Attention Downer NZ Ltd (EDI Levin)
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NEW ZEALAND

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Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00117909
Contract: Landfill

SAMPLE CODE **812-2023-00051960**

Client Reference: 283050-0
Product: Ground water
Sampling Point code: WIL-HS1 **Sampling Point name:** Levin HS1
Reception Date & Time: 14/04/2023 17:21
Analysis Start Date & Time: 14/04/2023 17:23 **Analysis Ending Date:** 21/07/2023
Sampled Date & Time 13/04/2023 12:57 **Sampler(s)** Client nominated external sampler
Collected By Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.02	(± 0.006) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	18	(± 6) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	23.9	(± 1.19) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	22.6	(± 0.5) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.013	(± 0.001) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	0.003	(± 0.0004) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	0.07	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	11.7	(± 1.17) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	0.0011	(± 0.0003) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	0.101	(± 0.020) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	7.96	(± 0.80) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	0.0178	(± 0.0036) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	<0.0005	(± 0.0002) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	2.47	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.277	(± 0.055) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	19.4	(± 1.94) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	0.003	(± 0.0008) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	0.13	(± 0.03) mg/l	0.01
NW195	**pH**			
	pH	7.6	(± 0.2)	0.1
VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	14.9	(± 0.74) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	8	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	60	(± 6) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	62	(± 6) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	7.1	(± 0.7) mg/l	0.1
VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS (UNCERTAINTY)		LOQ
VQ876	**Volatile Fatty Acids (VFA) by GC-MS**		
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW011 **Sulphate:** APHA Online Edition 4110 B

NW020 **Chemical Oxygen Demand:** APHA Online Edition 5220 D

NW023 **Conductivity:** APHA Online Edition 2510 B

NW029 **Total Hardness:** APHA Online Edition 2340 B

NW098 **Dissolved Aluminium:** APHA Online Edition 3125 B mod.

NW103 **Dissolved Boron:** APHA Online Edition 3125 B mod.

NW104 **Dissolved Cadmium:** APHA Online Edition 3125 B mod.

NW106 **Dissolved Chromium:** APHA Online Edition 3125 B mod.

NW108 **Dissolved Copper:** APHA Online Edition 3125 B mod.

NW110 **Dissolved Lead:** APHA Online Edition 3125 B mod.

NW113 **Dissolved Manganese:** APHA Online Edition 3125 B mod.

NW114 **Dissolved Mercury:** APHA Online Edition 3125 B mod.

NW116 **Dissolved Nickel:** APHA Online Edition 3125 B mod.

NW117 **Dissolved Potassium:** APHA Online Edition 3125 B mod.

NW125 **Dissolved Zinc:** APHA Online Edition 3125 B mod.

NW179 **Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H

NW193 **Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G

NW195 **pH:** APHA Online Edition 4500-H B

NW206 **Suspended Solids:** APHA Online Edition 2540 D

NW210 **Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B

NW341 **BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B

NW457 **Dissolved Calcium:** APHA Online Edition 3120 B mod.

NW460 **Dissolved Iron:** APHA Online Edition 3120 B mod.

NW462 **Dissolved Magnesium:** APHA Online Edition 3120 B mod.

NW469 **Dissolved Sodium:** APHA Online Edition 3120 B mod.

NW583 **Dissolved Arsenic:** APHA Online Edition 3125 B mod.

VQ088 **Phenolics (Total):**

VQ876 **Volatile Fatty Acids (VFA) by GC-MS:**

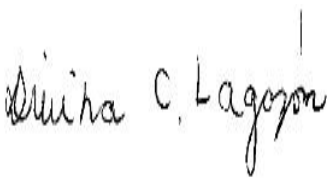
ZM2GA **Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Leo Cleave Senior Analyst Microbiology

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

EXPLANATORY NOTE

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⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-015830-01** REPORT DATE **06/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00108595
Contract: Landfill

SAMPLE CODE **812-2023-00020628**

Client Reference: 275092-0
Product: Ground water
Sampling Point code: WIL-HS1 **Sampling Point name:** Levin HS1
Reception Date & Time: 17/02/2023 13:41
Analysis Start Date & Time: 17/02/2023 13:56 **Analysis Ending Date:** 06/04/2023
Sampled Date & Time 16/02/2023 07:30 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.04	(± 0.01) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	<0.001	(± 0.0003) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	(± 0.8) mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	10.4	(± 1.04) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	57	(± 10) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	23.0	(± 1.15) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	21.1	(± 0.4) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.208	(± 0.042) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	1000	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.074	(± 0.015) mg/l	0.005
NW462	**Magnesium - Dissolved**			
	Magnesium (Mg)	5.56	(± 0.56) mg/l	0.01
NW010	**Nitrate-N**			
	Nitrate-N	0.07	(± 0.02) mg/l	0.01
NW195	**pH**			

		RESULTS	(UNCERTAINTY)	LOQ
NW195	**pH**			
	pH	8.6	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW469	**Sodium - Dissolved**			
	Sodium (Na)	20.7	(± 2.07) mg/l	0.02
NW098	**Soluble Aluminium**			
	Aluminium	0.019	(± 0.002) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.05	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0008	(± 0.0002) mg/l	0.0005
NW110	**Soluble Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW113	**Soluble Manganese**			
	Manganese (Mn)	0.0054	(± 0.0011) mg/l	0.0005
NW114	**Soluble Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Soluble Nickel**			
	Nickel (Ni)	<0.0005	(± 0.0002) mg/l	0.0005
NW117	**Soluble Potassium**			
	Potassium (K)	1.06	mg/l	0.01
NW125	**Soluble Zinc**			
	Zinc (Zn)	<0.002	(± 0.0007) mg/l	0.002
NW011	**Sulphate**			
	Sulphate	18.1	(± 0.91) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	26	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	62	(± 6) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	49	(± 5) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	8.3	(± 0.8) mg/l	0.1
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS (UNCERTAINTY)		LOQ
③VQ876 **Volatile Fatty Acids (VFA) by GC-MS**			
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B	NW007	**Chloride:** APHA Online Edition 4110 B
NW010	**Nitrate-N:** APHA Online Edition 4110 B	NW011	**Sulphate:** APHA Online Edition 4110 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.	NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.	NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW110	**Soluble Lead:** APHA Online Edition 3125 B mod.	NW113	**Soluble Manganese:** APHA Online Edition 3125 B mod.
NW114	**Soluble Mercury:** APHA Online Edition 3125 B mod.	NW116	**Soluble Nickel:** APHA Online Edition 3125 B mod.
NW117	**Soluble Potassium:** APHA Online Edition 3125 B mod.	NW125	**Soluble Zinc:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW195	**pH:** APHA Online Edition 4500-H B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW462	**Magnesium - Dissolved:** APHA Online Edition 3120 B mod.	NW469	**Sodium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	VQ088	**Phenolics (Total):** APHA 5530
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Gordon McArthur Senior laboratory Analyst

Ivan Imamura Laboratory Analyst

Leo Cleave Senior Analyst Senior Analyst

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-024905-01** REPORT DATE **22/05/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00112294
Contract: Landfill

SAMPLE CODE **812-2023-00031594**

Client Reference: 279130-0
Product: Ground water
Sampling Point code: WIL-HS1 **Sampling Point name:** Levin HS1
Reception Date & Time: 10/03/2023 17:29
Analysis Start Date & Time: 10/03/2023 17:42 **Analysis Ending Date:** 22/05/2023
Sampled Date & Time 08/03/2023 13:08 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.12	(± 0.03) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.004	(± 0.0005) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	(± 0.8) mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	12.4	(± 1.24) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	33	(± 7) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	23.2	(± 1.16) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	22.1	(± 0.4) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.373	(± 0.075) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.156	(± 0.031) mg/l	0.005
NW462	**Magnesium - Dissolved**			
	Magnesium (Mg)	6.66	(± 0.67) mg/l	0.01
NW010	**Nitrate-N**			
	Nitrate-N	0.14	(± 0.03) mg/l	0.01
NW195	**pH**			

		RESULTS	(UNCERTAINTY)	LOQ
NW195	**pH**			
	pH	7.8	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW469	**Sodium - Dissolved**			
	Sodium (Na)	25.2	(± 2.52) mg/l	0.02
NW098	**Soluble Aluminium**			
	Aluminium	0.011	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.05	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0008	(± 0.0002) mg/l	0.0005
NW110	**Soluble Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW113	**Soluble Manganese**			
	Manganese (Mn)	0.0179	(± 0.0036) mg/l	0.0005
NW114	**Soluble Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Soluble Nickel**			
	Nickel (Ni)	<0.0005	(± 0.0002) mg/l	0.0005
NW117	**Soluble Potassium**			
	Potassium (K)	1.86	mg/l	0.01
NW125	**Soluble Zinc**			
	Zinc (Zn)	<0.002	(± 0.0007) mg/l	0.002
NW011	**Sulphate**			
	Sulphate	16.0	(± 0.80) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	6	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	59	(± 6) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	58	(± 6) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	7.1	(± 0.7) mg/l	0.1
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS (UNCERTAINTY)		LOQ
③VQ876 **Volatile Fatty Acids (VFA) by GC-MS**			
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B	NW007	**Chloride:** APHA Online Edition 4110 B
NW010	**Nitrate-N:** APHA Online Edition 4110 B	NW011	**Sulphate:** APHA Online Edition 4110 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
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NW117	**Soluble Potassium:** APHA Online Edition 3125 B mod.	NW125	**Soluble Zinc:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW195	**pH:** APHA Online Edition 4500-H B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW462	**Magnesium - Dissolved:** APHA Online Edition 3120 B mod.	NW469	**Sodium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	VQ088	**Phenolics (Total):** APHA 5530
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Sunita Raju Business Unit Manager

EXPLANATORY NOTE

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Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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Eurofins will not be required to store samples and may destroy or otherwise dispose of the samples or return the samples to the Customer (at the Customer's cost in all respects) immediately following analysis of the samples.
If the Customer pays for storage of the samples Eurofins will take commercially reasonable steps to store the samples for the agreed period in terms of industry practice.
The Customer acknowledges and accepts that: (a) it is solely responsible for the sampling process and warrants that the sample provided to Eurofins is representative of the lot / batch from which the samples were drawn; and (b) Eurofins expresses no opinion and accepts no liability in respect of the Customer's production process or homogeneity of the sample.
The Eurofins water sampling services uses IANZ approved methodology based on AS/NZS 5667 and / or best practice to collect and transport samples that are fit for the purpose of analytical testing. Eurofins shall have no liability if the sample collected is not representative of the source from which it has been taken. The laboratory is not responsible for sampling activities unless explicitly indicated by the statement "Sampled by Eurofins" on the report for water samples.
The Customer acknowledges that the Services are provided using the then current state of technology and methods developed and generally applied by Eurofins and involve analysis, interpretations, consulting work and conclusions. Eurofins shall use commercially reasonable degree of care in providing the Services.
This report is produced and issued on the basis of information, documents and/or samples provided by, or on behalf of, the Customer and solely for the benefit of the Customer who is responsible for acting as it sees fit on the basis of this report. Neither Eurofins nor any of its officers, employees, agents or subcontractors shall be liable to the Customer nor any third party for any actions taken or not taken on the basis of this report nor for any incorrect results arising from unclear, erroneous, incomplete, misleading or false information provided to Eurofins.
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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-036153-01** REPORT DATE **21/07/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00117909
Contract: Landfill

SAMPLE CODE **812-2023-00051954**

Client Reference: 283051-0
Product: Ground water
Sampling Point code: WIL-HS1A **Sampling Point name:** Levin HS1A
Reception Date & Time: 14/04/2023 17:13
Analysis Start Date & Time: 14/04/2023 17:23 **Analysis Ending Date:** 21/07/2023
Sampled Date & Time 13/04/2023 12:54 **Sampler(s)** Client nominated external sampler
Collected By Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.04	(± 0.01) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	28	(± 7) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	23.1	(± 1.15) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	23.2	(± 0.5) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.025	(± 0.003) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	0.003	(± 0.0005) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	0.07	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	12.2	(± 1.22) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	0.0014	(± 0.0003) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	0.119	(± 0.024) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	8.30	(± 0.83) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	0.0211	(± 0.0042) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	0.0006	(± 0.0003) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	2.45	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.281	(± 0.056) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	20.8	(± 2.08) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	0.007	(± 0.001) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	5400	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	0.14	(± 0.04) mg/l	0.01
NW195	**pH**			
	pH	7.4	(± 0.2)	0.1
VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	14.5	(± 0.73) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	12	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	59	(± 6) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	65	(± 6) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	6.8	(± 0.7) mg/l	0.1
VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS (UNCERTAINTY)		LOQ
VQ876	**Volatile Fatty Acids (VFA) by GC-MS**		
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW011 **Sulphate:** APHA Online Edition 4110 B

NW020 **Chemical Oxygen Demand:** APHA Online Edition 5220 D

NW023 **Conductivity:** APHA Online Edition 2510 B

NW029 **Total Hardness:** APHA Online Edition 2340 B

NW098 **Dissolved Aluminium:** APHA Online Edition 3125 B mod.

NW103 **Dissolved Boron:** APHA Online Edition 3125 B mod.

NW104 **Dissolved Cadmium:** APHA Online Edition 3125 B mod.

NW106 **Dissolved Chromium:** APHA Online Edition 3125 B mod.

NW108 **Dissolved Copper:** APHA Online Edition 3125 B mod.

NW110 **Dissolved Lead:** APHA Online Edition 3125 B mod.

NW113 **Dissolved Manganese:** APHA Online Edition 3125 B mod.

NW114 **Dissolved Mercury:** APHA Online Edition 3125 B mod.

NW116 **Dissolved Nickel:** APHA Online Edition 3125 B mod.

NW117 **Dissolved Potassium:** APHA Online Edition 3125 B mod.

NW125 **Dissolved Zinc:** APHA Online Edition 3125 B mod.

NW179 **Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H

NW193 **Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G

NW195 **pH:** APHA Online Edition 4500-H B

NW206 **Suspended Solids:** APHA Online Edition 2540 D

NW210 **Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B

NW341 **BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B

NW457 **Dissolved Calcium:** APHA Online Edition 3120 B mod.

NW460 **Dissolved Iron:** APHA Online Edition 3120 B mod.

NW462 **Dissolved Magnesium:** APHA Online Edition 3120 B mod.

NW469 **Dissolved Sodium:** APHA Online Edition 3120 B mod.

NW583 **Dissolved Arsenic:** APHA Online Edition 3125 B mod.

VQ088 **Phenolics (Total):**

VQ876 **Volatile Fatty Acids (VFA) by GC-MS:**

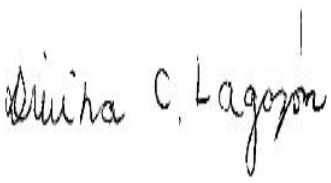
ZM2GA **Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Leo Cleave Senior Analyst Microbiology

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

EXPLANATORY NOTE

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③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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The tests are identified by a five-digit code, their description is available on request.
Accreditation does not apply to comments or graphical representations.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-015829-01** REPORT DATE **06/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00108595
Contract: Landfill

SAMPLE CODE **812-2023-00020626**

Client Reference: 275093-0
Product: Ground water
Sampling Point code: WIL-HS1A **Sampling Point name:** Levin HS1A
Reception Date & Time: 17/02/2023 13:41
Analysis Start Date & Time: 17/02/2023 13:56 **Analysis Ending Date:** 06/04/2023
Sampled Date & Time 16/02/2023 07:15 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.02	(± 0.007) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.003	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	(± 0.8) mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	10.8	(± 1.08) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	53	(± 9) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	22.7	(± 1.13) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	20.9	(± 0.4) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.203	(± 0.041) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	900	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.098	(± 0.020) mg/l	0.005
NW462	**Magnesium - Dissolved**			
	Magnesium (Mg)	5.90	(± 0.59) mg/l	0.01
NW010	**Nitrate-N**			
	Nitrate-N	0.07	(± 0.02) mg/l	0.01
NW195	**pH**			

		RESULTS	(UNCERTAINTY)	LOQ
NW195	**pH**			
	pH	8.6	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW469	**Sodium - Dissolved**			
	Sodium (Na)	21.8	(± 2.18) mg/l	0.02
NW098	**Soluble Aluminium**			
	Aluminium	2580	(± 260) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.05	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0010	(± 0.0003) mg/l	0.0005
NW110	**Soluble Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW113	**Soluble Manganese**			
	Manganese (Mn)	0.0098	(± 0.0020) mg/l	0.0005
NW114	**Soluble Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Soluble Nickel**			
	Nickel (Ni)	<0.0005	(± 0.0002) mg/l	0.0005
NW117	**Soluble Potassium**			
	Potassium (K)	1.68	mg/l	0.01
NW125	**Soluble Zinc**			
	Zinc (Zn)	<0.002	(± 0.0007) mg/l	0.002
NW011	**Sulphate**			
	Sulphate	18.1	(± 0.91) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	35	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	61	(± 6) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	51	(± 5) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	8.4	(± 0.8) mg/l	0.1
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS (UNCERTAINTY)		LOQ
③VQ876 **Volatile Fatty Acids (VFA) by GC-MS**			
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B	NW007	**Chloride:** APHA Online Edition 4110 B
NW010	**Nitrate-N:** APHA Online Edition 4110 B	NW011	**Sulphate:** APHA Online Edition 4110 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.	NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.	NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW110	**Soluble Lead:** APHA Online Edition 3125 B mod.	NW113	**Soluble Manganese:** APHA Online Edition 3125 B mod.
NW114	**Soluble Mercury:** APHA Online Edition 3125 B mod.	NW116	**Soluble Nickel:** APHA Online Edition 3125 B mod.
NW117	**Soluble Potassium:** APHA Online Edition 3125 B mod.	NW125	**Soluble Zinc:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW195	**pH:** APHA Online Edition 4500-H B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW462	**Magnesium - Dissolved:** APHA Online Edition 3120 B mod.	NW469	**Sodium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	VQ088	**Phenolics (Total):** APHA 5530
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Gordon McArthur Senior laboratory Analyst

Ivan Imamura Laboratory Analyst

Leo Cleave Senior Analyst Senior Analyst

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
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⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-024904-01** REPORT DATE **22/05/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00112294
Contract: Landfill

SAMPLE CODE **812-2023-00031588**

Client Reference: 279135-0
Product: Ground water
Sampling Point code: WIL-HS1A **Sampling Point name:** Levin HS1A
Reception Date & Time: 10/03/2023 17:27
Analysis Start Date & Time: 10/03/2023 17:42 **Analysis Ending Date:** 22/05/2023
Sampled Date & Time 08/03/2023 13:09 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.07	(± 0.02) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.004	(± 0.0005) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	(± 0.8) mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	12.4	(± 1.24) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	44	(± 8) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	23.6	(± 1.18) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	21.8	(± 0.4) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.382	(± 0.076) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.148	(± 0.030) mg/l	0.005
NW462	**Magnesium - Dissolved**			
	Magnesium (Mg)	6.68	(± 0.67) mg/l	0.01
NW010	**Nitrate-N**			
	Nitrate-N	0.15	(± 0.04) mg/l	0.01
NW195	**pH**			

		RESULTS	(UNCERTAINTY)	LOQ
NW195	**pH**			
	pH	7.7	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW469	**Sodium - Dissolved**			
	Sodium (Na)	25.2	(± 2.52) mg/l	0.02
NW098	**Soluble Aluminium**			
	Aluminium	0.011	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.06	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0009	(± 0.0003) mg/l	0.0005
NW110	**Soluble Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW113	**Soluble Manganese**			
	Manganese (Mn)	0.0154	(± 0.0031) mg/l	0.0005
NW114	**Soluble Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Soluble Nickel**			
	Nickel (Ni)	0.0006	(± 0.0002) mg/l	0.0005
NW117	**Soluble Potassium**			
	Potassium (K)	1.95	mg/l	0.01
NW125	**Soluble Zinc**			
	Zinc (Zn)	0.006	(± 0.0009) mg/l	0.002
NW011	**Sulphate**			
	Sulphate	16.4	(± 0.82) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	39	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	47	(± 5) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	58	(± 6) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	7.0	(± 0.7) mg/l	0.1
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS	(UNCERTAINTY)	LOQ
③VQ876 **Volatile Fatty Acids (VFA) by GC-MS**			
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B	NW007	**Chloride:** APHA Online Edition 4110 B
NW010	**Nitrate-N:** APHA Online Edition 4110 B	NW011	**Sulphate:** APHA Online Edition 4110 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.	NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.	NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW110	**Soluble Lead:** APHA Online Edition 3125 B mod.	NW113	**Soluble Manganese:** APHA Online Edition 3125 B mod.
NW114	**Soluble Mercury:** APHA Online Edition 3125 B mod.	NW116	**Soluble Nickel:** APHA Online Edition 3125 B mod.
NW117	**Soluble Potassium:** APHA Online Edition 3125 B mod.	NW125	**Soluble Zinc:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW195	**pH:** APHA Online Edition 4500-H B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW462	**Magnesium - Dissolved:** APHA Online Edition 3120 B mod.	NW469	**Sodium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	VQ088	**Phenolics (Total):** APHA 5530
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Sunita Raju Business Unit Manager

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE	AR-23-NW-036155-01	REPORT DATE	21/07/2023

Attention Downer NZ Ltd (EDI Levin)
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Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes
Contract: Landfill
Order code: EUNZWE-00117909

SAMPLE CODE 812-2023-00051958

Client Reference: 283052-0
Product: Ground water
Sampling Point code: WIL-HS2
Sampling Point name: Levin HS2
Reception Date & Time: 14/04/2023 17:18
Analysis Start Date & Time: 14/04/2023 17:23
Analysis Ending Date: 21/07/2023
Sampled Date & Time 13/04/2023 12:56
Sampler(s) Client nominated external sampler
Collected By Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.02	(± 0.007) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	25	(± 6) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	23.9	(± 1.19) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	23.1	(± 0.5) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.017	(± 0.002) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	0.003	(± 0.0004) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	0.08	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	12.8	(± 1.28) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	0.0010	(± 0.0003) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	0.139	(± 0.028) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	8.42	(± 0.84) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	0.0200	(± 0.0040) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	<0.0005	(± 0.0002) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	2.66	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.265	(± 0.053) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	20.3	(± 2.03) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	0.002	(± 0.0007) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	500	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	0.20	(± 0.05) mg/l	0.01
NW195	**pH**			
	pH	7.5	(± 0.2)	0.1
VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	15.3	(± 0.77) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	40	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	59	(± 6) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	67	(± 7) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	6.9	(± 0.7) mg/l	0.1
VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS (UNCERTAINTY)		LOQ
VQ876	**Volatile Fatty Acids (VFA) by GC-MS**		
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B	NW007	**Chloride:** APHA Online Edition 4110 B
NW010	**Nitrate-N:** APHA Online Edition 4110 B	NW011	**Sulphate:** APHA Online Edition 4110 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW098	**Dissolved Aluminium:** APHA Online Edition 3125 B mod.
NW103	**Dissolved Boron:** APHA Online Edition 3125 B mod.	NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.
NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.	NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.
NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.	NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.
NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.	NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.
NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.	NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW195	**pH:** APHA Online Edition 4500-H B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.	NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.
NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	VQ088	**Phenolics (Total):**
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:**	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Leo Cleave Senior Analyst Microbiology

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EXPLANATORY NOTE

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⑤Test is subcontracted outside Eurofins group and is not accredited
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⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-015827-01** REPORT DATE **06/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00108595
Contract: Landfill

SAMPLE CODE **812-2023-00020623**

Client Reference: 274951-0
Product: Ground water
Sampling Point code: WIL-HS2 **Sampling Point name:** Levin HS2
Reception Date & Time: 17/02/2023 13:41
Analysis Start Date & Time: 17/02/2023 13:56 **Analysis Ending Date:** 06/04/2023
Sampled Date & Time 16/02/2023 07:50 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	1.23	(± 0.18) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.002	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	(± 0.8) mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	15.4	(± 1.54) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	68	(± 11) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	38.6	(± 1.93) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	35.2	(± 0.7) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.143	(± 0.029) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	1000	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.316	(± 0.063) mg/l	0.005
NW462	**Magnesium - Dissolved**			
	Magnesium (Mg)	8.83	(± 0.88) mg/l	0.01
NW010	**Nitrate-N**			
	Nitrate-N	0.19	(± 0.05) mg/l	0.01
NW195	**pH**			

		RESULTS	(UNCERTAINTY)	LOQ
NW195	**pH**			
	pH	7.8	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW469	**Sodium - Dissolved**			
	Sodium (Na)	31.4	(± 3.14) mg/l	0.02
NW098	**Soluble Aluminium**			
	Aluminium	0.023	(± 0.002) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.14	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0009	(± 0.0002) mg/l	0.0005
NW110	**Soluble Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW113	**Soluble Manganese**			
	Manganese (Mn)	0.0314	(± 0.0063) mg/l	0.0005
NW114	**Soluble Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Soluble Nickel**			
	Nickel (Ni)	0.0007	(± 0.0003) mg/l	0.0005
NW117	**Soluble Potassium**			
	Potassium (K)	7.62	mg/l	0.01
NW125	**Soluble Zinc**			
	Zinc (Zn)	<0.002	(± 0.0007) mg/l	0.002
NW011	**Sulphate**			
	Sulphate	14.7	(± 0.73) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	36	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	94	(± 9) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	75	(± 7) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	12.7	(± 1.3) mg/l	0.1
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS (UNCERTAINTY)		LOQ
③VQ876 **Volatile Fatty Acids (VFA) by GC-MS**			
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B	NW007	**Chloride:** APHA Online Edition 4110 B
NW010	**Nitrate-N:** APHA Online Edition 4110 B	NW011	**Sulphate:** APHA Online Edition 4110 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.	NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.	NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW110	**Soluble Lead:** APHA Online Edition 3125 B mod.	NW113	**Soluble Manganese:** APHA Online Edition 3125 B mod.
NW114	**Soluble Mercury:** APHA Online Edition 3125 B mod.	NW116	**Soluble Nickel:** APHA Online Edition 3125 B mod.
NW117	**Soluble Potassium:** APHA Online Edition 3125 B mod.	NW125	**Soluble Zinc:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW195	**pH:** APHA Online Edition 4500-H B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW462	**Magnesium - Dissolved:** APHA Online Edition 3120 B mod.	NW469	**Sodium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	VQ088	**Phenolics (Total):** APHA 5530
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Gordon McArthur Senior laboratory Analyst

Ivan Imamura Laboratory Analyst

Leo Cleave Senior Analyst Senior Analyst

EXPLANATORY NOTE

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②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
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⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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If the Customer pays for storage of the samples Eurofins will take commercially reasonable steps to store the samples for the agreed period in terms of industry practice.
The Customer acknowledges and accepts that: (a) it is solely responsible for the sampling process and warrants that the sample provided to Eurofins is representative of the lot / batch from which the samples were drawn; and (b) Eurofins expresses no opinion and accepts no liability in respect of the Customer's production process or homogeneity of the sample.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-024903-01** REPORT DATE **22/05/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00112294
Contract: Landfill

SAMPLE CODE **812-2023-00031582**

Client Reference: 279054-0
Product: Ground water
Sampling Point code: WIL-HS2 **Sampling Point name:** Levin HS2
Reception Date & Time: 10/03/2023 17:23
Analysis Start Date & Time: 10/03/2023 17:42 **Analysis Ending Date:** 22/05/2023
Sampled Date & Time 08/03/2023 13:08 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	3.67	(± 0.55) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.002	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	(± 0.8) mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	29.0	(± 2.90) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	60	(± 10) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	48.7	(± 2.44) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	39.9	(± 0.8) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.159	(± 0.032) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.305	(± 0.061) mg/l	0.005
NW462	**Magnesium - Dissolved**			
	Magnesium (Mg)	14.9	(± 1.49) mg/l	0.01
NW010	**Nitrate-N**			
	Nitrate-N	0.26	(± 0.06) mg/l	0.01
NW195	**pH**			

		RESULTS	(UNCERTAINTY)	LOQ
NW195	**pH**			
	pH	7.2	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW469	**Sodium - Dissolved**			
	Sodium (Na)	49.2	(± 4.92) mg/l	0.02
NW098	**Soluble Aluminium**			
	Aluminium	0.009	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.15	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0006	(± 0.0002) mg/l	0.0005
NW110	**Soluble Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW113	**Soluble Manganese**			
	Manganese (Mn)	0.124	(± 0.0124) mg/l	0.0005
NW114	**Soluble Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Soluble Nickel**			
	Nickel (Ni)	0.0008	(± 0.0003) mg/l	0.0005
NW117	**Soluble Potassium**			
	Potassium (K)	11.2	mg/l	0.01
NW125	**Soluble Zinc**			
	Zinc (Zn)	<0.002	(± 0.0007) mg/l	0.002
NW011	**Sulphate**			
	Sulphate	9.38	(± 0.94) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	87	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	111	(± 11) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	134	(± 13) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	14.1	(± 1.4) mg/l	0.1
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS	(UNCERTAINTY)	LOQ
③VQ876 **Volatile Fatty Acids (VFA) by GC-MS**			
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B	NW007	**Chloride:** APHA Online Edition 4110 B
NW010	**Nitrate-N:** APHA Online Edition 4110 B	NW011	**Sulphate:** APHA Online Edition 4110 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.	NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
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NW117	**Soluble Potassium:** APHA Online Edition 3125 B mod.	NW125	**Soluble Zinc:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW195	**pH:** APHA Online Edition 4500-H B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW462	**Magnesium - Dissolved:** APHA Online Edition 3120 B mod.	NW469	**Sodium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	VQ088	**Phenolics (Total):** APHA 5530
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Sunita Raju Business Unit Manager

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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-036154-01** REPORT DATE **21/07/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes
Contract: Landfill
Order code: EUNZWE-00117909

SAMPLE CODE **812-2023-00051957**

Client Reference: 283053-0
Product: Ground water
Sampling Point code: WIL-HS3
Sampling Point name: Levin HS3
Reception Date & Time: 14/04/2023 17:16
Analysis Start Date & Time: 14/04/2023 17:23
Analysis Ending Date: 21/07/2023
Sampled Date & Time 13/04/2023 12:55
Sampler(s) Client nominated external sampler
Collected By Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.04	(± 0.01) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	20	(± 6) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	24.1	(± 1.21) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	23.3	(± 0.5) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.015	(± 0.002) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	0.003	(± 0.0004) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	0.08	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	12.3	(± 1.23) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	0.0013	(± 0.0003) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	0.116	(± 0.023) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	8.03	(± 0.80) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	0.0228	(± 0.0046) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	<0.0005	(± 0.0002) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	2.71	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.257	(± 0.051) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	19.6	(± 1.96) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	0.004	(± 0.0008) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	400	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	0.22	(± 0.06) mg/l	0.01
NW195	**pH**			
	pH	7.5	(± 0.2)	0.1
VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	15.3	(± 0.77) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	8	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	63	(± 6) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	64	(± 6) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	7.0	(± 0.7) mg/l	0.1
VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS (UNCERTAINTY)		LOQ
VQ876	**Volatile Fatty Acids (VFA) by GC-MS**		
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B	NW007	**Chloride:** APHA Online Edition 4110 B
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NW195	**pH:** APHA Online Edition 4500-H B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
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NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	VQ088	**Phenolics (Total):**
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:**	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Leo Cleave Senior Analyst Microbiology

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

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www.eurofins.co.nz

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The Customer acknowledges and accepts that: (a) it is solely responsible for the sampling process and warrants that the sample provided to Eurofins is representative of the lot / batch from which the samples were drawn; and (b) Eurofins expresses no opinion and accepts no liability in respect of the Customer's production process or homogeneity of the sample.
The Eurofins water sampling services uses IANZ approved methodology based on AS/NZS 5667 and / or best practice to collect and transport samples that are fit for the purpose of analytical testing. Eurofins shall have no liability if the sample collected is not representative of the source from which it has been taken. The laboratory is not responsible for sampling activities unless explicitly indicated by the statement "Sampled by Eurofins" on the report for water samples.
The Customer acknowledges that the Services are provided using the then current state of technology and methods developed and generally applied by Eurofins and involve analysis, interpretations, consulting work and conclusions. Eurofins shall use commercially reasonable degree of care in providing the Services.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-015828-01** REPORT DATE **06/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00108595
Contract: Landfill

SAMPLE CODE **812-2023-00020624**

Client Reference: 274952-0
Product: Ground water
Sampling Point code: WIL-HS3 **Sampling Point name:** Levin HS3
Reception Date & Time: 17/02/2023 13:41
Analysis Start Date & Time: 17/02/2023 13:56 **Analysis Ending Date:** 06/04/2023
Sampled Date & Time 16/02/2023 08:05 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.14	(± 0.04) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.003	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	(± 0.8) mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	11.5	(± 1.15) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	70	(± 12) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	25.2	(± 1.26) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	22.8	(± 0.5) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.202	(± 0.040) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	1500	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.106	(± 0.021) mg/l	0.005
NW462	**Magnesium - Dissolved**			
	Magnesium (Mg)	6.06	(± 0.61) mg/l	0.01
NW010	**Nitrate-N**			
	Nitrate-N	0.16	(± 0.04) mg/l	0.01
NW195	**pH**			

		RESULTS	(UNCERTAINTY)	LOQ
NW195	**pH**			
	pH	8.3	(± 0.2)	0.1
③**VQ088**	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW469	**Sodium - Dissolved**			
	Sodium (Na)	21.8	(± 2.18) mg/l	0.02
NW098	**Soluble Aluminium**			
	Aluminium	0.018	(± 0.002) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.06	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0009	(± 0.0003) mg/l	0.0005
NW110	**Soluble Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW113	**Soluble Manganese**			
	Manganese (Mn)	0.0136	(± 0.0027) mg/l	0.0005
NW114	**Soluble Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Soluble Nickel**			
	Nickel (Ni)	<0.0005	(± 0.0002) mg/l	0.0005
NW117	**Soluble Potassium**			
	Potassium (K)	2.41	mg/l	0.01
NW125	**Soluble Zinc**			
	Zinc (Zn)	<0.002	(± 0.0007) mg/l	0.002
NW011	**Sulphate**			
	Sulphate	17.9	(± 0.89) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	27	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	66	(± 7) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	54	(± 5) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	8.2	(± 0.8) mg/l	0.1
③**VQ876**	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS (UNCERTAINTY)		LOQ
③VQ876 **Volatile Fatty Acids (VFA) by GC-MS**			
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B	NW007	**Chloride:** APHA Online Edition 4110 B
NW010	**Nitrate-N:** APHA Online Edition 4110 B	NW011	**Sulphate:** APHA Online Edition 4110 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.	NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.	NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW110	**Soluble Lead:** APHA Online Edition 3125 B mod.	NW113	**Soluble Manganese:** APHA Online Edition 3125 B mod.
NW114	**Soluble Mercury:** APHA Online Edition 3125 B mod.	NW116	**Soluble Nickel:** APHA Online Edition 3125 B mod.
NW117	**Soluble Potassium:** APHA Online Edition 3125 B mod.	NW125	**Soluble Zinc:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW195	**pH:** APHA Online Edition 4500-H B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW462	**Magnesium - Dissolved:** APHA Online Edition 3120 B mod.	NW469	**Sodium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	VQ088	**Phenolics (Total):** APHA 5530
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Gordon McArthur Senior laboratory Analyst

Ivan Imamura Laboratory Analyst

Leo Cleave Senior Analyst Senior Analyst

EXPLANATORY NOTE

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②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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The tests are identified by a five-digit code, their description is available on request.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-024907-01** REPORT DATE **22/05/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00112294
Contract: Landfill

SAMPLE CODE **812-2023-00031600**

Client Reference: 279055-0
Product: Ground water
Sampling Point code: WIL-HS3 **Sampling Point name:** Levin HS3
Reception Date & Time: 10/03/2023 17:33
Analysis Start Date & Time: 10/03/2023 17:42 **Analysis Ending Date:** 22/05/2023
Sampled Date & Time 08/03/2023 13:08 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.15	(± 0.05) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.004	(± 0.0005) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	(± 0.8) mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	14.3	(± 1.43) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	33	(± 7) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	25.9	(± 1.29) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	24.4	(± 0.5) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.321	(± 0.064) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.150	(± 0.030) mg/l	0.005
NW462	**Magnesium - Dissolved**			
	Magnesium (Mg)	7.34	(± 0.73) mg/l	0.01
NW010	**Nitrate-N**			
	Nitrate-N	0.25	(± 0.06) mg/l	0.01
NW195	**pH**			

		RESULTS	(UNCERTAINTY)	LOQ
NW195	**pH**			
	pH	7.5	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW469	**Sodium - Dissolved**			
	Sodium (Na)	26.9	(± 2.69) mg/l	0.02
NW098	**Soluble Aluminium**			
	Aluminium	0.008	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.06	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0008	(± 0.0002) mg/l	0.0005
NW110	**Soluble Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW113	**Soluble Manganese**			
	Manganese (Mn)	0.0300	(± 0.0060) mg/l	0.0005
NW114	**Soluble Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Soluble Nickel**			
	Nickel (Ni)	0.0020	(± 0.0006) mg/l	0.0005
NW117	**Soluble Potassium**			
	Potassium (K)	2.33	mg/l	0.01
NW125	**Soluble Zinc**			
	Zinc (Zn)	0.002	(± 0.0007) mg/l	0.002
NW011	**Sulphate**			
	Sulphate	15.7	(± 0.78) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	21	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	64	(± 6) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	66	(± 7) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	6.8	(± 0.7) mg/l	0.1
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS	(UNCERTAINTY)	LOQ
③VQ876 **Volatile Fatty Acids (VFA) by GC-MS**			
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B	NW007	**Chloride:** APHA Online Edition 4110 B
NW010	**Nitrate-N:** APHA Online Edition 4110 B	NW011	**Sulphate:** APHA Online Edition 4110 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.	NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.	NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW110	**Soluble Lead:** APHA Online Edition 3125 B mod.	NW113	**Soluble Manganese:** APHA Online Edition 3125 B mod.
NW114	**Soluble Mercury:** APHA Online Edition 3125 B mod.	NW116	**Soluble Nickel:** APHA Online Edition 3125 B mod.
NW117	**Soluble Potassium:** APHA Online Edition 3125 B mod.	NW125	**Soluble Zinc:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW195	**pH:** APHA Online Edition 4500-H B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW462	**Magnesium - Dissolved:** APHA Online Edition 3120 B mod.	NW469	**Sodium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	VQ088	**Phenolics (Total):** APHA 5530
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Sunita Raju Business Unit Manager

EXPLANATORY NOTE

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③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE	AR-23-NW-031967-01	REPORT DATE	29/06/2023

Attention Downer NZ Ltd (EDI Levin)
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4741 Levin
NEW ZEALAND

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Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes
Contract: Landfill
Order code: EUNZWE-00117021

SAMPLE CODE 812-2023-00049225

Client Reference: 283049-0
Product: Ground water
Sampling Point code: WIL-LP
Sampling Point name: Levin Leachate Pond
Reception Date & Time: 08/04/2023 15:03
Analysis Start Date & Time: 08/04/2023 15:19
Analysis Ending Date: 26/04/2023
Sampled Date & Time 06/04/2023 09:40
Sampler(s) Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	33.6	(± 3.36) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	389	(± 39) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	165	(± 8.26) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	130	(± 2.6) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.054	(± 0.005) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	0.041	(± 0.004) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	0.99	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	16.3	(± 1.63) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	0.065	(± 0.006) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	0.286	(± 0.057) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	7.56	(± 0.76) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	0.199	(± 0.0199) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	0.0089	(± 0.0027) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	92.0	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.393	(± 0.079) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	140	(± 14.0) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	0.002	(± 0.0007) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	400	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	0.01	(± 0.005) mg/l	0.01
①**NW195**	**pH**			
	pH	7.7	(± 0.2)	0.1
NW011	**Sulphate**			
	Sulphate	8.76	(± 0.88) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	124	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	377	(± 38) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	72	(± 7) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	79.4	(± 7.9) mg/l	0.1

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW011 **Sulphate:** APHA Online Edition 4110 B

NW020 **Chemical Oxygen Demand:** APHA Online Edition 5220 D

NW023 **Conductivity:** APHA Online Edition 2510 B

NW029 **Total Hardness:** APHA Online Edition 2340 B

NW098 **Dissolved Aluminium:** APHA Online Edition 3125 B mod.

NW103 **Dissolved Boron:** APHA Online Edition 3125 B mod.

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NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.	NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.
NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.	NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.
NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.	NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.
NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.	NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.
NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.	NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G	NW195	**pH:** APHA Online Edition 4500-H B
NW206	**Suspended Solids:** APHA Online Edition 2540 D	NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B	NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.
NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.	NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.
NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.	NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online		

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Sunita Raju Business Unit Manager

Ivan Imamura Laboratory Analyst

EXPLANATORY NOTE

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Not Detected means not detected at or above the Limit of Quantification (LOQ)
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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE	AR-23-NW-036152-01	REPORT DATE	21/07/2023

Attention Downer NZ Ltd (EDI Levin)
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Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes
Contract: Landfill
Order code: EUNZWE-00117021

SAMPLE CODE 812-2023-00049227

Client Reference: 283048-0
Product: Ground water
Sampling Point code: WIL-TD1
Sampling Point name: Levin TD1
Reception Date & Time: 08/04/2023 15:09
Analysis Start Date & Time: 08/04/2023 15:19
Analysis Ending Date: 21/07/2023
Sampled Date & Time 06/04/2023 09:44
Sampler(s) Client nominated external sampler
Collected By Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	7.77	(± 1.17) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	83	(± 13) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	68.5	(± 3.43) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	65.9	(± 1.3) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.015	(± 0.002) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	<0.001	(± 0.0004) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	0.31	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	26.3	(± 2.63) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	0.0007	(± 0.0002) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	0.460	(± 0.092) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	18.0	(± 1.80) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	0.0862	(± 0.0173) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	0.0014	(± 0.0005) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	21.1	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.018	(± 0.004) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	62.4	(± 6.24) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	0.006	(± 0.0009) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	0.25	(± 0.06) mg/l	0.01
①NW195	**pH**			
	pH	8.0	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	2.36	(± 0.24) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	23	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	212	(± 21) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	140	(± 14) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	15.9	(± 1.6) mg/l	0.1
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS (UNCERTAINTY)		LOQ
③VQ876 **Volatile Fatty Acids (VFA) by GC-MS**			
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B	NW007	**Chloride:** APHA Online Edition 4110 B
NW010	**Nitrate-N:** APHA Online Edition 4110 B	NW011	**Sulphate:** APHA Online Edition 4110 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW098	**Dissolved Aluminium:** APHA Online Edition 3125 B mod.
NW103	**Dissolved Boron:** APHA Online Edition 3125 B mod.	NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.
NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.	NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.
NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.	NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.
NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.	NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.
NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.	NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW195	**pH:** APHA Online Edition 4500-H B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.	NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.
NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	VQ088	**Phenolics (Total):**
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:**	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Sunita Raju Business Unit Manager

Ivan Imamura Laboratory Analyst

EXPLANATORY NOTE

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N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-015826-01** REPORT DATE **06/04/2023**

Attention Downer NZ Ltd (EDI Levin)
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Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00108595
Contract: Landfill

SAMPLE CODE **812-2023-00020622**

Client Reference: 274950-0
Product: Ground water
Sampling Point code: WIL-TD1 **Sampling Point name:** Levin TD1
Reception Date & Time: 17/02/2023 13:41
Analysis Start Date & Time: 17/02/2023 13:56 **Analysis Ending Date:** 06/04/2023
Sampled Date & Time 16/02/2023 07:58 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	6.37	(± 0.96) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	(± 0.8) mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	33.9	(± 3.39) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	106	(± 12) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	103	(± 5.17) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	81.5	(± 1.6) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.026	(± 0.005) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	9000	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	1.04	(± 0.104) mg/l	0.005
NW462	**Magnesium - Dissolved**			
	Magnesium (Mg)	22.0	(± 2.20) mg/l	0.01
NW010	**Nitrate-N**			
	Nitrate-N	0.57	(± 0.14) mg/l	0.01
NW195	**pH**			

		RESULTS	(UNCERTAINTY)	LOQ
NW195	**pH**			
	pH	7.7	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW469	**Sodium - Dissolved**			
	Sodium (Na)	79.4	(± 7.94) mg/l	0.02
NW098	**Soluble Aluminium**			
	Aluminium	0.020	(± 0.002) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.56	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0008	(± 0.0002) mg/l	0.0005
NW110	**Soluble Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW113	**Soluble Manganese**			
	Manganese (Mn)	0.266	(± 0.0266) mg/l	0.0005
NW114	**Soluble Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Soluble Nickel**			
	Nickel (Ni)	0.0022	(± 0.0007) mg/l	0.0005
NW117	**Soluble Potassium**			
	Potassium (K)	33.1	mg/l	0.01
NW125	**Soluble Zinc**			
	Zinc (Zn)	0.004	(± 0.0008) mg/l	0.002
NW011	**Sulphate**			
	Sulphate	4.88	(± 0.49) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	25	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	237	(± 24) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	175	(± 18) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	29.0	(± 2.9) mg/l	0.1
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS (UNCERTAINTY)		LOQ
③VQ876 **Volatile Fatty Acids (VFA) by GC-MS**			
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B	NW007	**Chloride:** APHA Online Edition 4110 B
NW010	**Nitrate-N:** APHA Online Edition 4110 B	NW011	**Sulphate:** APHA Online Edition 4110 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.	NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.	NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW110	**Soluble Lead:** APHA Online Edition 3125 B mod.	NW113	**Soluble Manganese:** APHA Online Edition 3125 B mod.
NW114	**Soluble Mercury:** APHA Online Edition 3125 B mod.	NW116	**Soluble Nickel:** APHA Online Edition 3125 B mod.
NW117	**Soluble Potassium:** APHA Online Edition 3125 B mod.	NW125	**Soluble Zinc:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW195	**pH:** APHA Online Edition 4500-H B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW462	**Magnesium - Dissolved:** APHA Online Edition 3120 B mod.	NW469	**Sodium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	VQ088	**Phenolics (Total):** APHA 5530
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Gordon McArthur Senior laboratory Analyst

Ivan Imamura Laboratory Analyst

Leo Cleave Senior Analyst Senior Analyst

EXPLANATORY NOTE

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⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-024906-01** REPORT DATE **22/05/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), Yvettef

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00112294
Contract: Landfill

SAMPLE CODE **812-2023-00031599**

Client Reference: 279053-0
Product: Ground water
Sampling Point code: WIL-TD1 **Sampling Point name:** Levin TD1
Reception Date & Time: 10/03/2023 17:32
Analysis Start Date & Time: 10/03/2023 17:42 **Analysis Ending Date:** 22/05/2023
Sampled Date & Time 08/03/2023 13:10 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	11.7	(± 1.17) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	<0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<6	(± 0.8) mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	52.2	(± 5.22) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	132	(± 14) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	87.5	(± 4.38) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	95.2	(± 1.9) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.034	(± 0.007) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	5500	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.254	(± 0.051) mg/l	0.005
NW462	**Magnesium - Dissolved**			
	Magnesium (Mg)	23.1	(± 2.31) mg/l	0.01
NW010	**Nitrate-N**			
	Nitrate-N	0.70	(± 0.17) mg/l	0.01
NW195	**pH**			

		RESULTS	(UNCERTAINTY)	LOQ
NW195	**pH**			
	pH	7.5	(± 0.2)	0.1
③**VQ088**	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW469	**Sodium - Dissolved**			
	Sodium (Na)	69.2	(± 6.92) mg/l	0.02
NW098	**Soluble Aluminium**			
	Aluminium	0.008	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.25	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0007	(± 0.0002) mg/l	0.0005
NW110	**Soluble Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW113	**Soluble Manganese**			
	Manganese (Mn)	0.584	(± 0.0584) mg/l	0.0005
NW114	**Soluble Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Soluble Nickel**			
	Nickel (Ni)	0.0014	(± 0.0005) mg/l	0.0005
NW117	**Soluble Potassium**			
	Potassium (K)	21.5	mg/l	0.01
NW125	**Soluble Zinc**			
	Zinc (Zn)	0.005	(± 0.0008) mg/l	0.002
NW011	**Sulphate**			
	Sulphate	1.45	(± 0.15) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	136	mg/l	3
NW003	**Total Alkalinity**			
	Alkalinity total	326	(± 33) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	225	(± 23) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	23.6	(± 2.4) mg/l	0.1
③**VQ876**	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5

	RESULTS	(UNCERTAINTY)	LOQ
③VQ876 **Volatile Fatty Acids (VFA) by GC-MS**			
Iso caproic acid	<5	mg/l	5
Isobutyric acid	<5	mg/l	5
Isovaleric acid	<5	mg/l	5
Propionic acid	<5	mg/l	5
Valeric acid	<5	mg/l	5
Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B	NW007	**Chloride:** APHA Online Edition 4110 B
NW010	**Nitrate-N:** APHA Online Edition 4110 B	NW011	**Sulphate:** APHA Online Edition 4110 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.	NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.	NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW110	**Soluble Lead:** APHA Online Edition 3125 B mod.	NW113	**Soluble Manganese:** APHA Online Edition 3125 B mod.
NW114	**Soluble Mercury:** APHA Online Edition 3125 B mod.	NW116	**Soluble Nickel:** APHA Online Edition 3125 B mod.
NW117	**Soluble Potassium:** APHA Online Edition 3125 B mod.	NW125	**Soluble Zinc:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW195	**pH:** APHA Online Edition 4500-H B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW462	**Magnesium - Dissolved:** APHA Online Edition 3120 B mod.	NW469	**Sodium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	VQ088	**Phenolics (Total):** APHA 5530
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor

Amitesh Kumar Supervisor

Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Sunita Raju Business Unit Manager

EXPLANATORY NOTE

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⑧Tested at the sampling point by Eurofins and is accredited

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Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-018818-01** REPORT DATE **24/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
4741 Levin
NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00117021
Contract: Landfill

SAMPLE CODE **812-2023-00049226**

Client Reference: 283026-0
Product: Ground water
Sampling Point code: WIL-Xd1 **Sampling Point name:** Levin Xd1
Reception Date & Time: 08/04/2023 15:08
Analysis Start Date & Time: 08/04/2023 15:19 **Analysis Ending Date:** 24/04/2023
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.35	(± 0.11) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	<0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	40.0	(± 4.00) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	22	(± 6) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	57.6	(± 2.88) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	53.8	(± 1.1) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.109	(± 0.022) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.635	(± 0.127) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.004	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.64	mg/l	0.03
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002

		RESULTS	(UNCERTAINTY)	LOQ
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	203	(± 20) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.001	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

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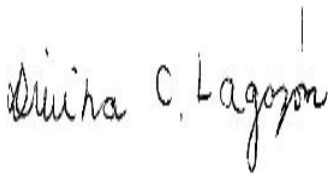
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.	NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.	NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.	NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Jennifer Mont Supervisor

Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

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Ganesh Ilancko Supervisor

Ivan Imamura Laboratory Analyst

Leo Cleave Senior Analyst Senior Analyst

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
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④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-032722-01** REPORT DATE **04/07/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
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Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00128113
Contract: Landfill

SAMPLE CODE **812-2023-00081953**

Client Reference: 301312-0
Product: Ground water
Sampling Point code: WIL-Xd1 **Sampling Point name:** Levin Xd1
Reception Date & Time: 16/06/2023 15:52
Analysis Start Date & Time: 16/06/2023 15:53 **Analysis Ending Date:** 04/07/2023
Sampled Date & Time 15/06/2023 11:37 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.41	(± 0.12) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<1	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	22	(± 6) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	57.3	(± 2.86) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	53.6	(± 1.1) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	<0.002	(± 0.001) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	<0.001	(± 0.0003) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	0.07	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	38.1	(± 3.81) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	0.076	(± 0.015) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	17.7	(± 1.77) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	0.579	(± 0.0579) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	<0.0005	(± 0.0002) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	6.31	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.103	(± 0.021) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	44.2	(± 4.42) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	<0.002	(± 0.0007) mg/l	0.002
ZMF1E	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<1	cfu/100 ml	1
NW010	**Nitrate-N**			
	Nitrate-N	<0.01	(± 0.003) mg/l	0.01
①NW195	**pH**			
	pH	7.7	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	<0.02	(± 0.01) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	16	mg/l	3
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0001	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	<0.0001	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	188	(± 19) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	168	(± 17) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	4.4	(± 0.4) mg/l	0.1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0005	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	NotRecovered	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5
	Iso caproic acid	<5	mg/l	5
	Isobutyric acid	<5	mg/l	5
	Isovaleric acid	<5	mg/l	5
	Propionic acid	<5	mg/l	5
	Valeric acid	<5	mg/l	5
	Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

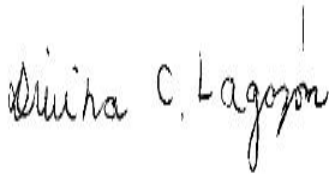
NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW011	**Sulphate:** APHA Online Edition 4110 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Dissolved Boron:** APHA Online Edition 3125 B mod.	NW098	**Dissolved Aluminium:** APHA Online Edition 3125 B mod.
NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.	NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.
NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.	NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.
NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.	NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.
NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.	NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.
NW195	**pH:** APHA Online Edition 4500-H B	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	VQ088	**Phenolics (Total):** APHA 5530
		ZMF1E	**Escherichia coli E (Water) [NZ] <1 >80 /100 ml (0) Ml Agar-F:** SMEWW 9222K; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor



Divina Cunanan Lagazon Supervisor

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Leo Cleave Senior Analyst Senior Analyst

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

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⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017885-01** REPORT DATE **18/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
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NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00117021
Contract: Landfill

SAMPLE CODE **812-2023-00049229**

Client Reference: 283046-0
Product: Ground water
Sampling Point code: WIL-Xs1 **Sampling Point name:** Levin Xs1
Reception Date & Time: 08/04/2023 15:10
Analysis Start Date & Time: 08/04/2023 15:19 **Analysis Ending Date:** 18/04/2023
Sampled Date & Time 06/04/2023 09:43 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	10.9	(± 1.09) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	<0.001	(± 0.0004) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	85.4	(± 8.54) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	87	(± 14) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	114	(± 5.68) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	142	(± 2.8) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.011	(± 0.003) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<4	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	1.10	(± 0.110) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.005	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.61	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	0.001	(± 0.0004) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	590	(± 59) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

		RESULTS	(UNCERTAINTY)	LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.001	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

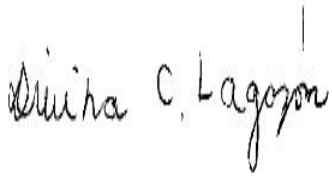
LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B	NW007	**Chloride:** APHA Online Edition 4110 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW023	**Conductivity:** APHA Online Edition 2510 B
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.	NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.	NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.	NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.	NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.	ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Jennifer Mont Supervisor

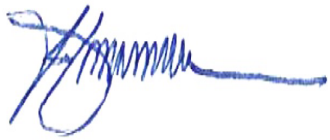
Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor



Ivan Imamura Laboratory Analyst

Leo Cleave Senior Analyst Senior Analyst

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

END OF REPORT

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE	AR-23-NW-032716-01	REPORT DATE	04/07/2023

Attention Downer NZ Ltd (EDI Levin)
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Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes
Contract: Landfill
Order code: EUNZWE-00127741

SAMPLE CODE 812-2023-00081008

Client Reference: 301313-0
Product: Ground water
Sampling Point code: WIL-Xs1
Sampling Point name: Levin Xs1
Reception Date & Time: 15/06/2023 15:00
Analysis Start Date & Time: 15/06/2023 15:03
Analysis Ending Date: 04/07/2023
Sampled Date & Time 13/06/2023 13:03
Sampler(s) Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	12.5	(± 1.25) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	1	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	78	(± 13) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	56.1	(± 2.80) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	92.1	(± 1.8) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.005	(± 0.001) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	<0.001	(± 0.0004) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	0.22	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	73.1	(± 7.31) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	<0.001	(± 0.0004) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	<0.0005	(± 0.0002) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	6.42	(± 0.642) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	26.6	(± 2.66) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	1.61	(± 0.161) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	0.0008	(± 0.0003) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	12.6	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.029	(± 0.006) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	52.3	(± 5.23) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	<0.002	(± 0.0007) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	<0.01	(± 0.003) mg/l	0.01
①NW195	**pH**			
	pH	6.7	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	6.04	(± 0.60) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	35	mg/l	3
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0001	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	<0.0001	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	373	(± 37) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	292	(± 29) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	31.6	(± 3.2) mg/l	0.1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0010	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012

		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	NotRecovered	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0005	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5
	Iso caproic acid	<5	mg/l	5
	Isobutyric acid	<5	mg/l	5
	Isovaleric acid	<5	mg/l	5
	Propionic acid	<5	mg/l	5
	Valeric acid	<5	mg/l	5
	Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

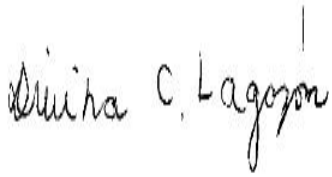
NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW011	**Sulphate:** APHA Online Edition 4110 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Dissolved Boron:** APHA Online Edition 3125 B mod.	NW098	**Dissolved Aluminium:** APHA Online Edition 3125 B mod.
NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.	NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.
NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.	NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.
NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.	NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.
NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.	NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.
NW195	**pH:** APHA Online Edition 4500-H B	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	VQ088	**Phenolics (Total):** APHA 5530
		ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor

Leo Cleave Senior Analyst Senior Analyst

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

EXPLANATORY NOTE

①Test is not accredited
②Test is subcontracted within Eurofins group and is accredited
③Test is subcontracted within Eurofins group and is not accredited
④Test is subcontracted outside Eurofins group and is accredited
⑤Test is subcontracted outside Eurofins group and is not accredited
⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

The test result(s) in this report apply only to the sample as received.
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END OF REPORT

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ANALYTICAL REPORT

REPORT CODE **AR-23-NW-017884-01** REPORT DATE **18/04/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
P O Box 642
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NEW ZEALAND

Phone (06) 367 2705
Email horowhenuaadmin@downer.co.nz

Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes **Order code:** EUNZWE-00117021
Contract: Landfill

SAMPLE CODE **812-2023-00049228**

Client Reference: 283047-0
Product: Ground water
Sampling Point code: WIL-Xs2 **Sampling Point name:** Levin Xs2
Reception Date & Time: 08/04/2023 15:09
Analysis Start Date & Time: 08/04/2023 15:19 **Analysis Ending Date:** 18/04/2023
Sampled Date & Time 06/04/2023 09:43 **Sampler(s)** Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.03	(± 0.009) mg/l	0.01
NW583	**Arsenic - Soluble**			
	Arsenic (As)	<0.001	(± 0.0003) mg/l	0.001
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<3	mg/l	1
NW457	**Calcium - Dissolved**			
	Calcium (Ca)	10.9	(± 1.09) mg/l	0.01
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	<15	(± 5) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	18.9	(± 0.95) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	19.9	(± 0.4) mS/m	0.1
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.011	(± 0.003) mg/l	0.005
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<4	cfu/100 ml	100
NW460	**Iron - Dissolved**			
	Iron (Fe)	0.132	(± 0.026) mg/l	0.005
NW098	**Soluble Aluminium**			
	Aluminium	0.007	(± 0.001) mg/l	0.002
NW103	**Soluble Boron**			
	Boron (B)	0.06	mg/l	0.03
NW104	**Soluble Cadmium**			

		RESULTS	(UNCERTAINTY)	LOQ
NW104	**Soluble Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW106	**Soluble Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Soluble Copper**			
	Copper (Cu)	0.0014	(± 0.0003) mg/l	0.0005
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0010	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	NotRecovered	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	48	(± 5) mg CaCO3/l	1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005

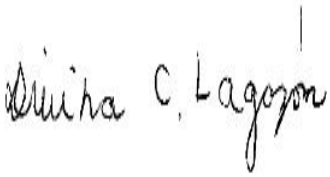
		RESULTS (UNCERTAINTY)		LOQ
NW229	**VOC (GC-MS)**			
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0050	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	<0.001	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.001	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005

LIST OF METHODS

NW003	**Total Alkalinity:** APHA Online Edition 2320 B
NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D
NW098	**Soluble Aluminium:** APHA Online Edition 3125 B mod.
NW104	**Soluble Cadmium:** APHA Online Edition 3125 B mod.
NW108	**Soluble Copper:** APHA Online Edition 3125 B mod.
NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS
NW457	**Calcium - Dissolved:** APHA Online Edition 3120 B mod.
NW583	**Arsenic - Soluble:** APHA Online Edition 3125 B mod.
NW007	**Chloride:** APHA Online Edition 4110 B
NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Soluble Boron:** APHA Online Edition 3125 B mod.
NW106	**Soluble Chromium:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H
NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW460	**Iron - Dissolved:** APHA Online Edition 3120 B mod.
ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

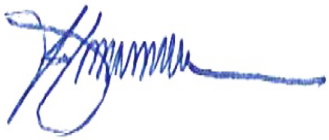
Amitesh Kumar Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor



Ivan Imamura Laboratory Analyst

Leo Cleave Senior Analyst Senior Analyst

EXPLANATORY NOTE

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②Test is subcontracted within Eurofins group and is accredited
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⑥Test result is provided by the customer and is not accredited
⑦Tested at the sampling point by Eurofins and is not accredited
⑧Tested at the sampling point by Eurofins and is accredited

N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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END OF REPORT

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Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-23-NW-032721-01** REPORT DATE **04/07/2023**

Attention Downer NZ Ltd (EDI Levin)
Horowhenua Admin
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4741 Levin
NEW ZEALAND

Phone (06) 367 2705
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Copy to: Water and Waste Team (waterandwasteteam@horowhenua.govt.nz), McMillan

Contact for your orders: Gabriela Carvalhaes
Contract: Landfill
Order code: EUNZWE-00128113

SAMPLE CODE **812-2023-00081948**

Client Reference: 301314-0
Product: Ground water
Sampling Point code: WIL-Xs2
Sampling Point name: Levin Xs2
Reception Date & Time: 16/06/2023 15:40
Analysis Start Date & Time: 16/06/2023 15:43
Analysis Ending Date: 04/07/2023
Sampled Date & Time 13/06/2023 13:04
Sampler(s) Client nominated external sampler
Sampled by Eurofins No

		RESULTS	(UNCERTAINTY)	LOQ
NW179	**Ammonia Nitrogen**			
	Ammoniacal nitrogen (N)	0.02	(± 0.006) mg/l	0.01
NW341	**BOD5 - Soluble Carbonaceous**			
	BOD5	<1	mg/l	1
NW020	**Chemical Oxygen Demand**			
	Chemical oxygen demand (COD)	<15	(± 5) mg/l	15
NW007	**Chloride**			
	Chloride (Cl)	14.9	(± 0.75) mg/l	0.02
NW023	**Conductivity**			
	Conductivity	20.2	(± 0.4) mS/m	0.1
NW098	**Dissolved Aluminium**			
	Aluminium	0.013	(± 0.001) mg/l	0.002
NW583	**Dissolved Arsenic**			
	Arsenic (As)	<0.001	(± 0.0003) mg/l	0.001
NW103	**Dissolved Boron**			
	Boron (B)	0.04	mg/l	0.03
NW104	**Dissolved Cadmium**			
	Cadmium (Cd)	<0.0002	(± 0.0001) mg/l	0.0002
NW457	**Dissolved Calcium**			
	Calcium (Ca)	13.1	(± 1.31) mg/l	0.01
NW106	**Dissolved Chromium**			
	Chromium (Cr)	<0.001	(± 0.0003) mg/l	0.001
NW108	**Dissolved Copper**			
	Copper (Cu)	0.0008	(± 0.0002) mg/l	0.0005
NW460	**Dissolved Iron**			

		RESULTS	(UNCERTAINTY)	LOQ
NW460	**Dissolved Iron**			
	Iron (Fe)	0.041	(± 0.008) mg/l	0.005
NW110	**Dissolved Lead**			
	Lead (Pb)	<0.0005	(± 0.0002) mg/l	0.0005
NW462	**Dissolved Magnesium**			
	Magnesium (Mg)	6.74	(± 0.67) mg/l	0.01
NW113	**Dissolved Manganese**			
	Manganese (Mn)	0.0414	(± 0.0083) mg/l	0.0005
NW114	**Dissolved Mercury**			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW116	**Dissolved Nickel**			
	Nickel (Ni)	<0.0005	(± 0.0002) mg/l	0.0005
NW117	**Dissolved Potassium**			
	Potassium (K)	4.80	mg/l	0.01
NW193	**Dissolved Reactive Phosphorus**			
	Phosphorus (soluble reactive)	0.016	(± 0.004) mg/l	0.005
NW469	**Dissolved Sodium**			
	Sodium (Na)	14.1	(± 1.41) mg/l	0.02
NW125	**Dissolved Zinc**			
	Zinc (Zn)	<0.002	(± 0.0007) mg/l	0.002
ZM2GA	**Enumeration of Escherichia coli By Membrane Filtration**			
	Escherichia coli	<100	cfu/100 ml	100
NW010	**Nitrate-N**			
	Nitrate-N	0.82	(± 0.21) mg/l	0.01
①NW195	**pH**			
	pH	6.7	(± 0.2)	0.1
③VQ088	**Phenolics (Total)**			
	Total phenols	<0.05	mg/l	0.05
NW011	**Sulphate**			
	Sulphate	11.9	(± 0.60) mg/l	0.02
NW206	**Suspended Solids**			
	Suspended Solids	21	mg/l	3
NW228	**SVOC (GC-MSMS)**			
	Acenaphthene	<0.0001	mg/l	0.0001
	Acenaphthylene	<0.001	mg/l	0.001
	Adipatic acid, bis-2-ethylhexyl ester (DEHA)	<0.0001	mg/l	0.0001
	Alachlor	<0.0001	mg/l	0.0001
	Aldicarb	<0.1	mg/l	0.1
	Aldrin	<0.001	mg/l	0.001
	Anthracene	<0.001	mg/l	0.001
	Atrazine	<0.0001	mg/l	0.0001
	Benz(a)anthracene	<0.0001	mg/l	0.0001
	Benzo(a)pyrene	<0.0001	mg/l	0.0001
	Benzo(g,h,i)perylene	<0.001	mg/l	0.001

		RESULTS (UNCERTAINTY)		LOQ
NW228	**SVOC (GC-MSMS)**			
	Bromacil	<0.005	mg/l	0.005
	Carbofuran	<0.001	mg/l	0.001
	Chlordane	<0.0001	mg/l	0.0001
	Chlordane, gamma	<0.001	mg/l	0.001
	Chlorpyrifos (-ethyl)	<0.0001	mg/l	0.0001
	Chrysene	<0.0001	mg/l	0.0001
	Cyanazine	<0.005	mg/l	0.005
	d-BHC	<0.0001	mg/l	0.0001
	DDD, p,p'-	<0.0001	mg/l	0.0001
	DDE, p,p-	<0.0001	mg/l	0.0001
	DDT, p,p'-	<0.001	mg/l	0.001
	Diazinon	<0.0001	mg/l	0.0001
	Dibenz(a,h)anthracene	<0.0001	mg/l	0.0001
	Dieldrin	<0.0001	mg/l	0.0001
	Dimethoate	<0.001	mg/l	0.001
	Diuron	<0.001	mg/l	0.001
	Endosulfan, alpha-	<0.001	mg/l	0.001
	Endosulfan, beta-	<0.005	mg/l	0.005
	Endosulfan-sulfate	<0.0001	mg/l	0.0001
	Endrin	<0.0001	mg/l	0.0001
	Endrin ketone	<0.0001	mg/l	0.0001
	Endrin-aldehyde	<0.001	mg/l	0.01
	Fluoranthene	<0.0001	mg/l	0.0001
	Fluorene	<0.0001	mg/l	0.0001
	HCH, alpha-	<0.0001	mg/l	0.0001
	HCH, beta-	<0.0001	mg/l	0.0001
	Heptachlor	<0.0001	mg/l	0.0001
	Heptachlor epoxide, cis-	<0.0001	mg/l	0.0001
	Hexachlorobenzene (HCB)	<0.0001	mg/l	0.0001
	Hexazinone	<0.001	mg/l	0.001
	Indeno(1,2,3-cd)pyrene	<0.0001	mg/l	0.0001
	Lindane (gamma-HCH)	<0.0001	mg/l	0.0001
	Metalaxyl	<0.001	mg/l	0.001
	Methoxychlor	<0.0001	mg/l	0.0001
	Metolachlor	<0.0001	mg/l	0.0001
	Metribuzin	<0.0001	mg/l	0.0001
	Molinate	<0.0001	mg/l	0.0001
	Naphthalene	<0.0001	mg/l	0.0001
	Oxadiazon	<0.0001	mg/l	0.0001
	PCB 101	<0.0001	mg/l	0.0001
	PCB 138	<0.001	mg/l	0.001
	PCB 183	<0.0001	mg/l	0.0001
	PCB 28	<0.0001	mg/l	0.0001
	PCB 7	<0.0001	mg/l	0.0001
	Pendimethalin	<0.002	mg/l	0.002
	Permethrin (sum of isomers)	<0.0001	mg/l	0.0001
	Phenanthrene	<0.0001	mg/l	0.0001
	Pirimiphos-methyl	<0.0001	mg/l	0.0001

		RESULTS	(UNCERTAINTY)	LOQ
NW228	**SVOC (GC-MSMS)**			
	Procymidone	<0.0001	mg/l	0.0001
	Propanil	<0.001	mg/l	0.001
	Propazine	<0.0001	mg/l	0.0001
	Pyrene	<0.0001	mg/l	0.0001
	Pyriproxyfen	<0.0001	mg/l	0.0001
	Simazine	<0.0001	mg/l	0.0001
	Terbuthylazine	<0.0001	mg/l	0.0001
	Total Benzo(b) and Benzo(k) fluoranthene	<0.001	mg/l	0.001
	Trifluralin	<0.0001	mg/l	0.0001
NW003	**Total Alkalinity**			
	Alkalinity total	60	(± 6) mg CaCO3/l	1
NW029	**Total Hardness**			
	Hardness	61	(± 6) mg CaCO3/l	1
NW210	**Total Non-Purgeable Organic Carbon**			
	Total Organic Carbon	1.8	(± 0.2) mg/l	0.1
NW229	**VOC (GC-MS)**			
	1,1,1,2-Tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,1-Trichloroethane	<0.0005	mg/l	0.0005
	1,1,2,2-tetrachloroethane	<0.0005	mg/l	0.0005
	1,1,2-Trichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethane	<0.0005	mg/l	0.0005
	1,1-Dichloroethene	<0.0005	mg/l	0.0005
	1,1-Dichloropropene	<0.0005	mg/l	0.0005
	1,2,3-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2,3-Trichloropropane	<0.0005	mg/l	0.0005
	1,2,4 trimethylbenzen	<0.0005	mg/l	0.0005
	1,2,4-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,2-Dibromo-3-chloropropane	<0.001	mg/l	0.002
	1,2-Dibromoethane	<0.0002	mg/l	0.0002
	1,2-Dichlorobenzene (2)	<0.0005	mg/l	0.0005
	1,2-Dichloroethane	<0.0005	mg/l	0.0005
	1,2-Dichloropropane	<0.0005	mg/l	0.0005
	1,3,5-Trichlorobenzene	<0.0005	mg/l	0.0005
	1,3,5-Trimethylbenzene	<0.0005	mg/l	0.0005
	1,3-Dichlorobenzene	<0.0005	mg/l	0.0005
	1,3-Dichloropropane	<0.0005	mg/l	0.0005
	1,4-dichlorobenzene	<0.0005	mg/l	0.0005
	2,2-Dichloropropane	<0.0005	mg/l	0.0005
	2-Chlorotoluene	<0.0005	mg/l	0.0005
	3-chloropropene	<0.0005	mg/l	0.0005
	4-Chlorotoluene	<0.0005	mg/l	0.0005
	4-methyl-2-pentanone	<0.0005	mg/l	0.0005
	Benzene	<0.0005	mg/l	0.0005
	Bromobenzene	<0.0005	mg/l	0.0005
	Bromochloromethane	<0.0012	mg/l	0.0012

		RESULTS	(UNCERTAINTY)	LOQ
NW229	**VOC (GC-MS)**			
	Bromodichloromethane	<0.0005	mg/l	0.0005
	Bromoform	<0.0005	mg/l	0.0005
	Bromomethane (zone 2)	<0.001	mg/l	0.001
	Carbon tetrachloride	<0.0005	mg/l	0.0005
	Carbondisulphide (CS2)	<0.0005	mg/l	0.0005
	Chlorobenzene	<0.0005	mg/l	0.0005
	Chloroethane	NotRecovered	mg/l	0.001
	Chloroform	<0.0005	mg/l	0.0005
	Chloromethane	<0.006	mg/l	0.006
	cis-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	cis-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Dibromochloromethane	<0.0005	mg/l	0.0005
	Dibromomethane	<0.0005	mg/l	0.0005
	Dichlorodifluoromethane	NotRecovered	mg/l	0.001
	Dichloromethane	<0.005	mg/l	0.005
	Hexachlorobutadiene	<0.0002	mg/l	0.0002
	Isopropylbenzene (Cumene)	<0.0005	mg/l	0.0005
	m,p-Xylene, Ethylbenzene	<0.0015	mg/l	0.0015
	Naphthalene	<0.0005	mg/l	0.0005
	n-Butylbenzene	<0.0005	mg/l	0.0005
	n-Propylbenzene	<0.0005	mg/l	0.0005
	p-Isopropyltoluene	<0.0005	mg/l	0.0005
	sec-Butylbenzene	<0.0010	mg/l	0.0005
	Styrene	<0.0005	mg/l	0.0005
	tert-Butylbenzene	<0.0005	mg/l	0.0005
	Tetrachloroethene	<0.0005	mg/l	0.0005
	Toluene	<0.0005	mg/l	0.0005
	trans-1,2-Dichloroethene	<0.0005	mg/l	0.0005
	trans-1,3-Dichloropropene	<0.0005	mg/l	0.0005
	Trichloroethene	<0.0005	mg/l	0.0005
	Trichlorofluoromethane	<0.0005	mg/l	0.0005
	Vinyl chloride	<0.0005	mg/l	0.0003
	Xylene (ortho-)	<0.0005	mg/l	0.0005
③VQ876	**Volatile Fatty Acids (VFA) by GC-MS**			
	Acetic acid	<5	mg/l	5
	Butyric acid	<5	mg/l	5
	Heptanoic Acid C7:0	<5	mg/l	5
	Hexanoic acid	<5	mg/l	5
	Iso caproic acid	<5	mg/l	5
	Isobutyric acid	<5	mg/l	5
	Isovaleric acid	<5	mg/l	5
	Propionic acid	<5	mg/l	5
	Valeric acid	<5	mg/l	5
	Volatile fatty acids as acetic acid	<5	mg/l	5

LIST OF METHODS

NW003 **Total Alkalinity:** APHA Online Edition 2320 B

NW007 **Chloride:** APHA Online Edition 4110 B

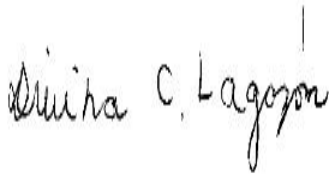
NW010 **Nitrate-N:** APHA Online Edition 4110 B

NW020	**Chemical Oxygen Demand:** APHA Online Edition 5220 D	NW011	**Sulphate:** APHA Online Edition 4110 B
NW029	**Total Hardness:** APHA Online Edition 2340 B	NW023	**Conductivity:** APHA Online Edition 2510 B
NW103	**Dissolved Boron:** APHA Online Edition 3125 B mod.	NW098	**Dissolved Aluminium:** APHA Online Edition 3125 B mod.
NW106	**Dissolved Chromium:** APHA Online Edition 3125 B mod.	NW104	**Dissolved Cadmium:** APHA Online Edition 3125 B mod.
NW110	**Dissolved Lead:** APHA Online Edition 3125 B mod.	NW108	**Dissolved Copper:** APHA Online Edition 3125 B mod.
NW114	**Dissolved Mercury:** APHA Online Edition 3125 B mod.	NW113	**Dissolved Manganese:** APHA Online Edition 3125 B mod.
NW117	**Dissolved Potassium:** APHA Online Edition 3125 B mod.	NW116	**Dissolved Nickel:** APHA Online Edition 3125 B mod.
NW179	**Ammonia Nitrogen:** APHA Online Edition 4500-NH3 H	NW125	**Dissolved Zinc:** APHA Online Edition 3125 B mod.
NW195	**pH:** APHA Online Edition 4500-H B	NW193	**Dissolved Reactive Phosphorus:** APHA Online Edition 4500-P G
NW210	**Total Non-Purgeable Organic Carbon:** APHA Online Edition 5310 B	NW206	**Suspended Solids:** APHA Online Edition 2540 D
NW229	**VOC (GC-MS):** Internal Method, HS-GC-MS	NW228	**SVOC (GC-MSMS):** Internal Method, GC-MS/MS
NW457	**Dissolved Calcium:** APHA Online Edition 3120 B mod.	NW341	**BOD5 - Soluble Carbonaceous:** APHA Online Edition 5210 B
NW462	**Dissolved Magnesium:** APHA Online Edition 3120 B mod.	NW460	**Dissolved Iron:** APHA Online Edition 3120 B mod.
NW583	**Dissolved Arsenic:** APHA Online Edition 3125 B mod.	NW469	**Dissolved Sodium:** APHA Online Edition 3120 B mod.
VQ876	**Volatile Fatty Acids (VFA) by GC-MS:** APHA 5560-D	VQ088	**Phenolics (Total):** APHA 5530
		ZM2GA	**Escherichia coli E (Water) [NZ] <100 >6 000 000 /100 ml (0-3) m-FC Agar-F:** SMEWW 9222I; APHA Online

Signature

Marylou Cabral Laboratory Manager

Jennifer Mont Supervisor



Divina Cunanan Lagazon Supervisor

Gordon McArthur Senior laboratory Analyst

Ganesh Ilancko Supervisor

Leo Cleave Senior Analyst Senior Analyst

Gabriela Carvalhaes Manager Food and Water Testing Chemistry

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N/A means Not Applicable
Not Detected means not detected at or above the Limit of Quantification (LOQ)
LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

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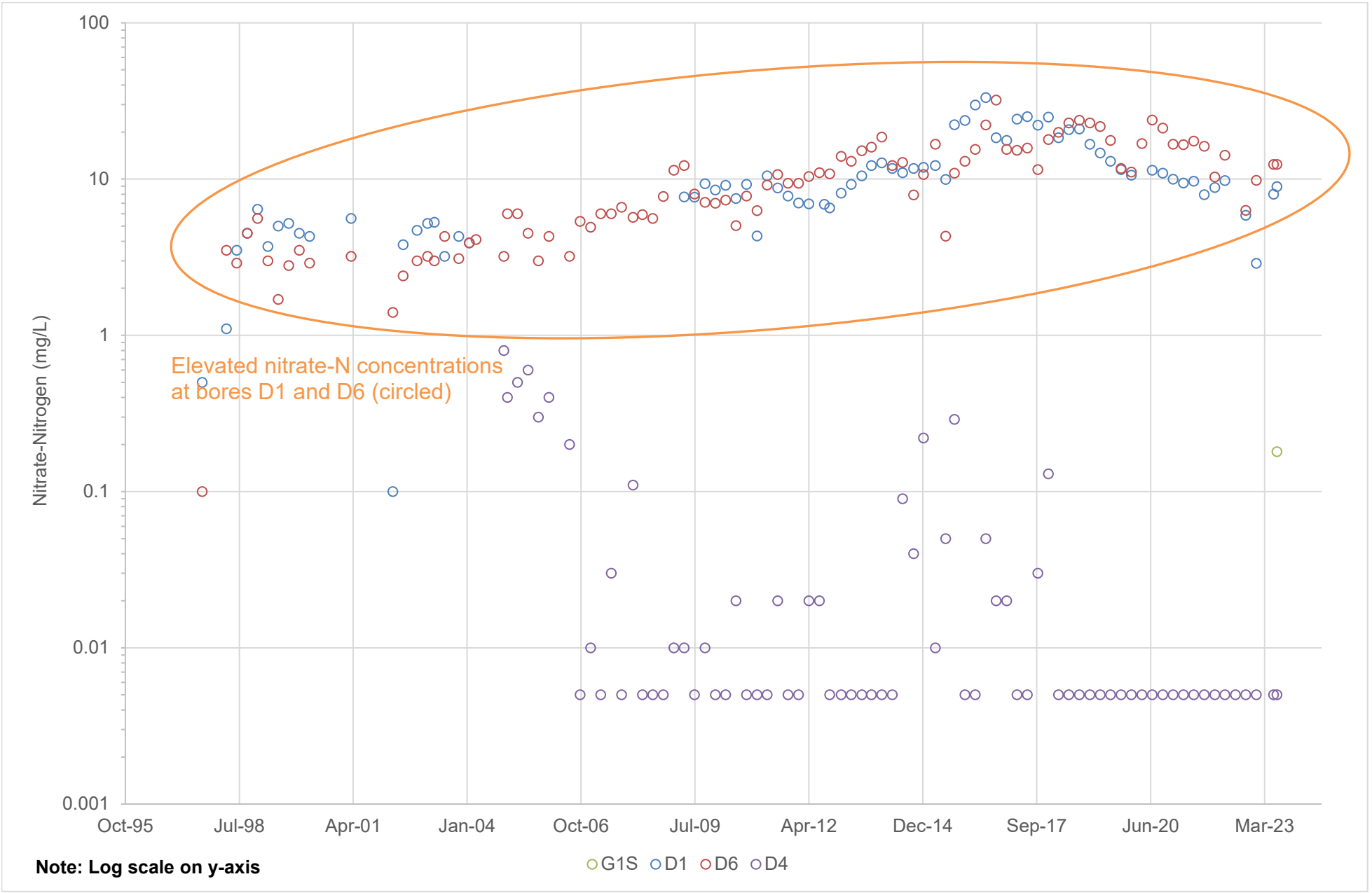
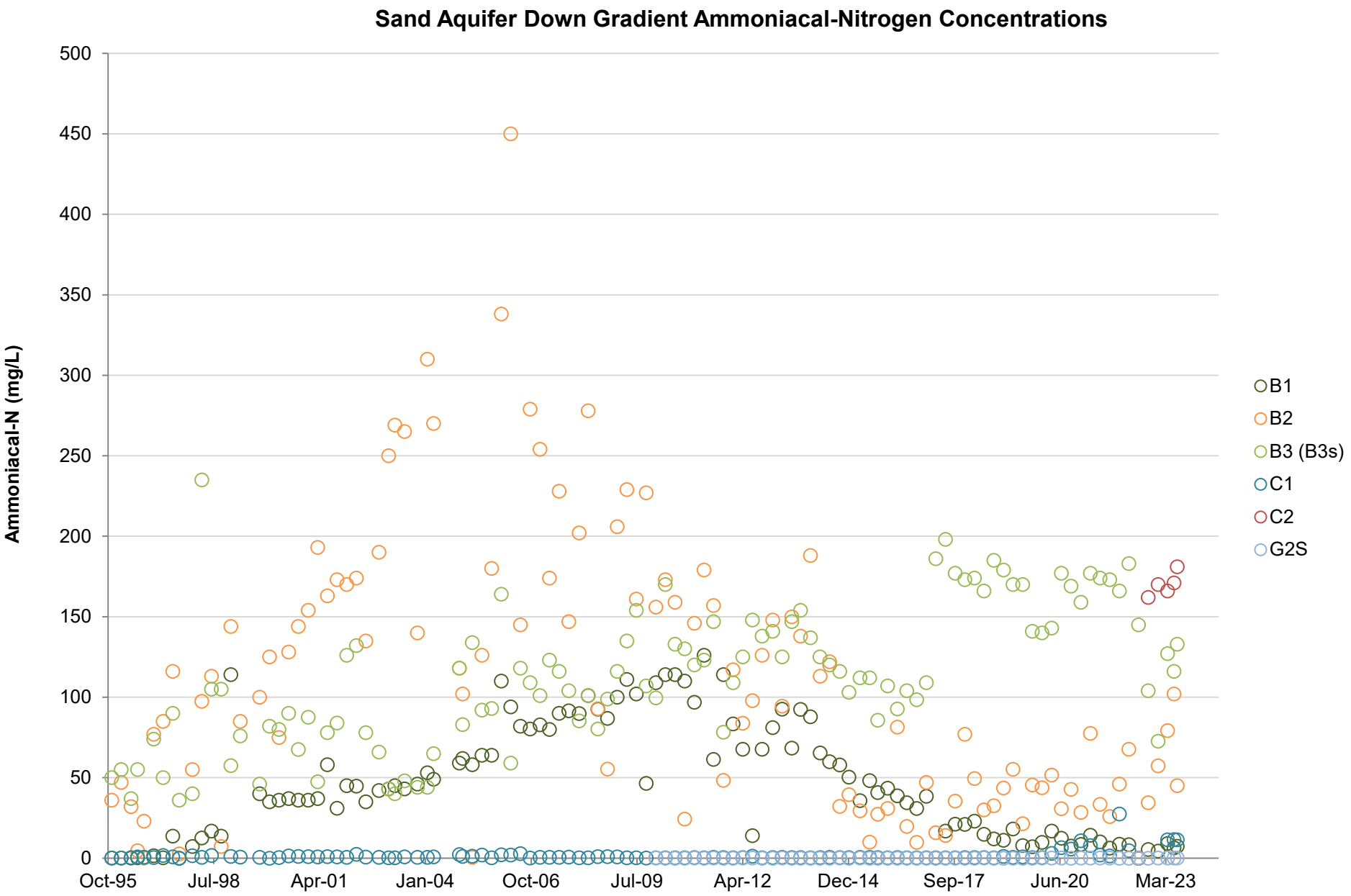
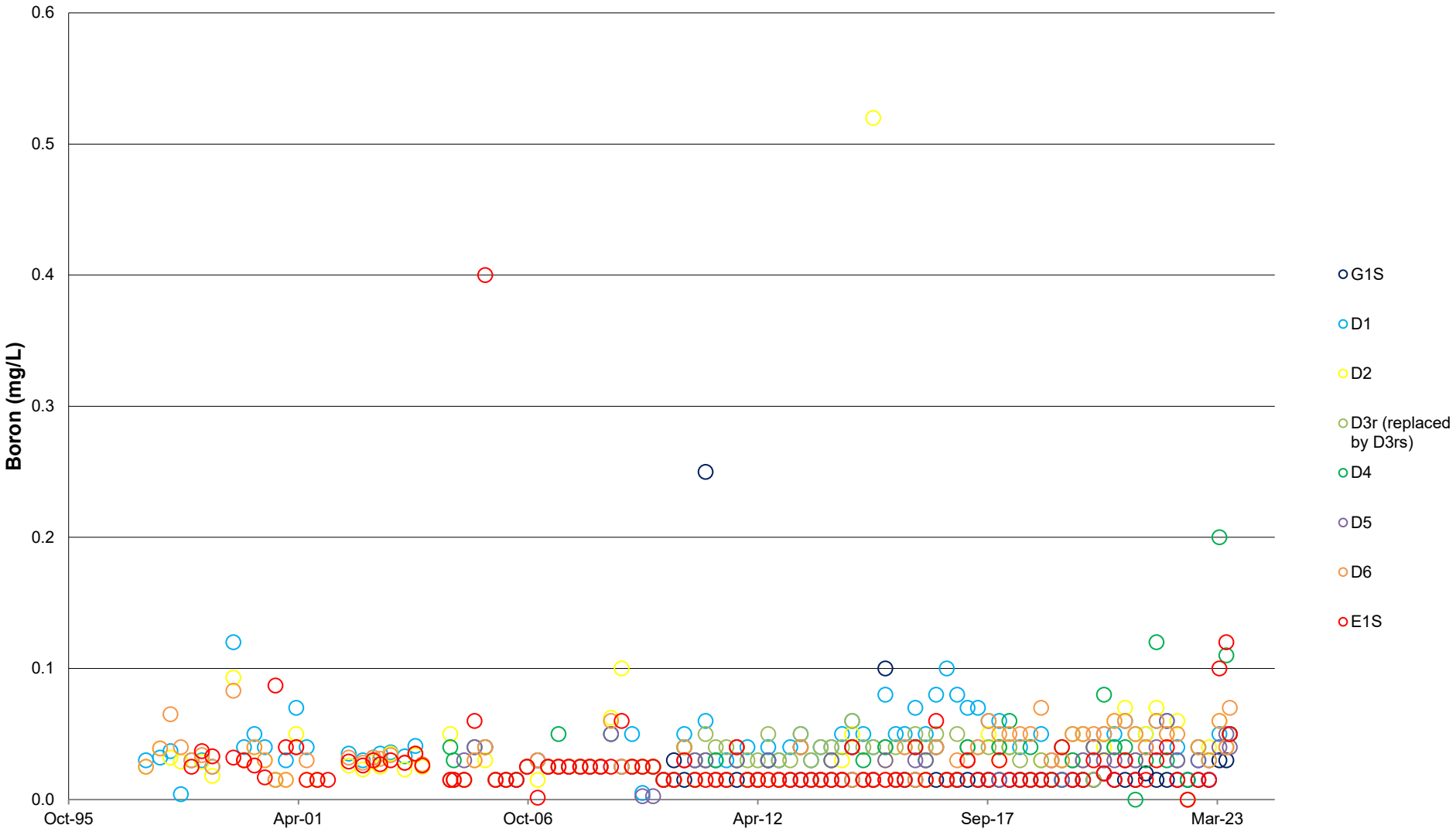
END OF REPORT

Appendix D Historical Results Graphs


100
10
1
0.1
0.01
0.001
Nitrate-Nitrogen (mg/L)
Elevated nitrate-N concentrations
at bores D1 and D6 (circled)
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
G1S
D1
D6
D4
Note: Log scale on y-axis

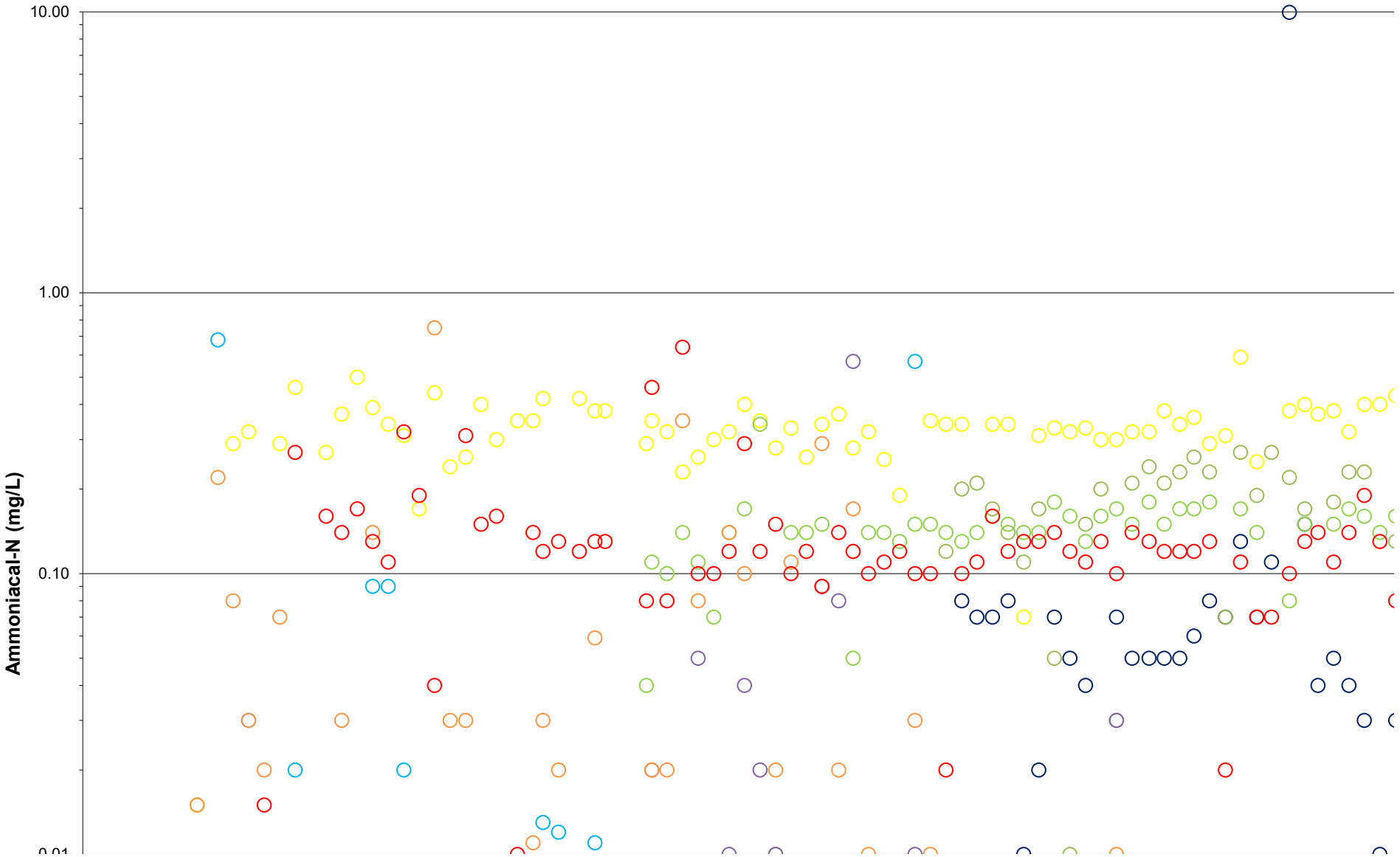

Sand Aquifer Down Gradient Ammoniacal-Nitrogen Concentrations
Ammoniacal-N (mg/L)
500
450
400
350
300
250
200
150
100
50
0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
B1
B2
B3 (B3s)
C1
C2
G2S

Sand Aquifer Downgradient of New Landfill - Boron Concentrations

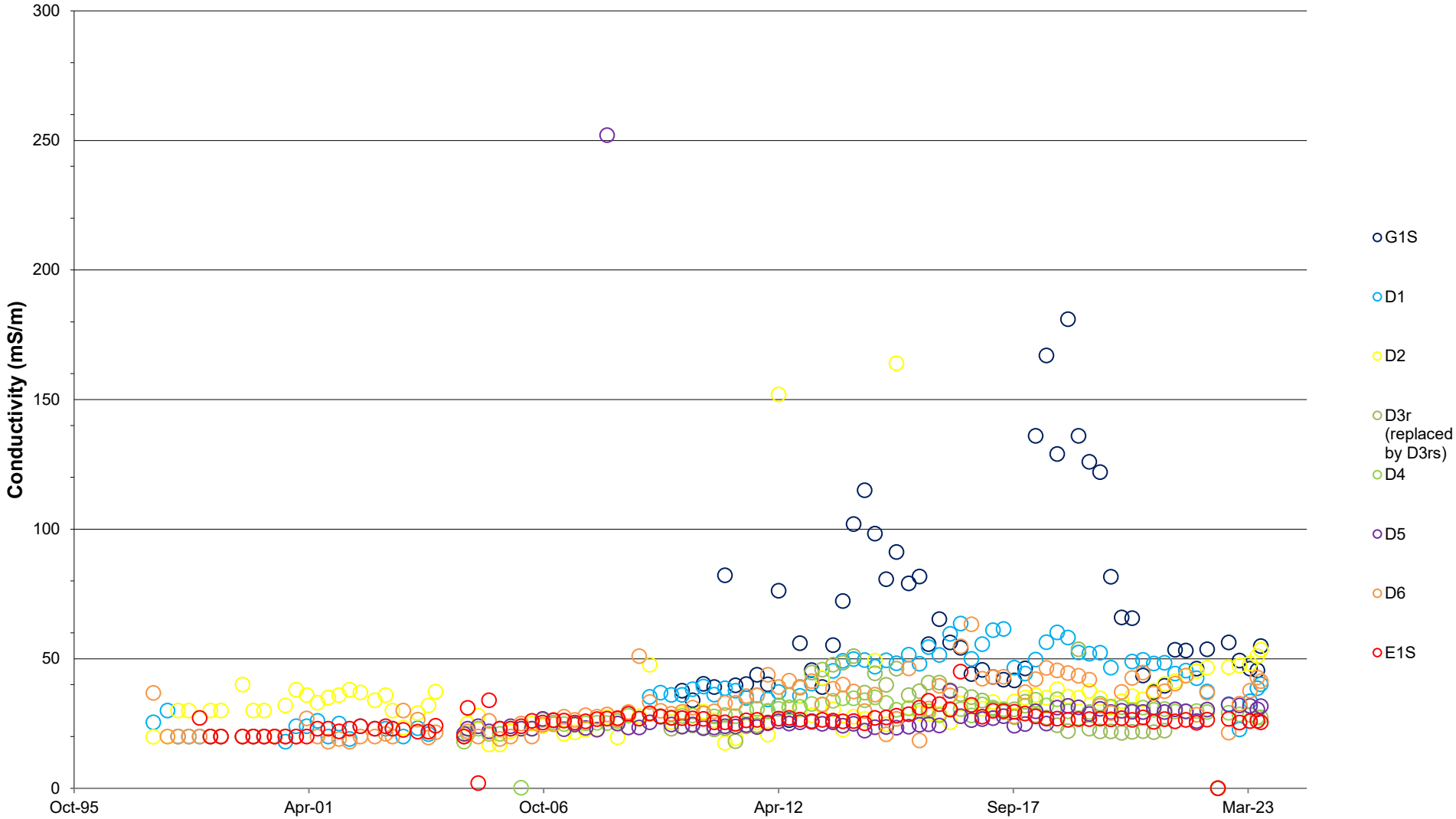


Sand Aquifer Downgradient of New Landfill - Chloride Concentrations

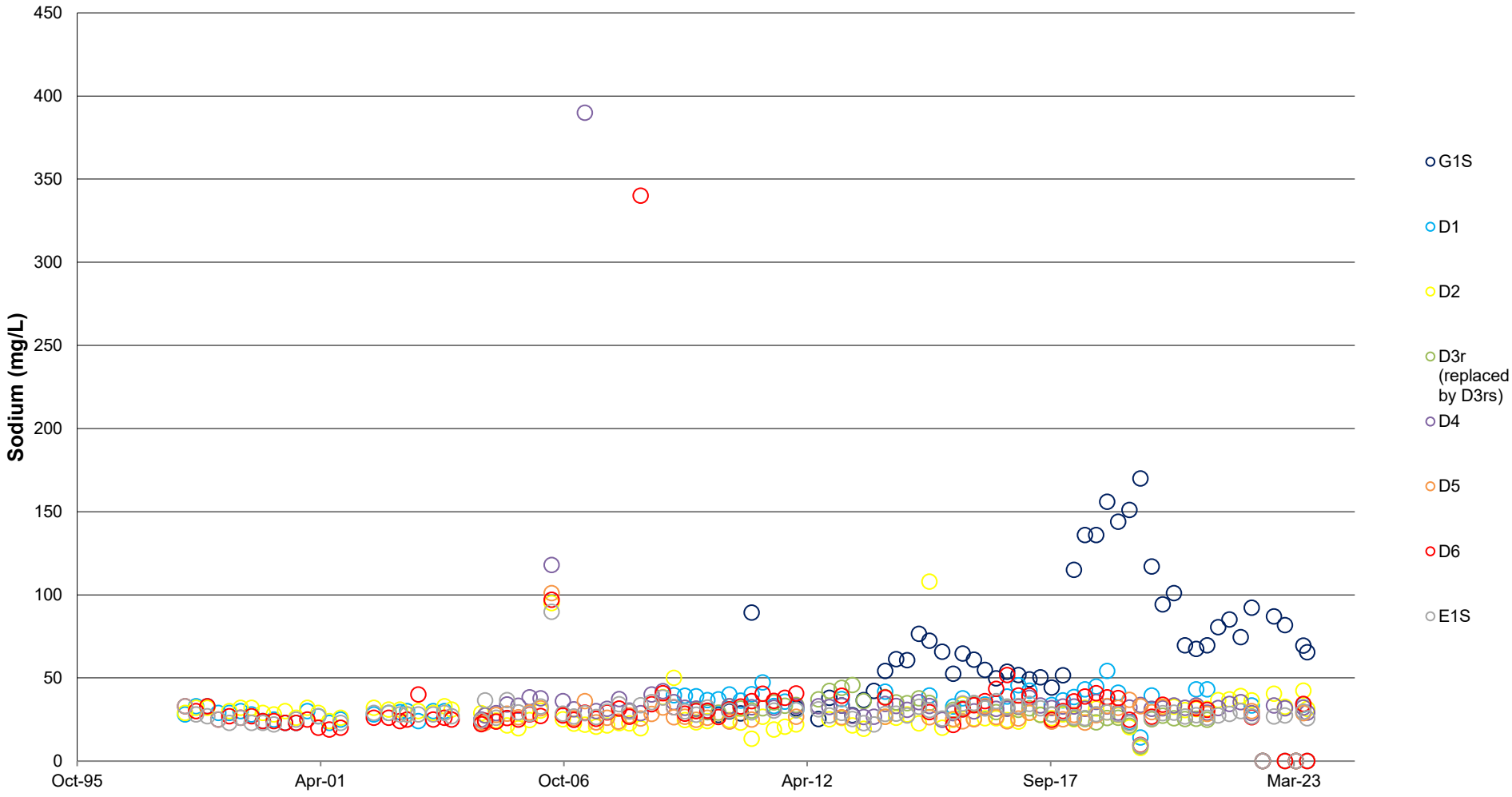
Sand Aquifer Downgradient of New Landfill - Ammoniacal-Nitrogen Concentrations
Note: Y-axis scale is Logarithmic

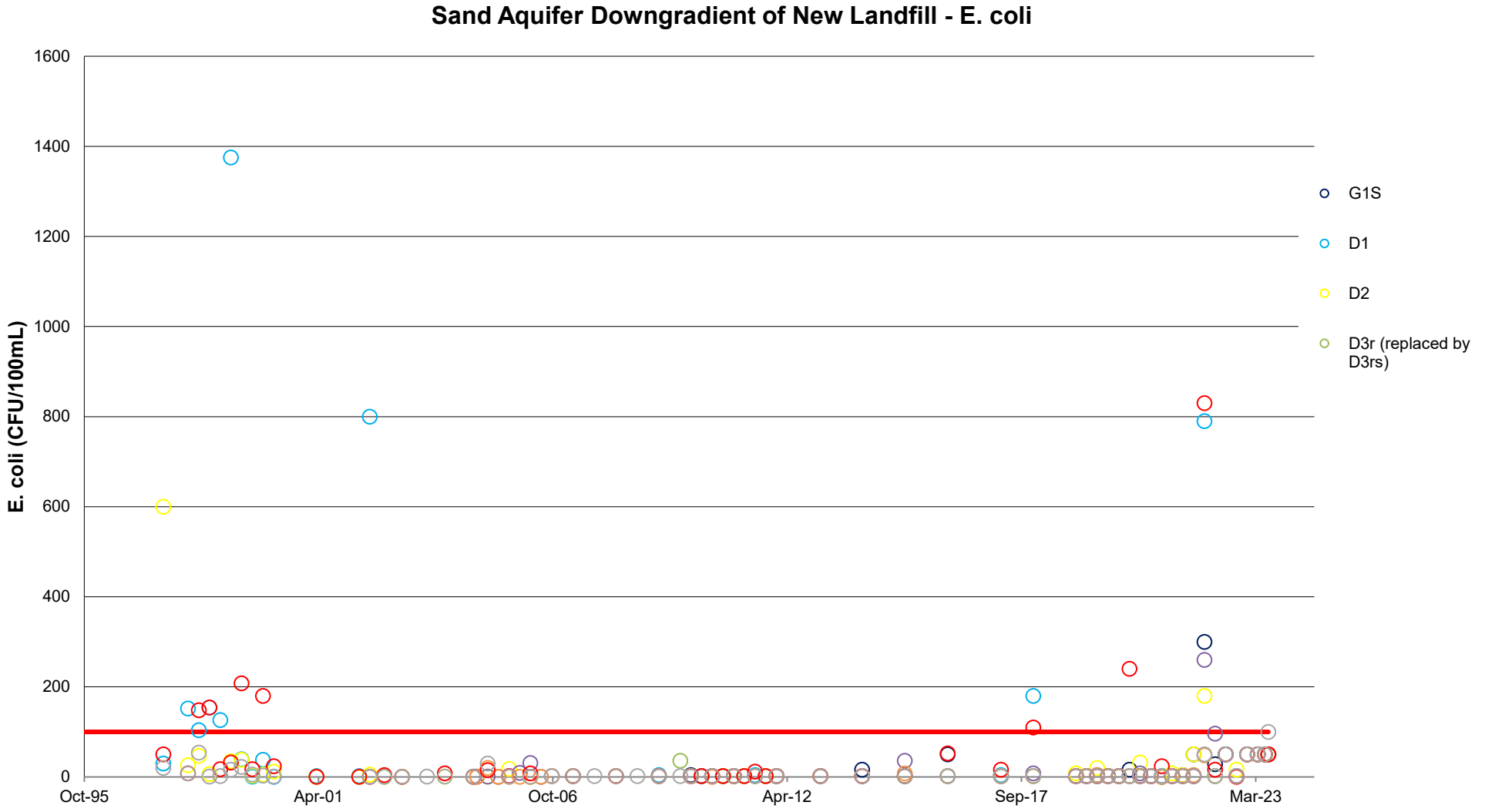


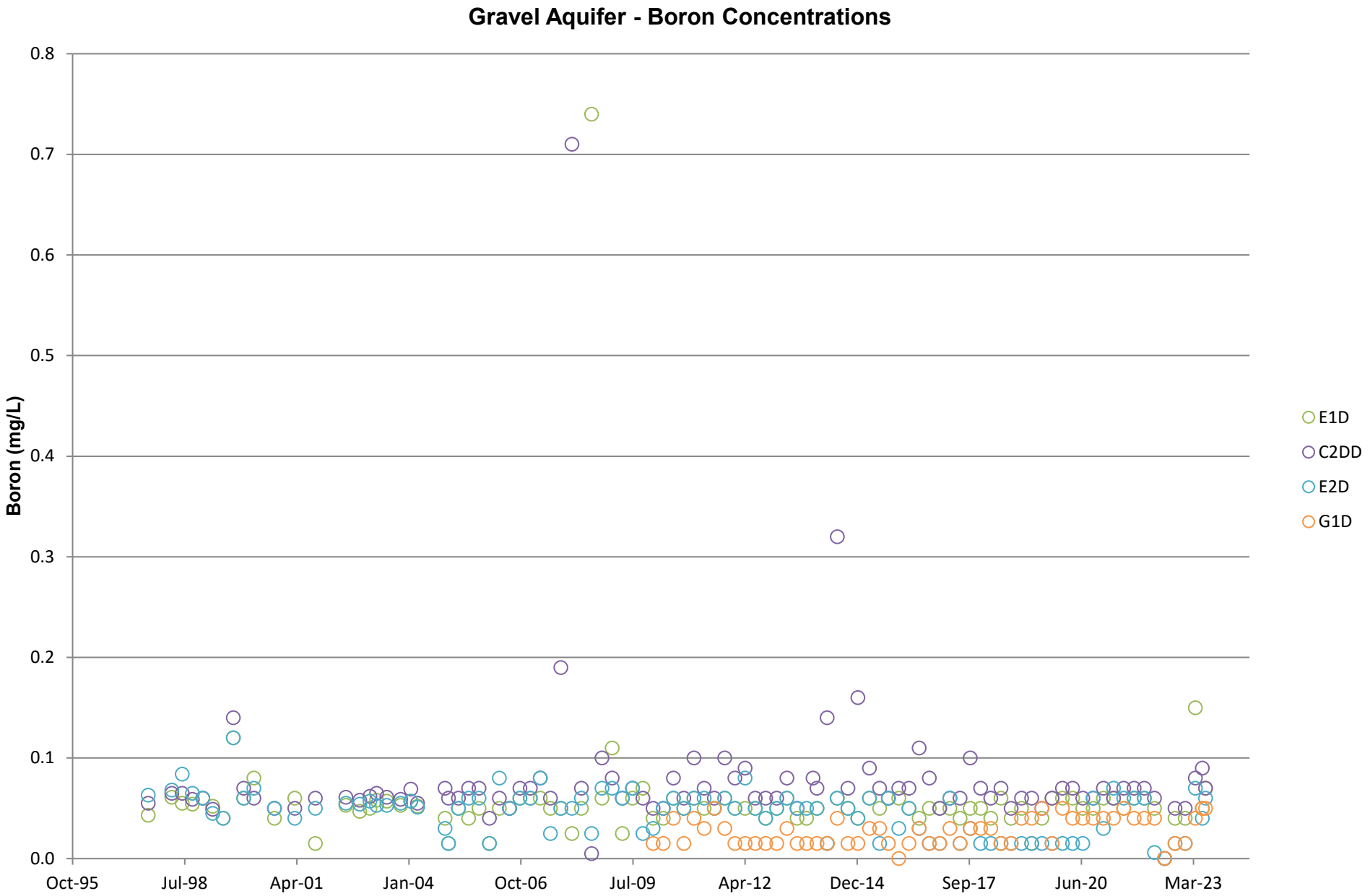
Sand Aquifer Downgradient of New Landfill - Conductivity Levels

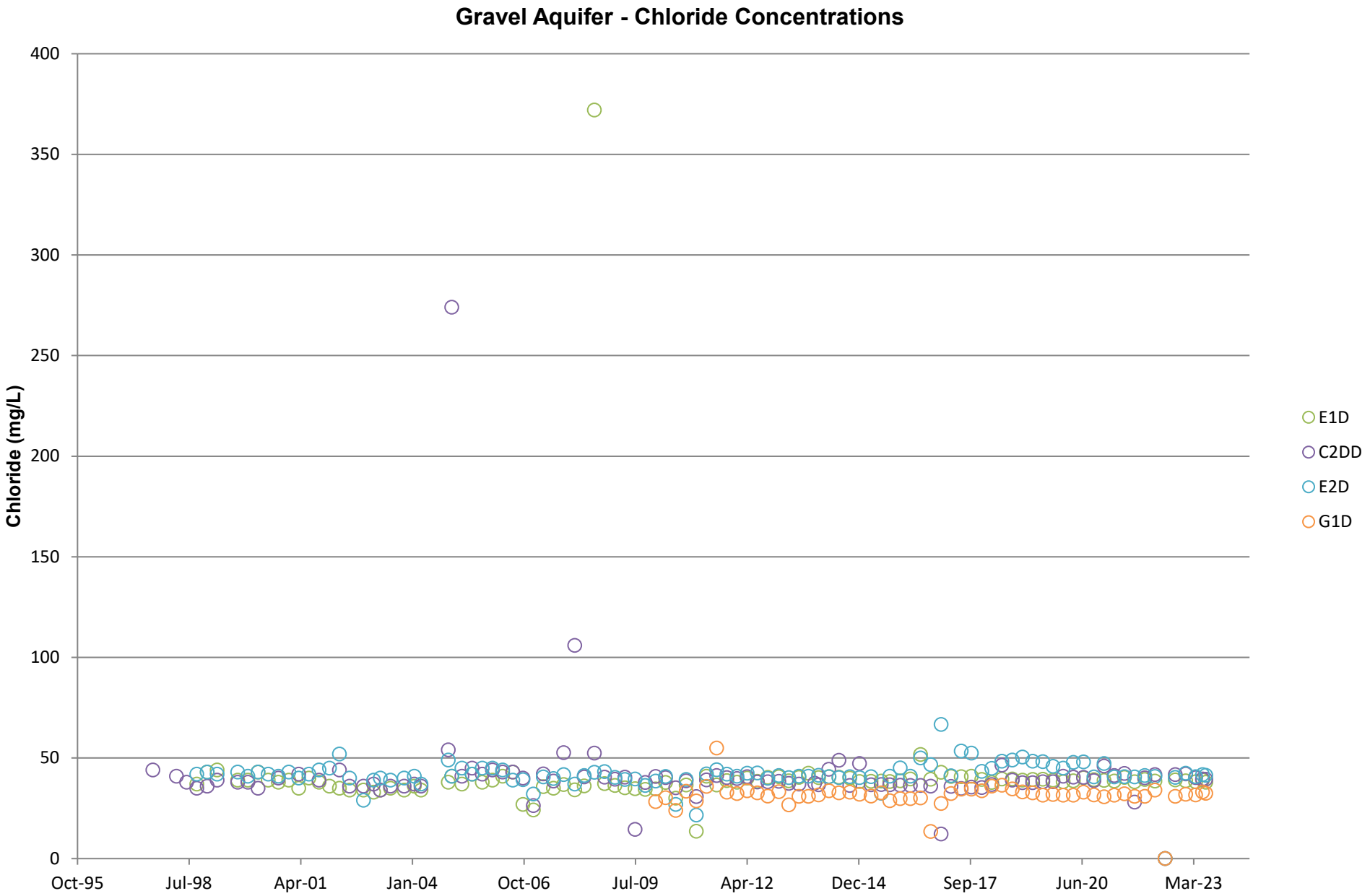


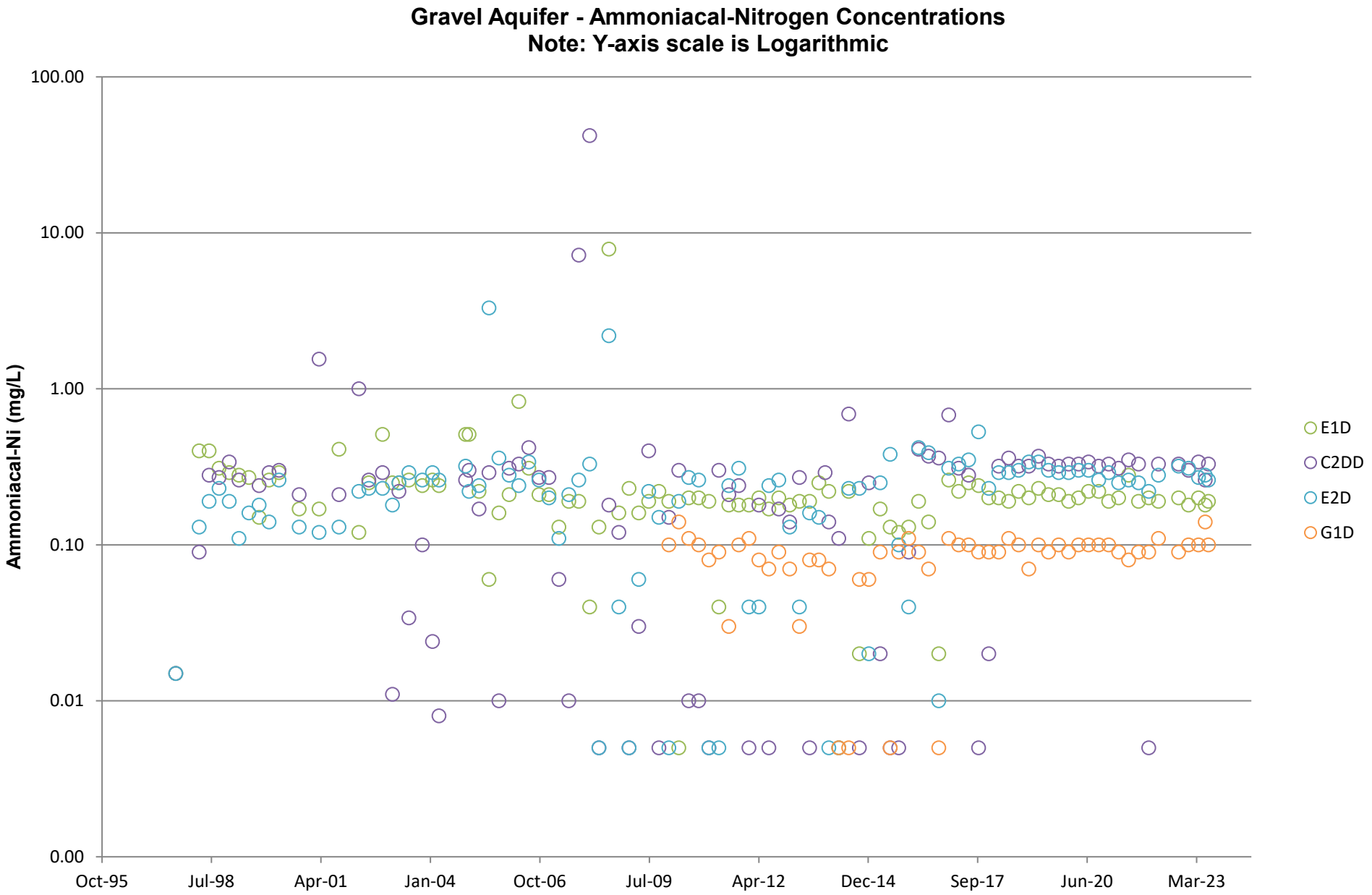
Sand Aquifer Downgradient of New Landfill - Sodium Concentrations

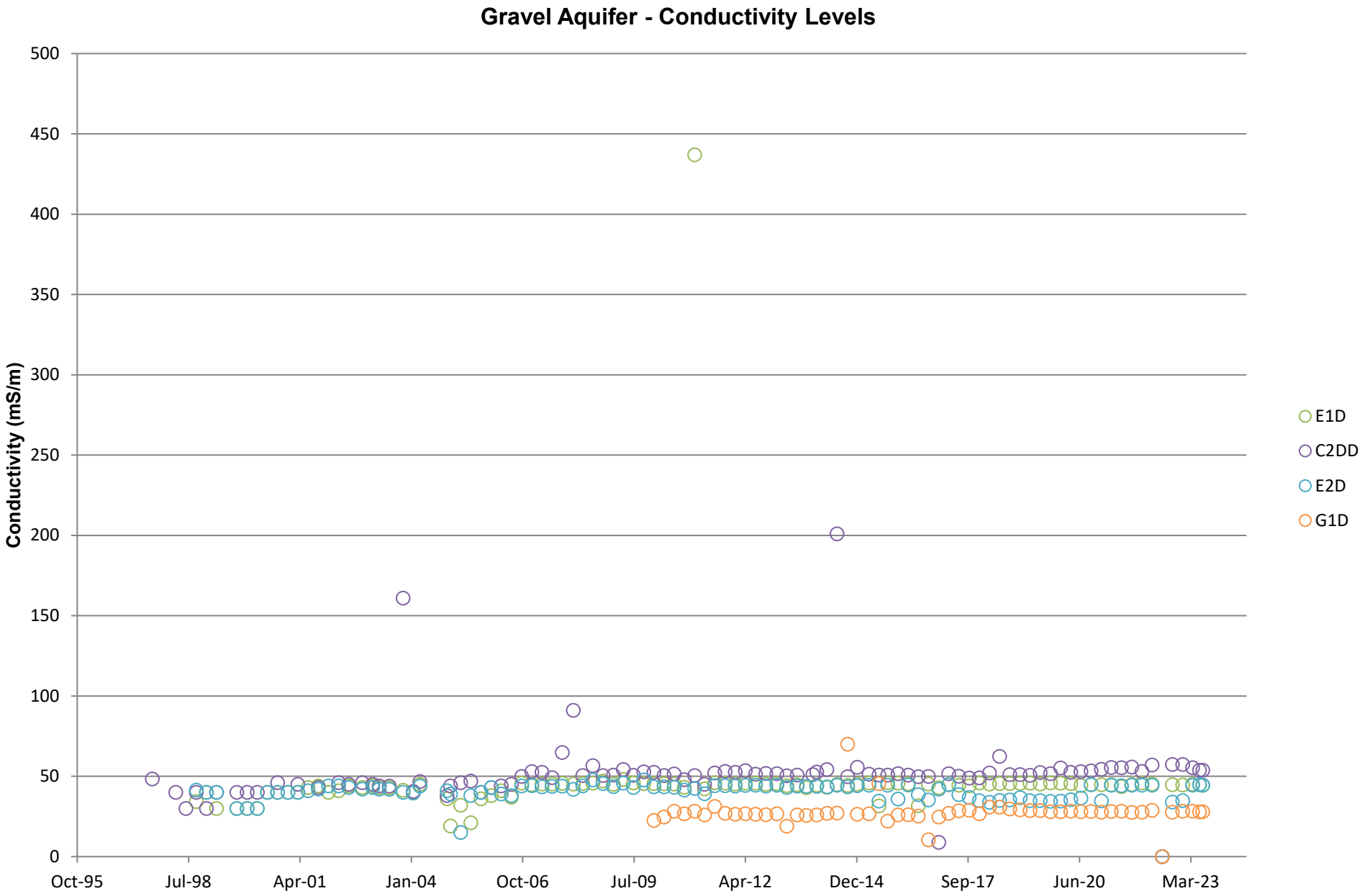


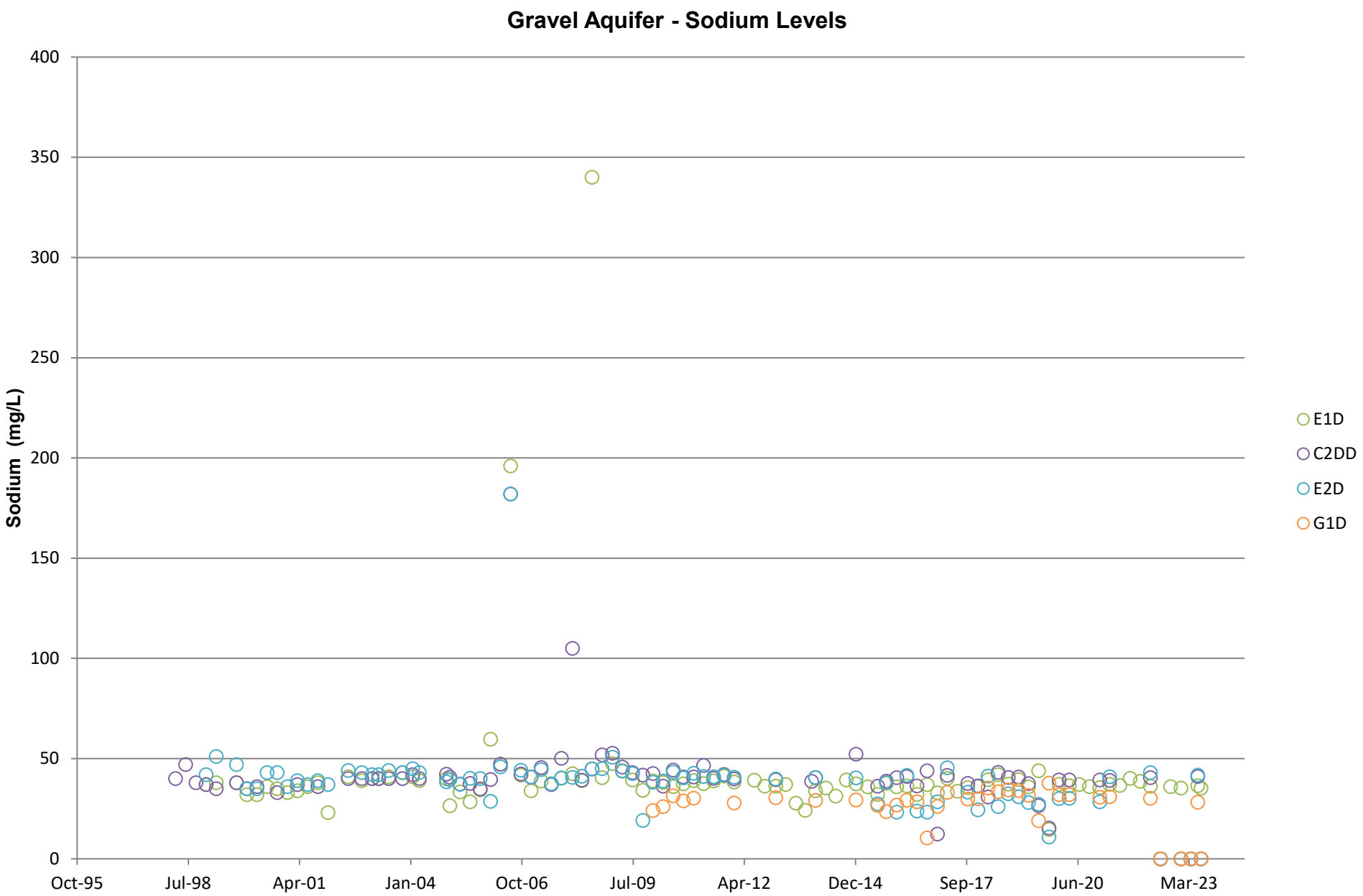

Sand Aquifer Downgradient of New Landfill - E. coli
E. coli (CFU/100mL)
1600
1400
1200
1000
800
600
400
200
0
Oct-95
Apr-01
Oct-06
Apr-12
Sep-17
Mar-23
G1S
D1
D2
D3r (replaced by D3rs)

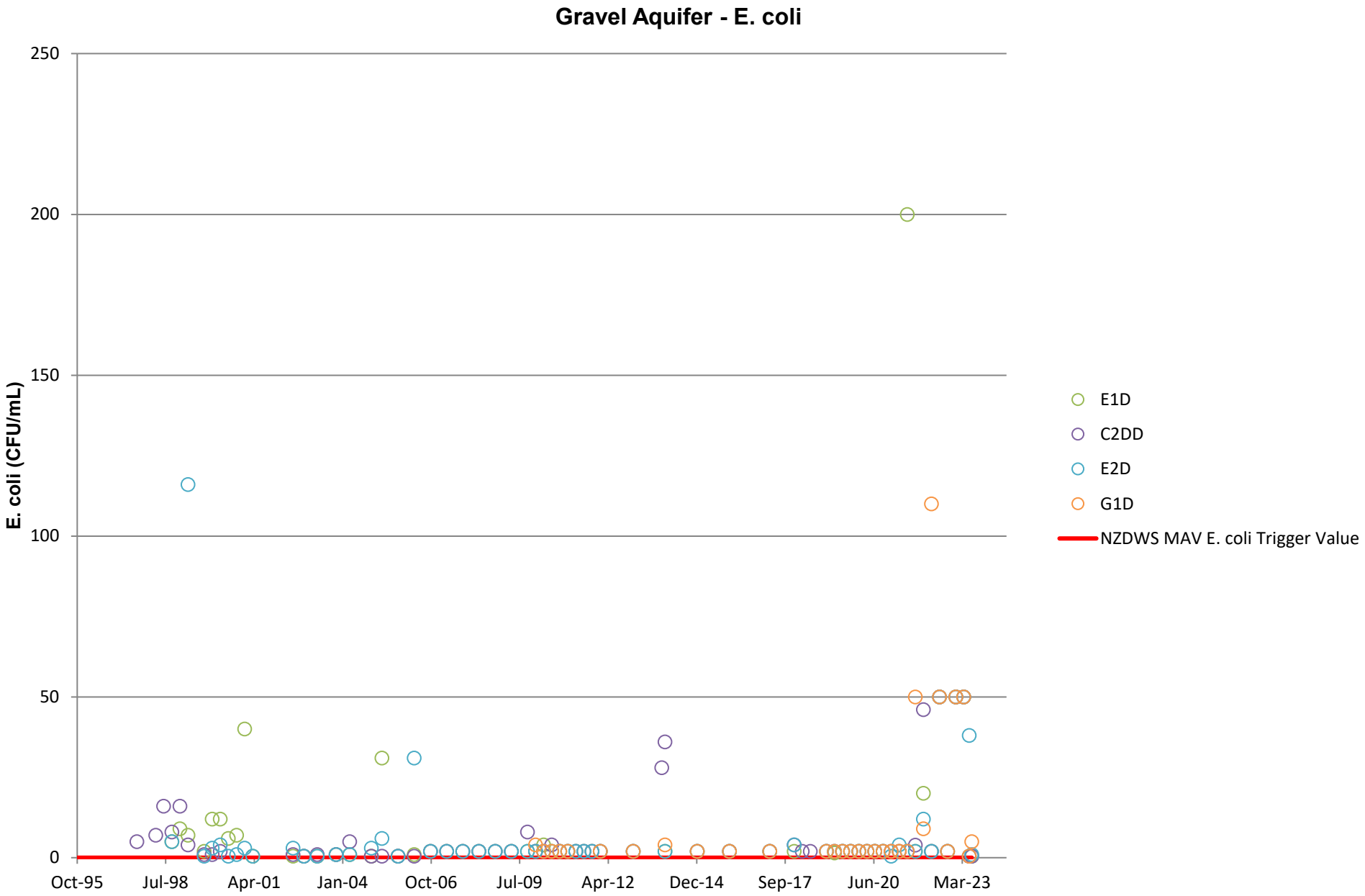

Gravel Aquifer - Boron Concentrations
Boron (mg/L)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
E1D
C2DD
E2D
G1D

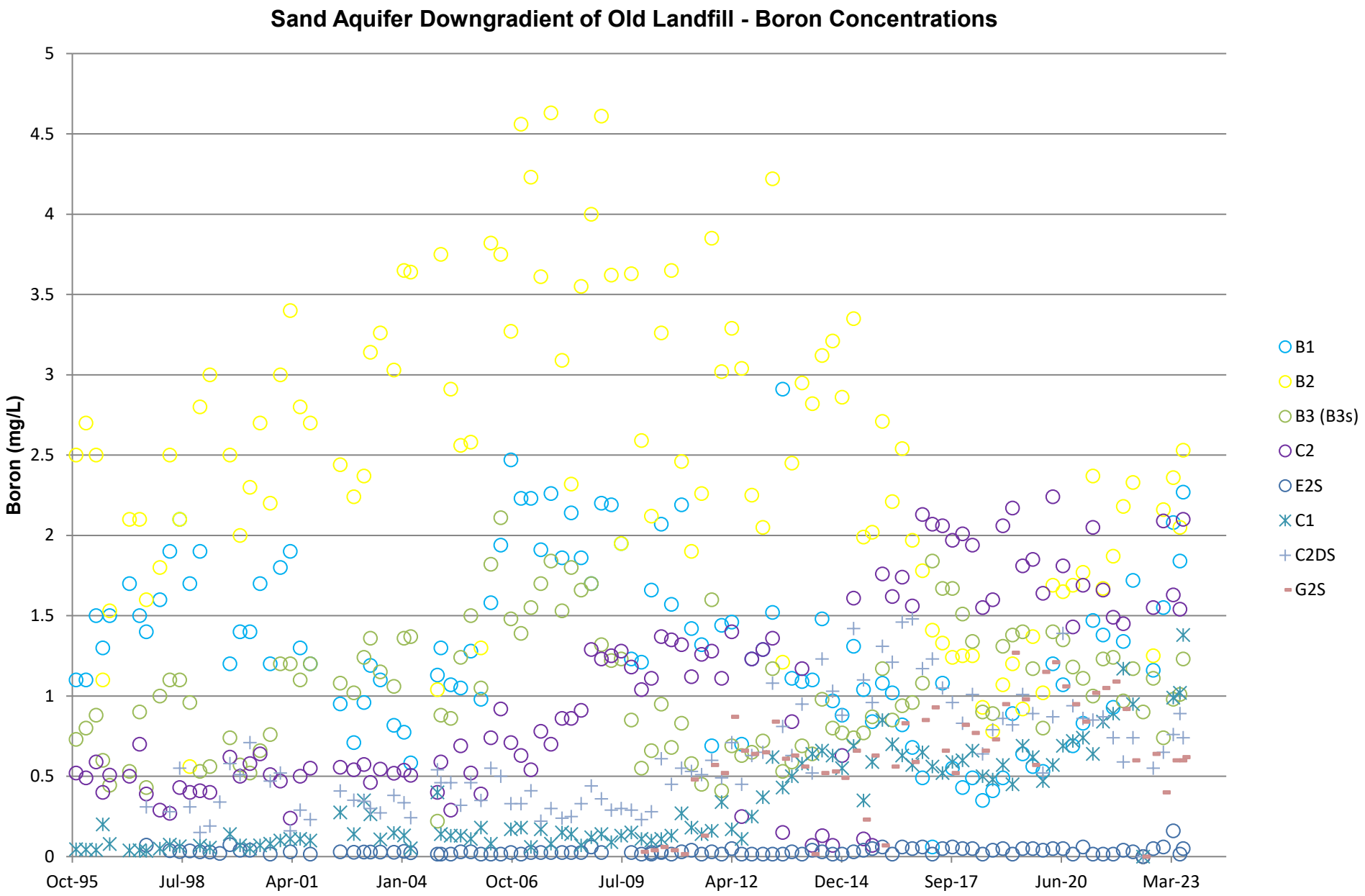

Gravel Aquifer - Chloride Concentrations
Chloride (mg/L)
400
350
300
250
200
150
100
50
0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
E1D
C2DD
E2D
G1D

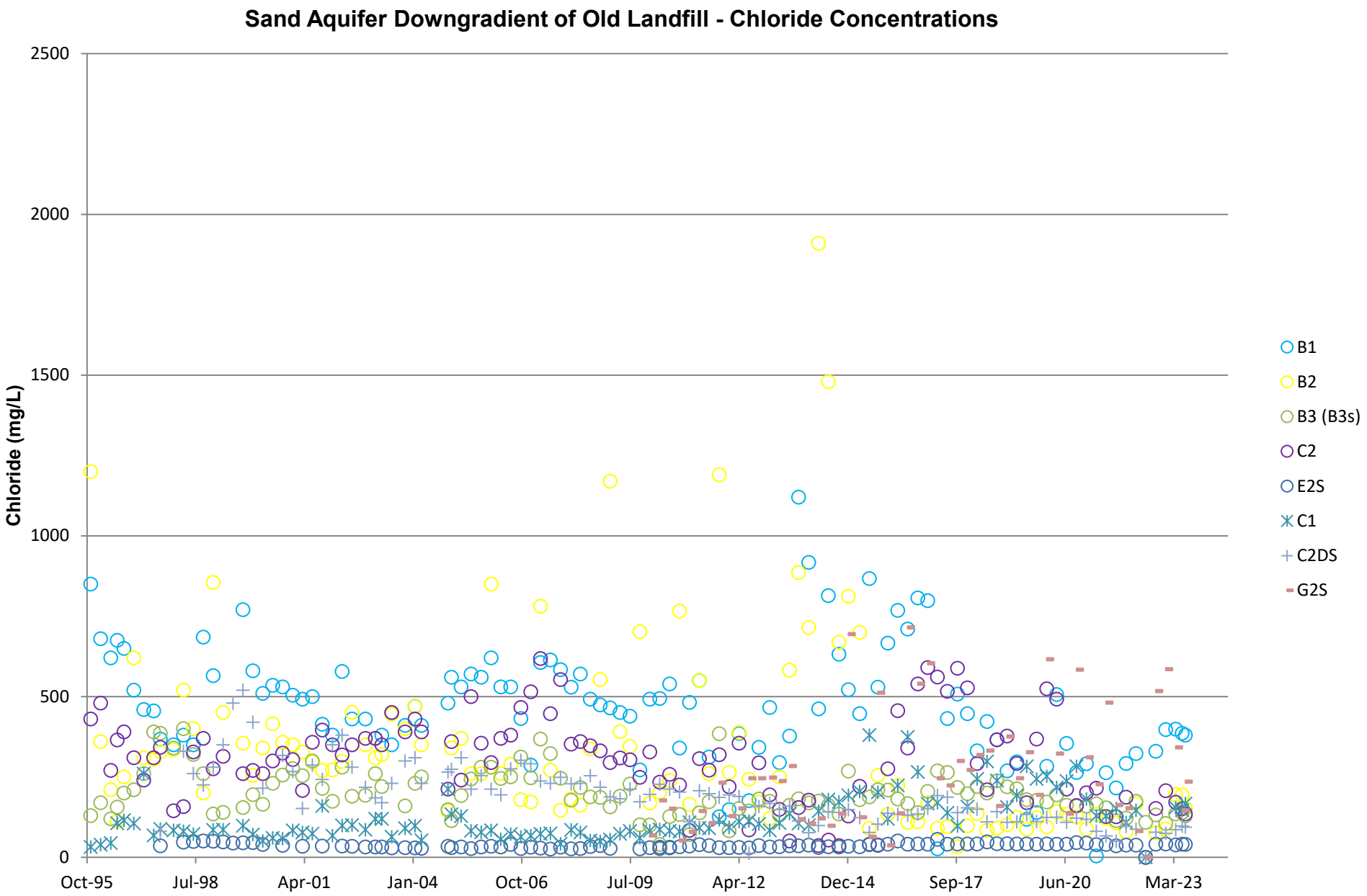

Gravel Aquifer - Ammoniacal-Nitrogen Concentrations
Note: Y-axis scale is Logarithmic
Ammoniacal-Ni (mg/L)
100.00
10.00
1.00
0.10
0.01
0.00
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
E1D
C2DD
E2D
G1D

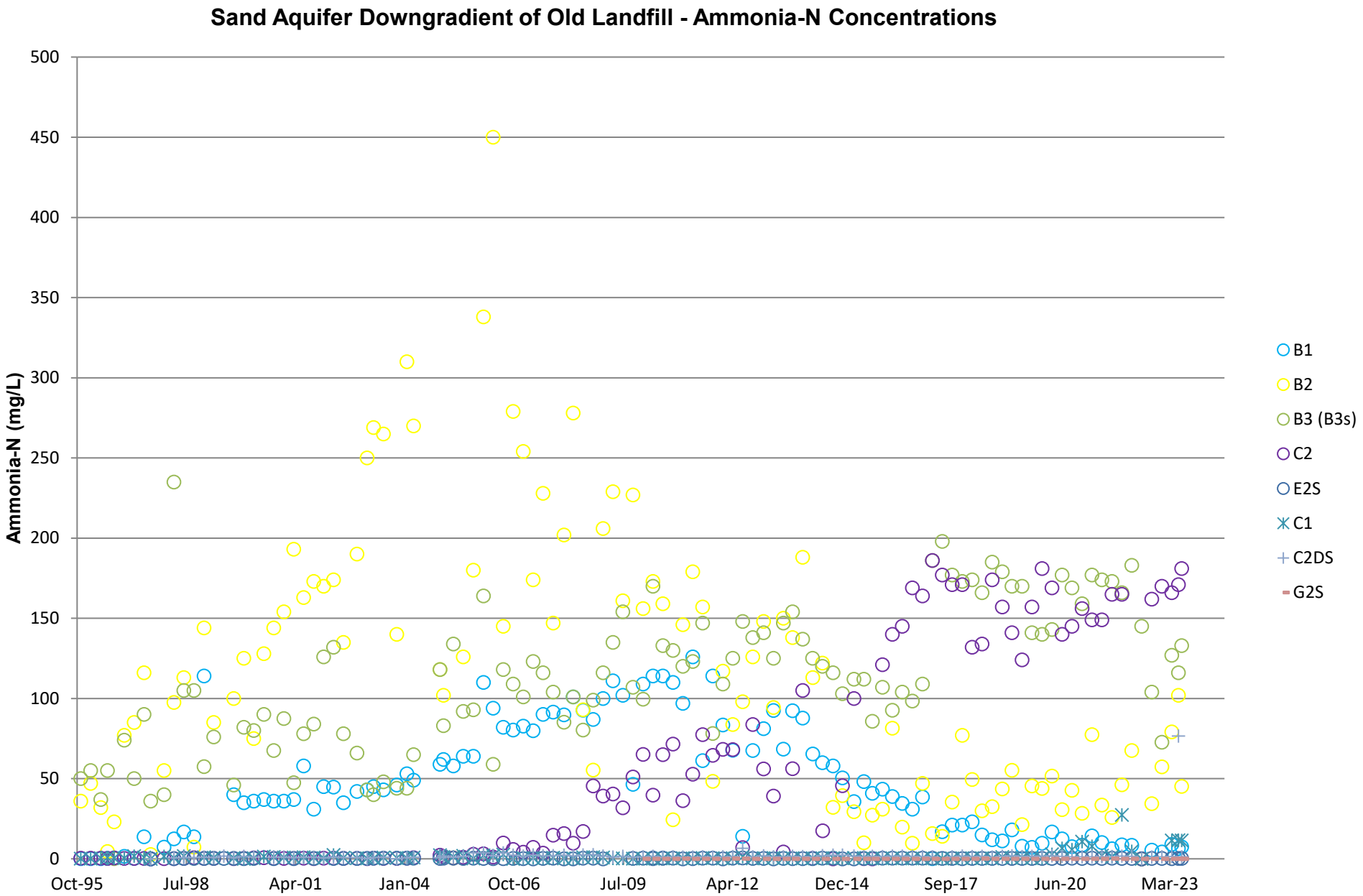

Gravel Aquifer - Conductivity Levels
Conductivity (mS/m)
500
450
400
350
300
250
200
150
100
50
0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
E1D
C2DD
E2D
G1D

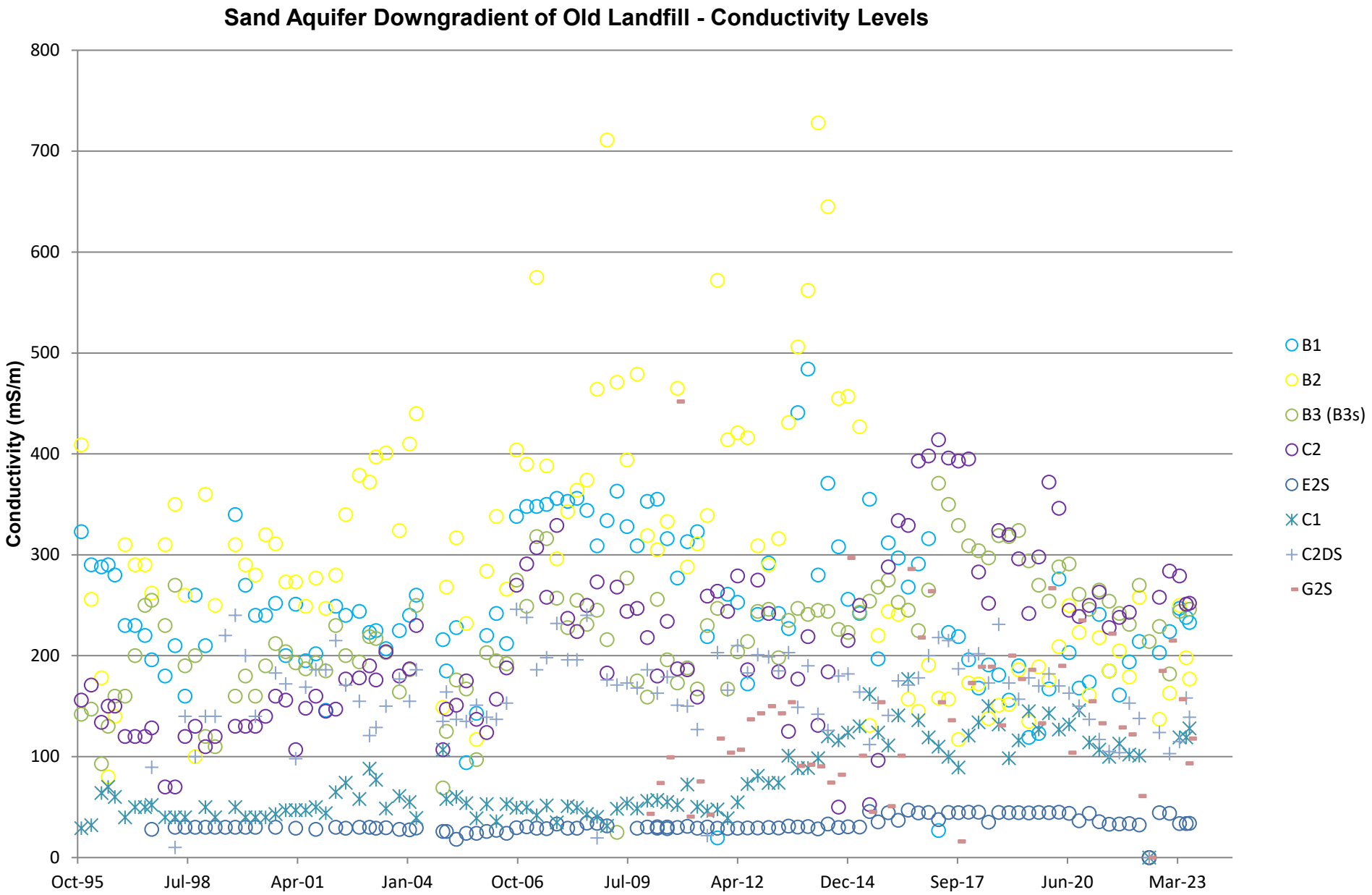

Gravel Aquifer - Sodium Levels
Sodium (mg/L)
400
350
300
250
200
150
100
50
0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
E1D
C2DD
E2D
G1D

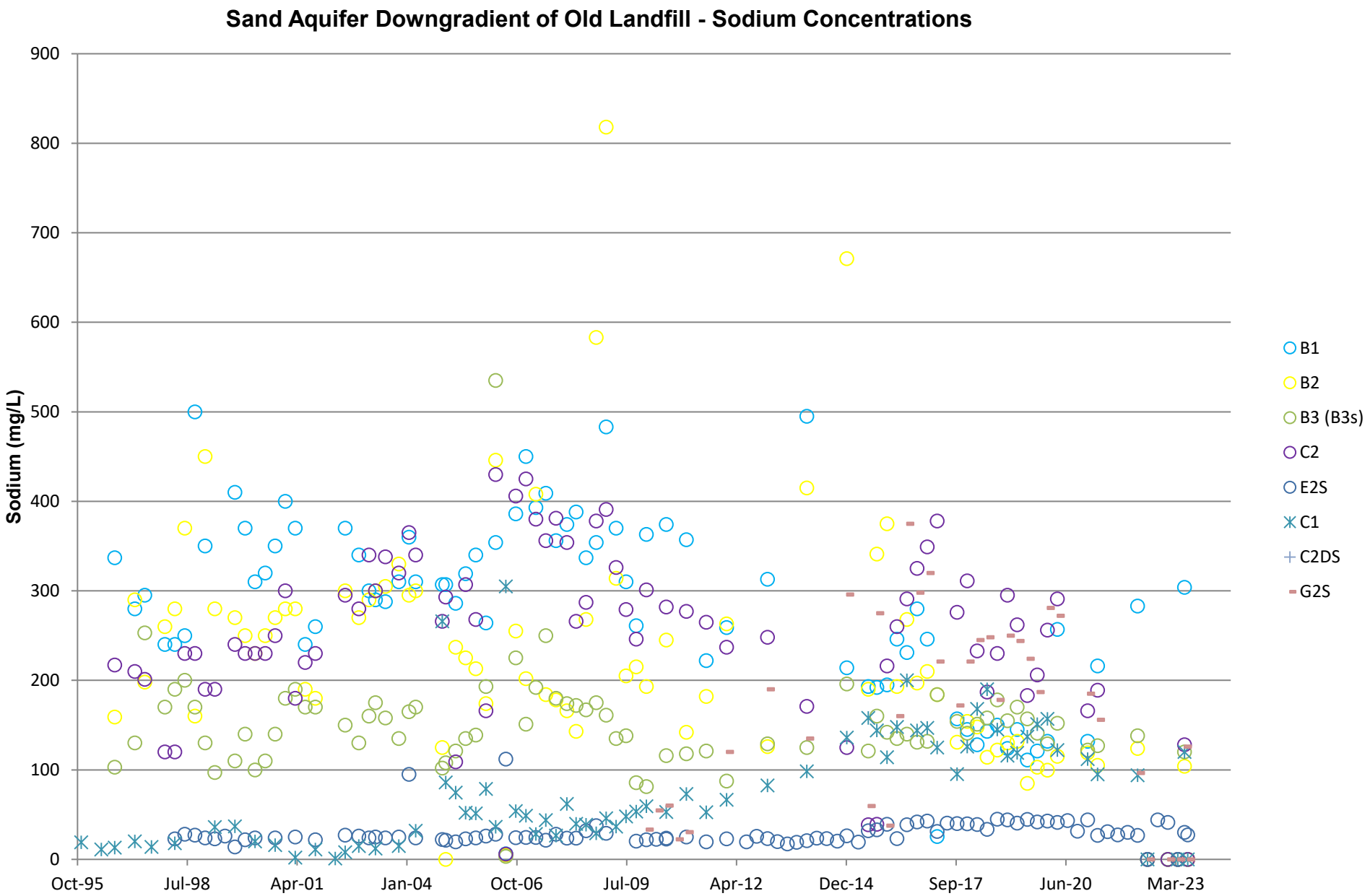

Gravel Aquifer - E. coli
E. coli (CFU/mL)
250
200
150
100
50
0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
E1D
C2DD
E2D
G1D
NZDWS MAV E. coli Trigger Value

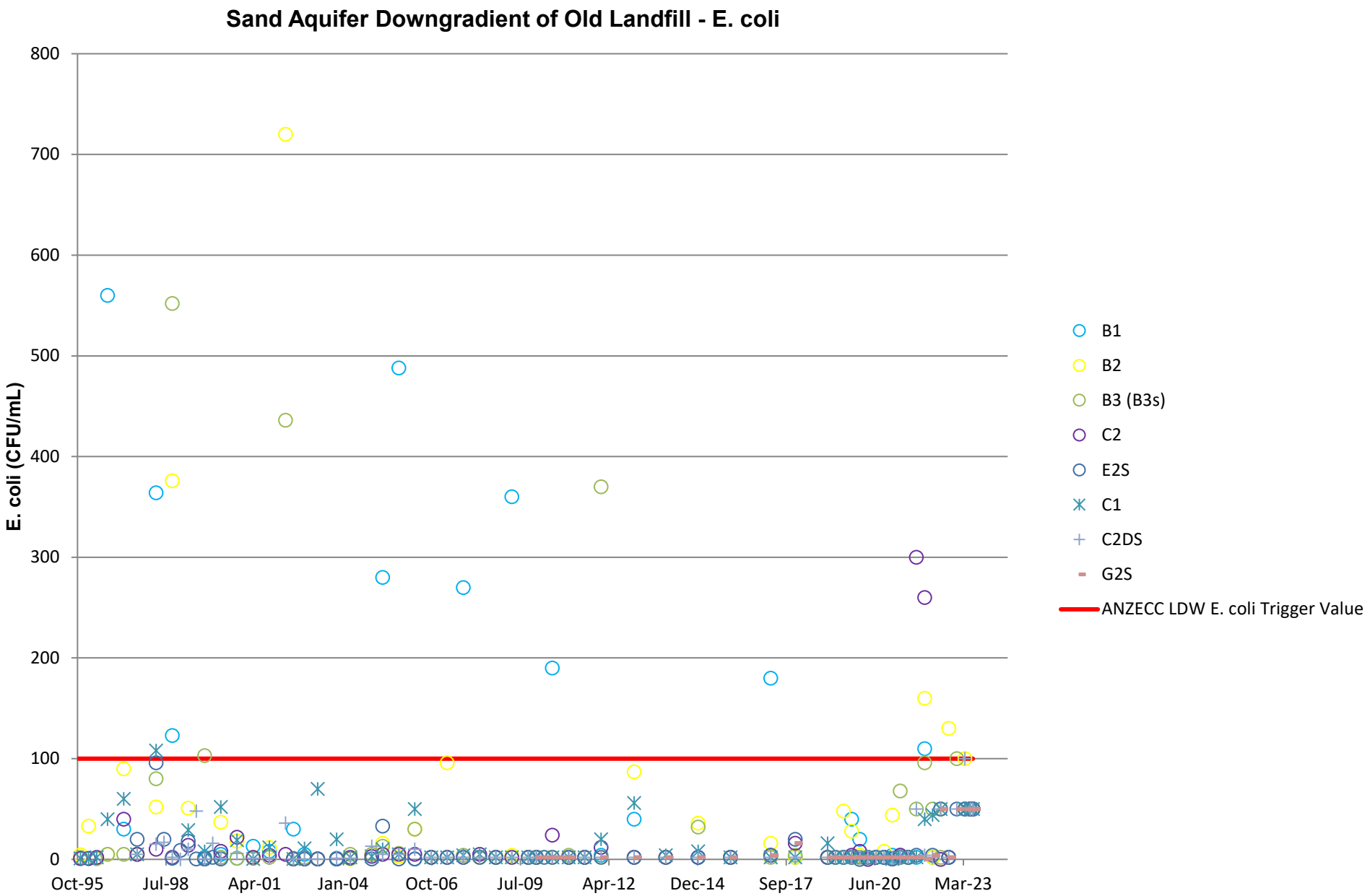

Sand Aquifer Downgradient of Old Landfill - Boron Concentrations
Boron (mg/L)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
B1
B2
B3 (B3s)
C2
E2S
C1
C2DS
G2S


Sand Aquifer Downgradient of Old Landfill - Chloride Concentrations
Chloride (mg/L)
2500
2000
1500
1000
500
0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
B1
B2
B3 (B3s)
C2
E2S
C1
C2DS
G2S

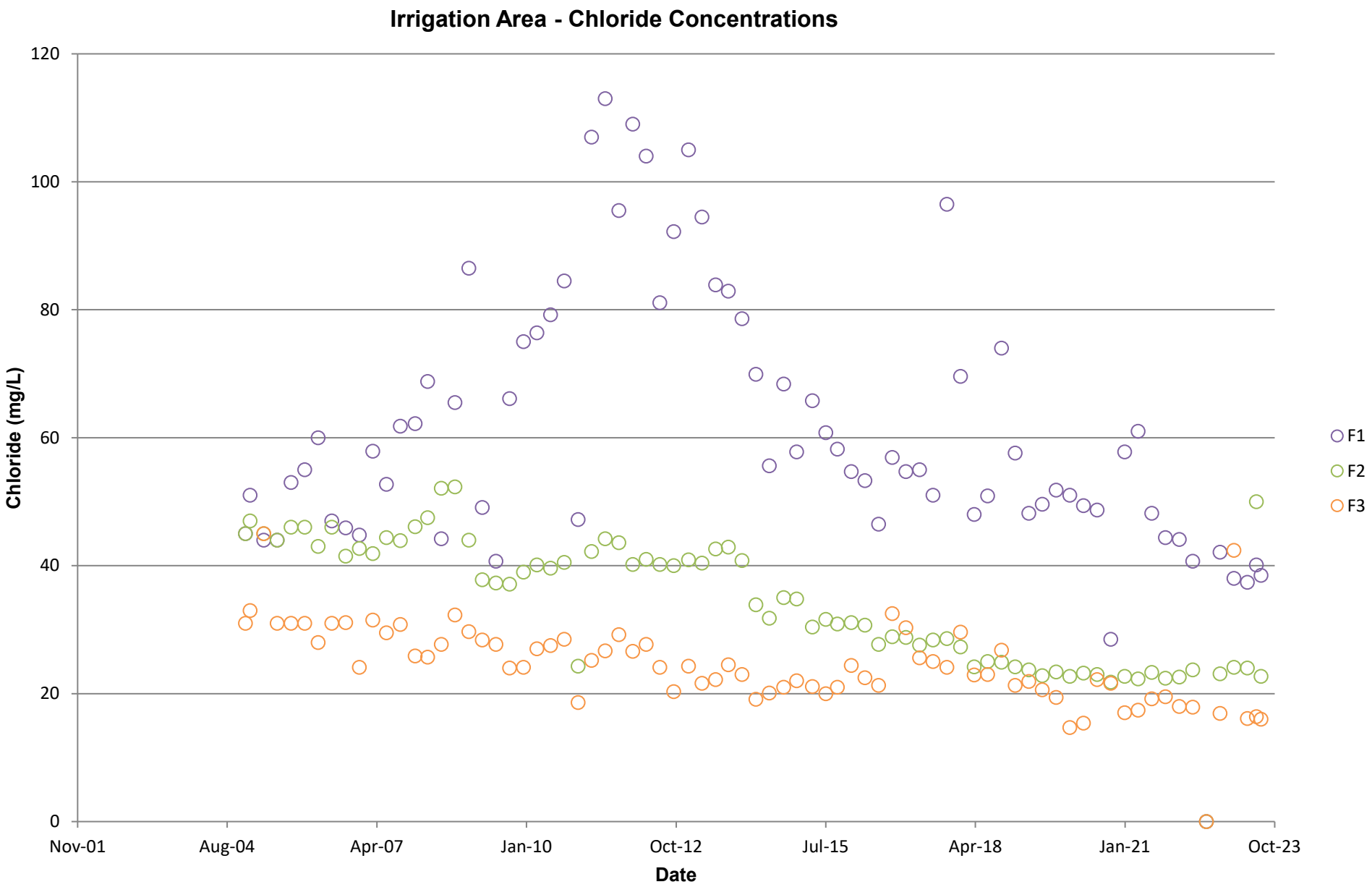

Sand Aquifer Downgradient of Old Landfill - Ammonia-N Concentrations
Ammonia-N (mg/L)
500
450
400
350
300
250
200
150
100
50
0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
B1
B2
B3 (B3s)
C2
E2S
C1
C2DS
G2S

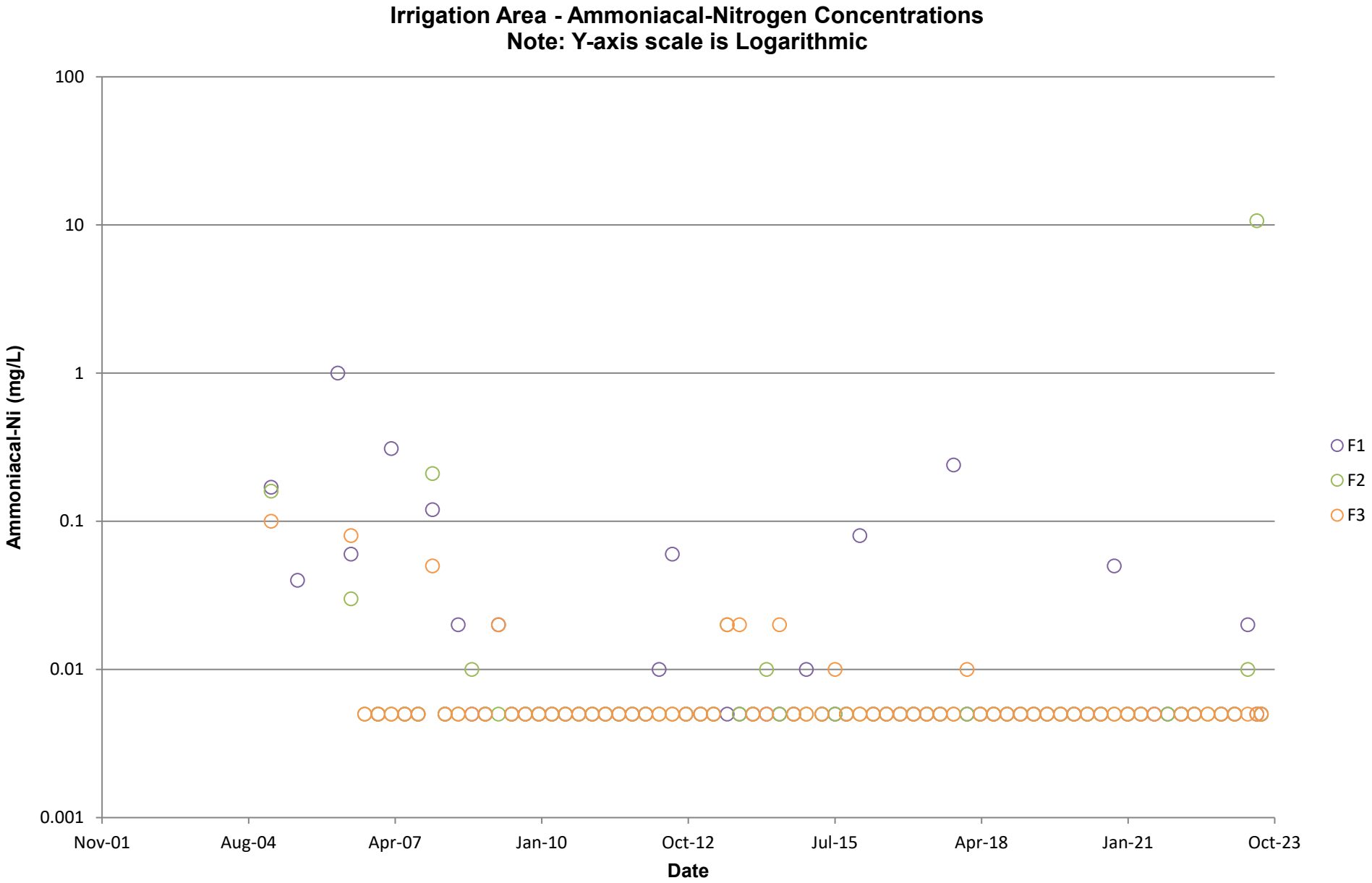

Sand Aquifer Downgradient of Old Landfill - Conductivity Levels
Conductivity (mS/m)
800
700
600
500
400
300
200
100
0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
B1
B2
B3 (B3s)
C2
E2S
C1
C2DS
G2S

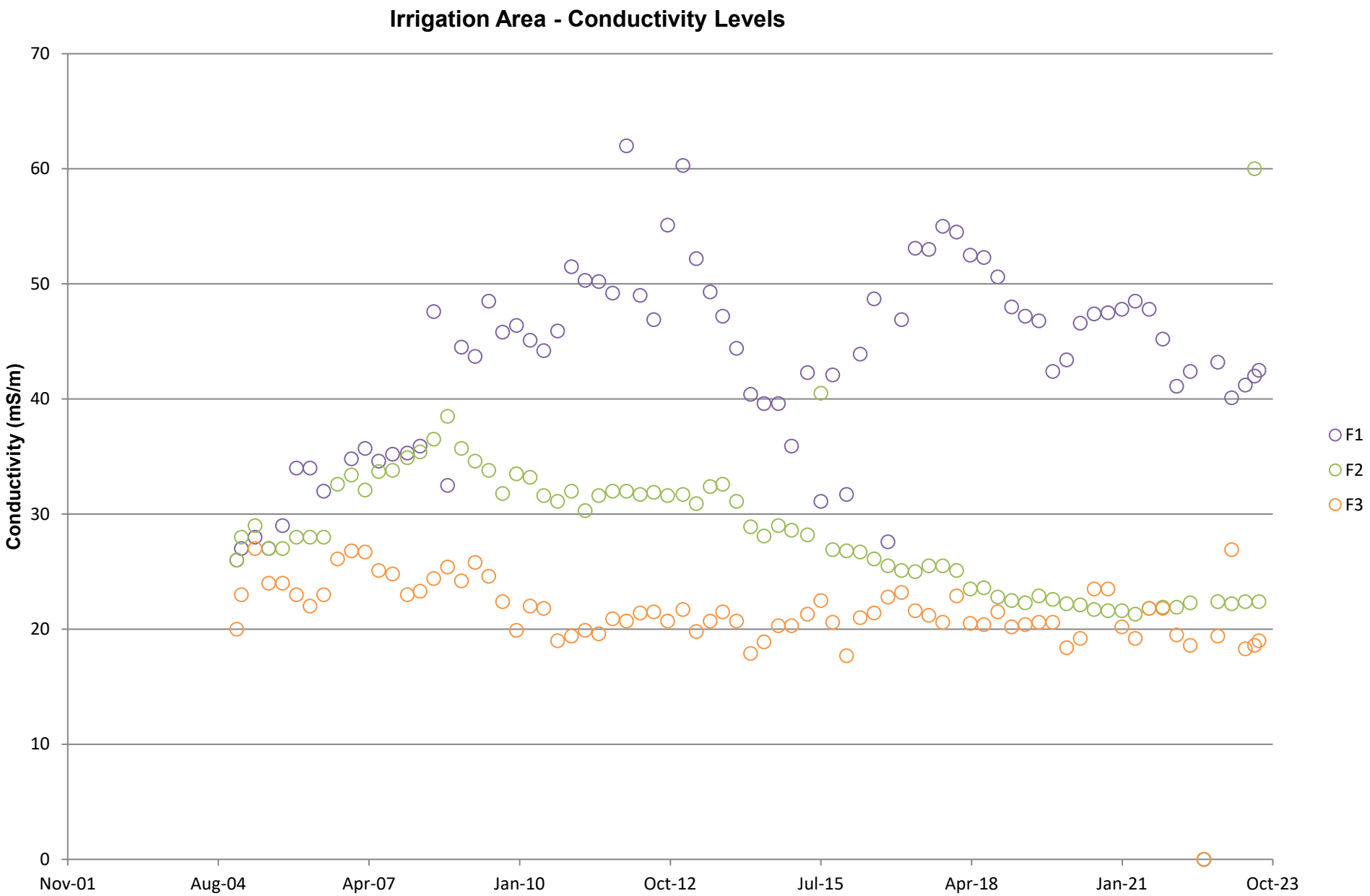

Sand Aquifer Downgradient of Old Landfill - Sodium Concentrations
Sodium (mg/L)
900
800
700
600
500
400
300
200
100
0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
B1
B2
B3 (B3s)
C2
E2S
C1
C2DS
G2S

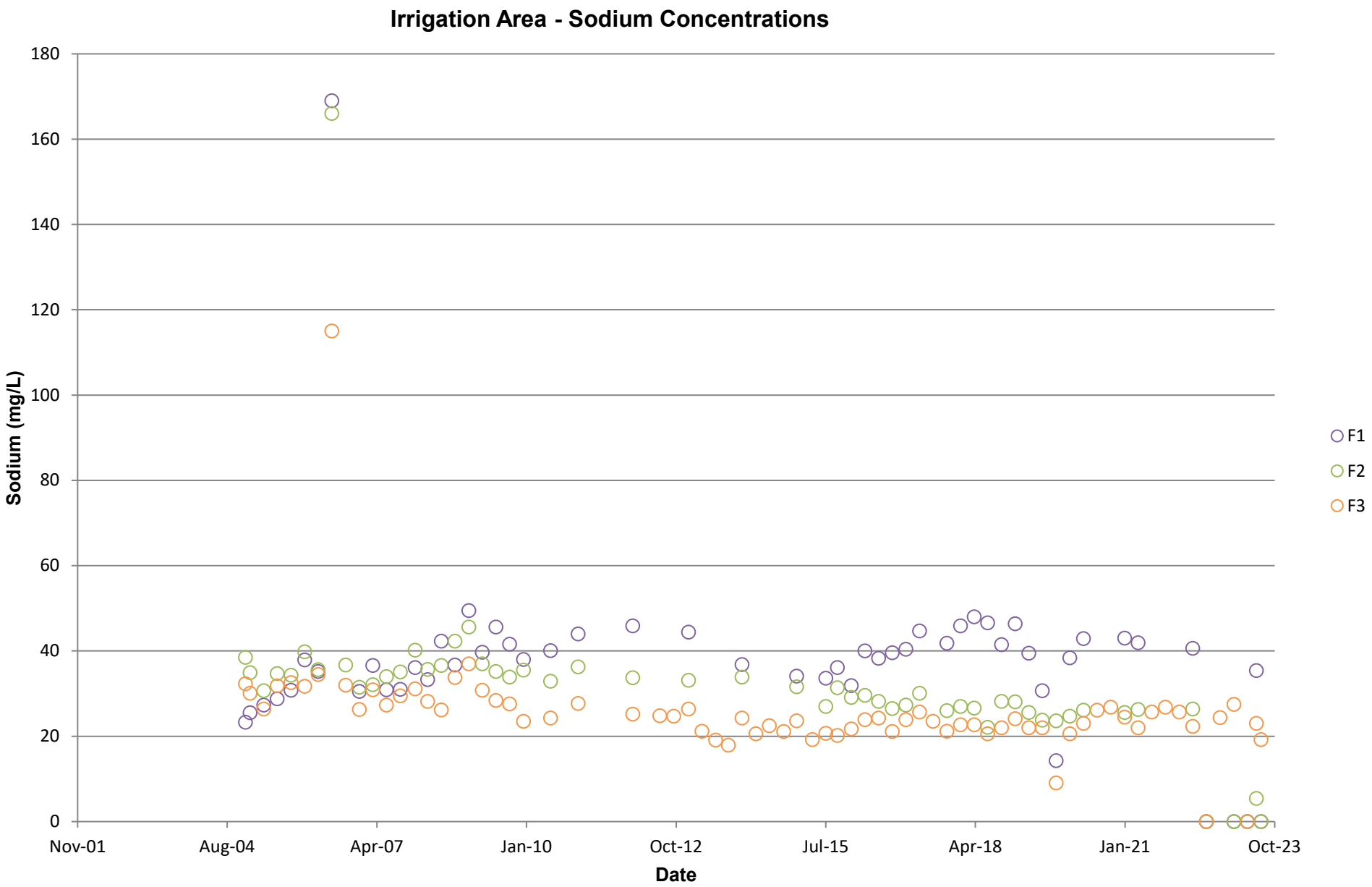

Sand Aquifer Downgradient of Old Landfill - E. coli
E. coli (CFU/mL)
800
700
600
500
400
300
200
100
0
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
B1
B2
B3 (B3s)
C2
E2S
C1
C2DS
G2S
ANZECC LDW E. coli Trigger Value

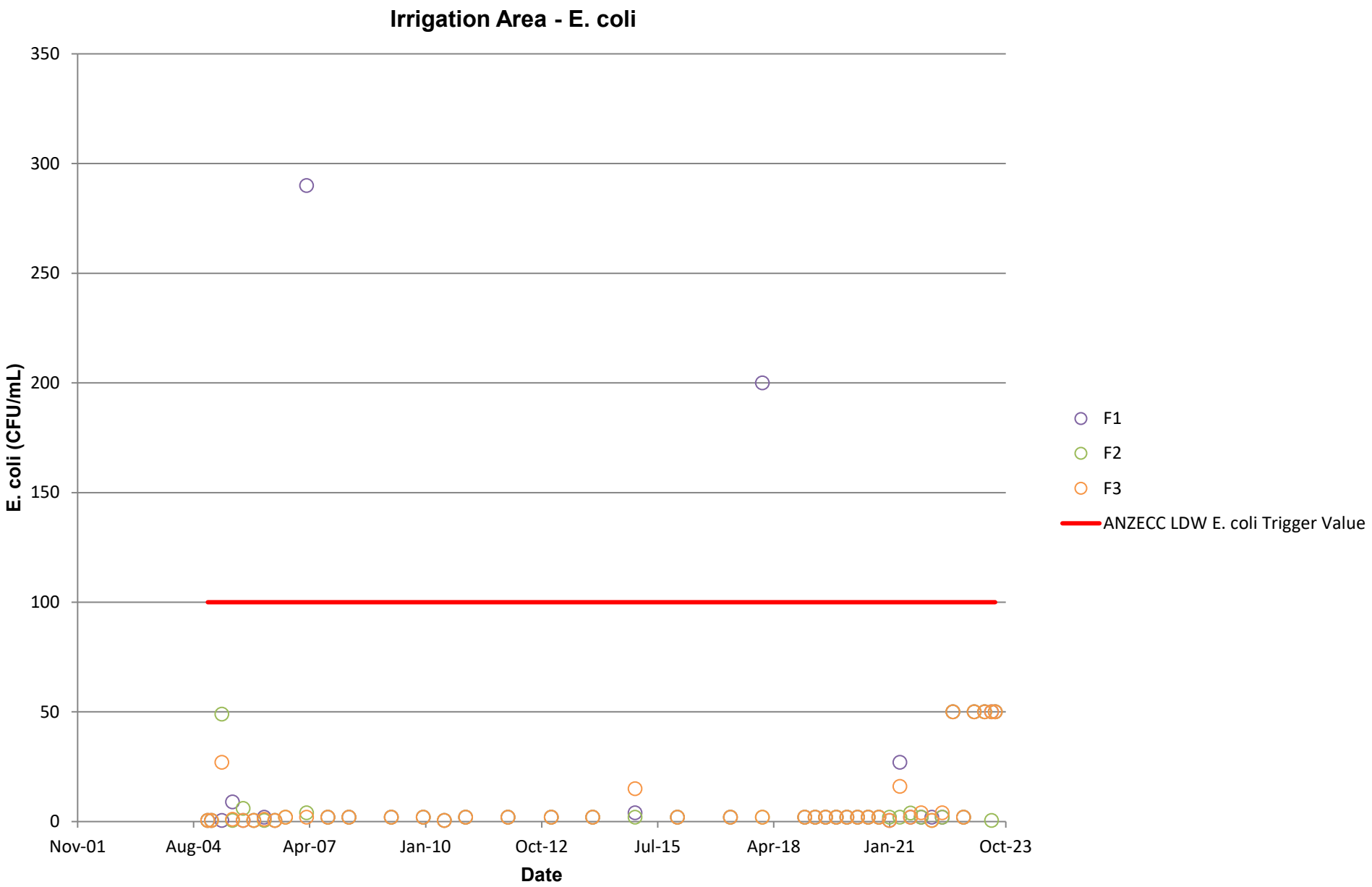

Irrigation Area - Boron Concentrations
Boron (mg/L)
400
350
300
250
200
150
100
50
0
Nov-01
Aug-04
Apr-07
Jan-10
Oct-12
Jul-15
Apr-18
Jan-21
Oct-23
F1
F2
F3

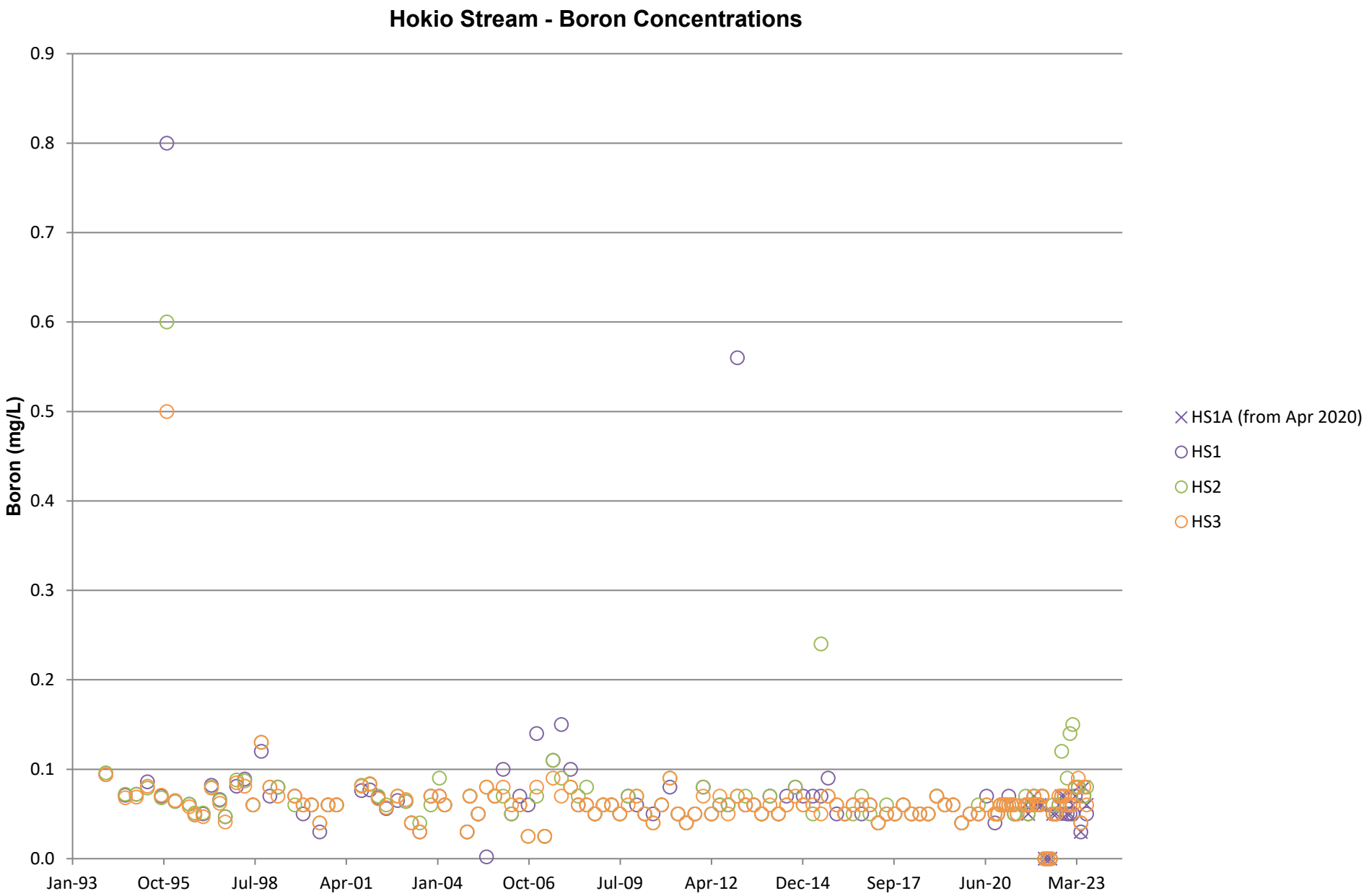

Irrigation Area - Chloride Concentrations
Chloride (mg/L)
120
100
80
60
40
20
0
Nov-01
Aug-04
Apr-07
Jan-10
Oct-12
Jul-15
Apr-18
Jan-21
Oct-23
Date
F1
F2
F3

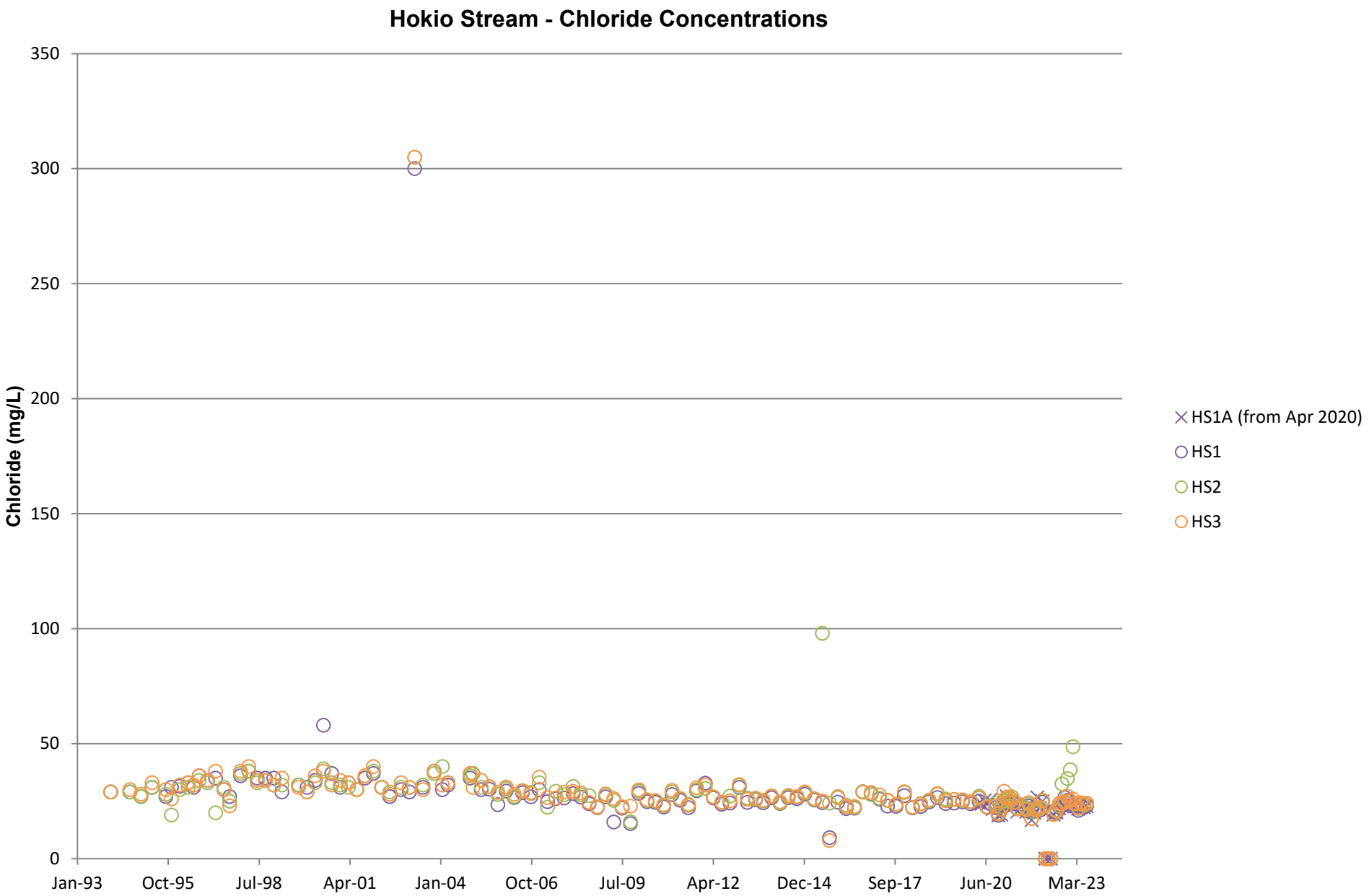

Irrigation Area - Ammoniacal-Nitrogen Concentrations
Note: Y-axis scale is Logarithmic
Ammoniacal-Ni (mg/L)
100
10
1
0.1
0.01
0.001
Nov-01
Aug-04
Apr-07
Jan-10
Oct-12
Jul-15
Apr-18
Jan-21
Oct-23
Date
F1
F2
F3

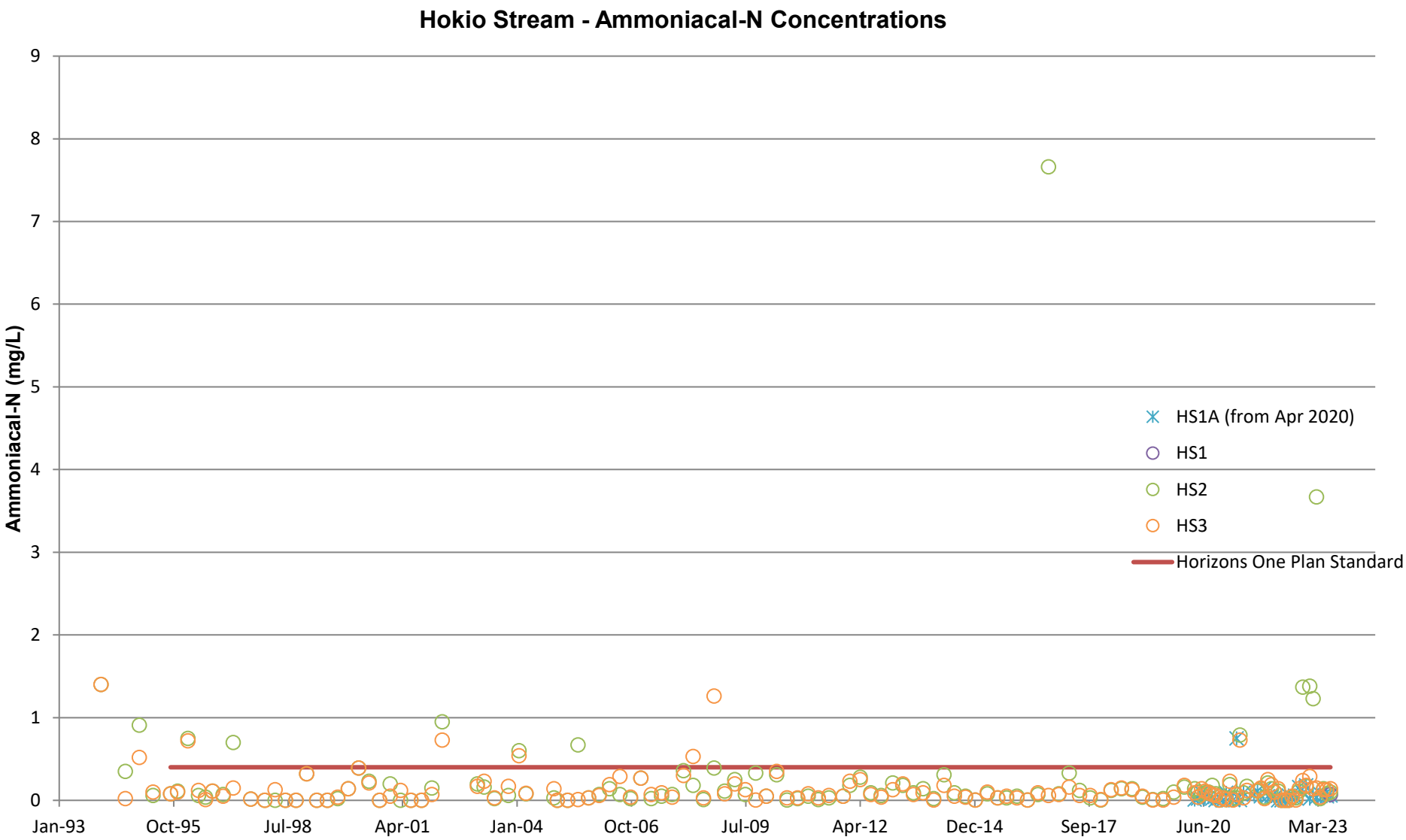

Irrigation Area - Conductivity Levels
Conductivity (mS/m)
70
60
50
40
30
20
10
0
Nov-01
Aug-04
Apr-07
Jan-10
Oct-12
Jul-15
Apr-18
Jan-21
Oct-23
F1
F2
F3

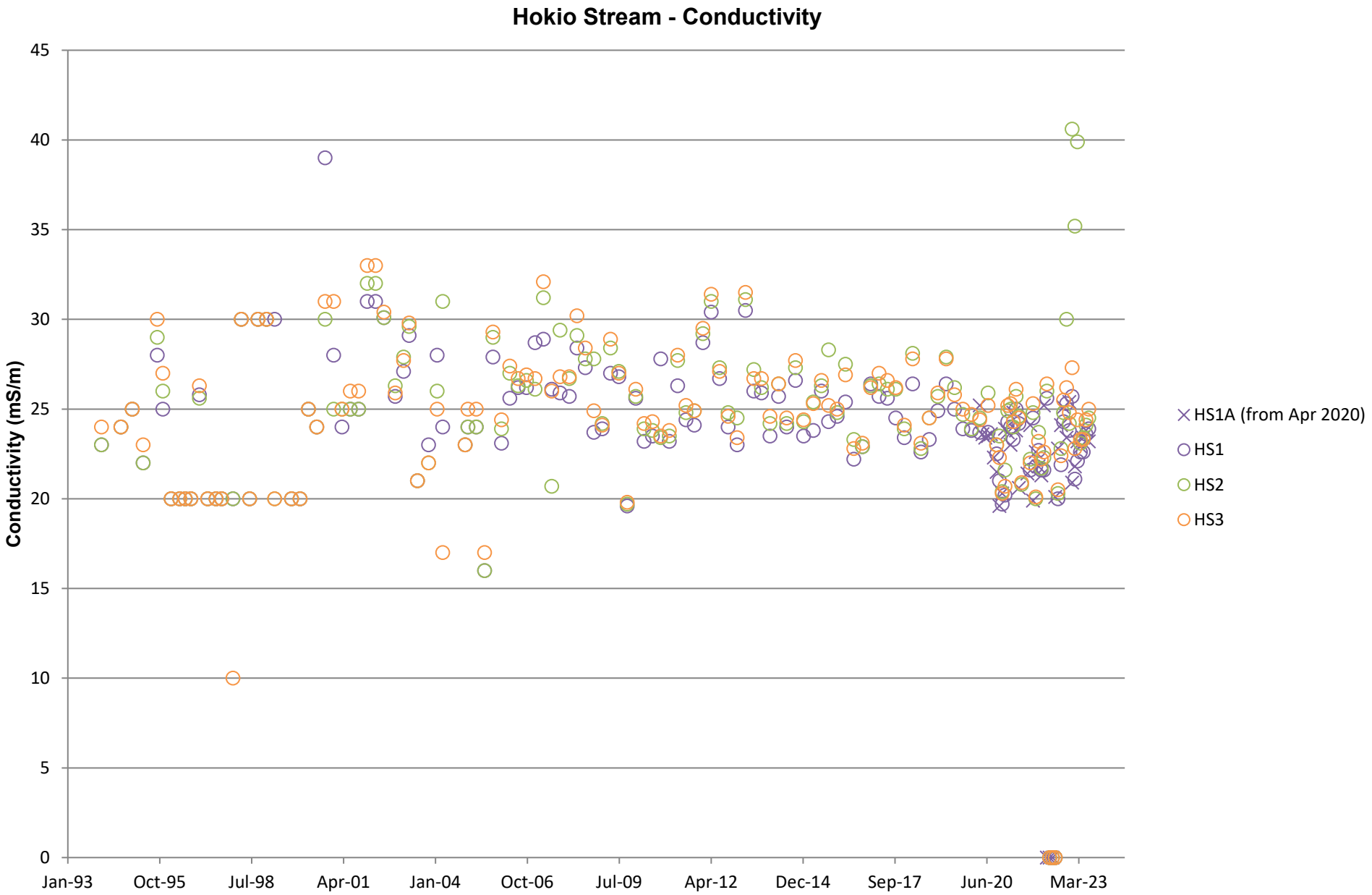

Irrigation Area - Sodium Concentrations
Sodium (mg/L)
180
160
140
120
100
80
60
40
20
0
Nov-01
Aug-04
Apr-07
Jan-10
Oct-12
Jul-15
Apr-18
Jan-21
Oct-23
Date
F1
F2
F3

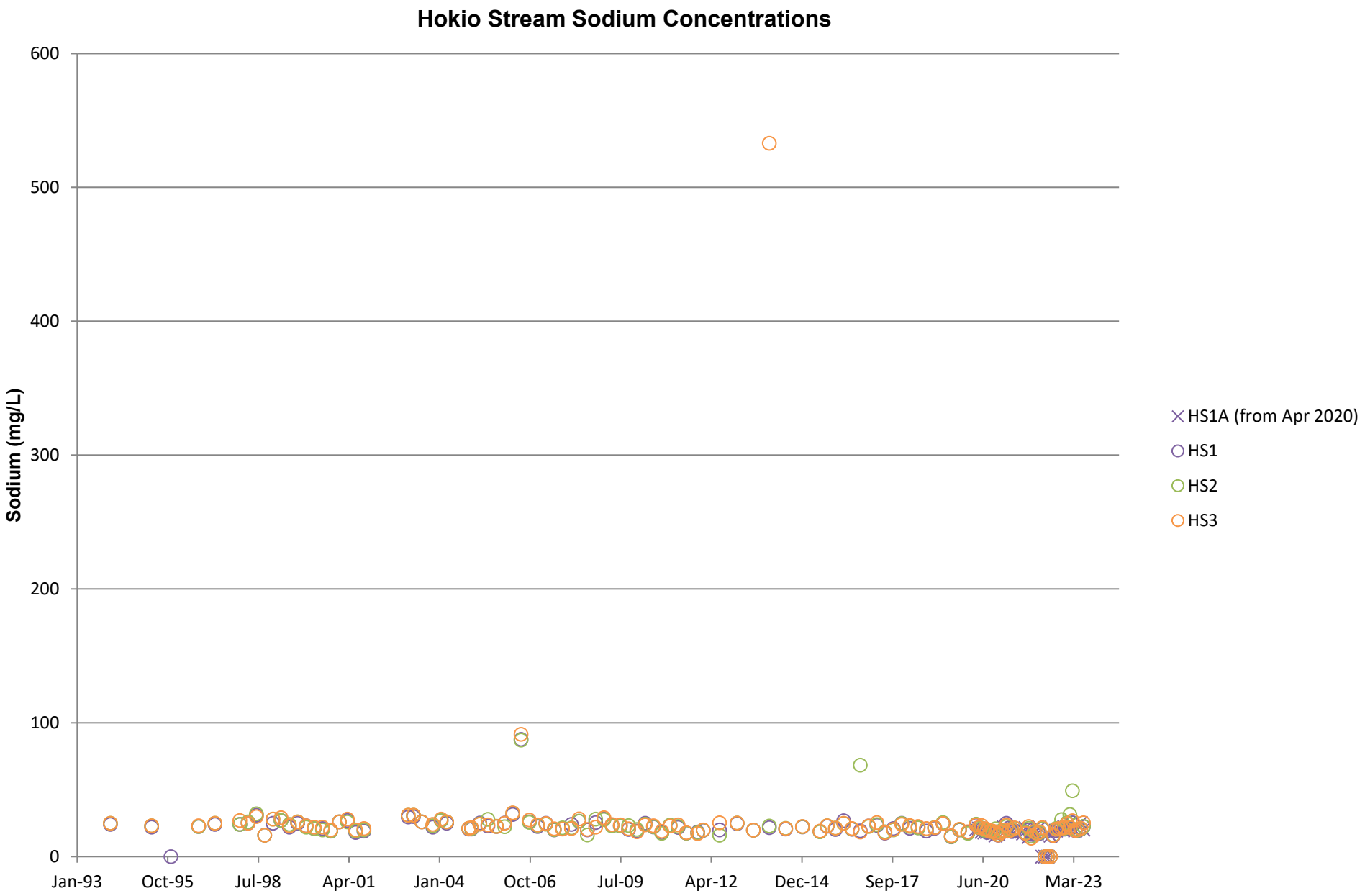

Irrigation Area - E. coli
E. coli (CFU/mL)
350
300
250
200
150
100
50
0
Nov-01
Aug-04
Apr-07
Jan-10
Oct-12
Jul-15
Apr-18
Jan-21
Oct-23
Date
F1
F2
F3
ANZECC LDW E. coli Trigger Value

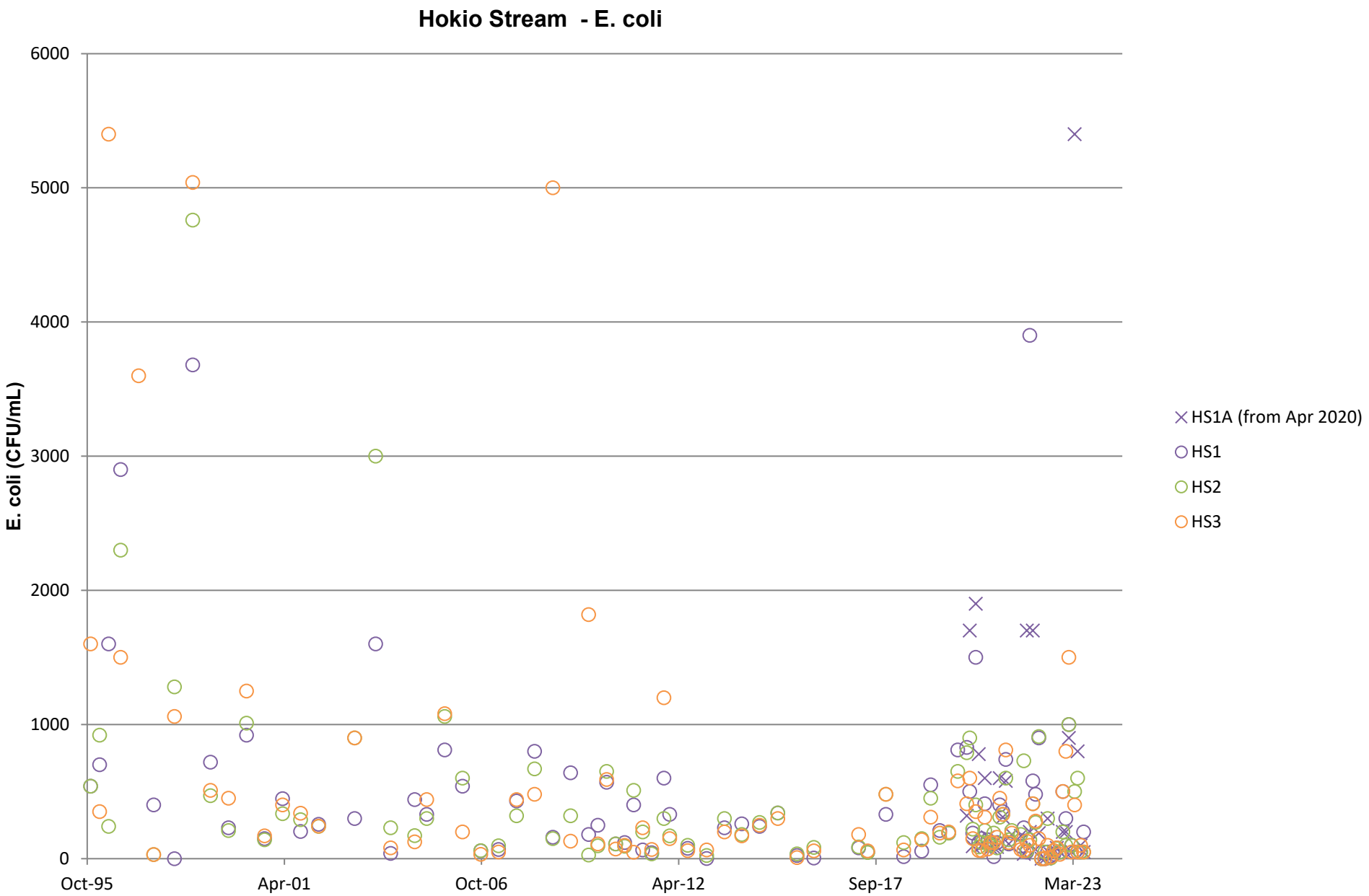

Hokio Stream - Boron Concentrations
Boron (mg/L)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Jan-93
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
HS1A (from Apr 2020)
HS1
HS2
HS3


Hokio Stream - Chloride Concentrations
Chloride (mg/L)
350
300
250
200
150
100
50
0
Jan-93
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
HS1A (from Apr 2020)
HS1
HS2
HS3


Hokio Stream - Ammoniacal-N Concentrations
Ammoniacal-N (mg/L)
9
8
7
6
5
4
3
2
1
0
Jan-93
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
HS1A (from Apr 2020)
HS1
HS2
HS3
Horizons One Plan Standard


Hokio Stream - Conductivity
Conductivity (mS/m)
45
40
35
30
25
20
15
10
5
0
Jan-93
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
HS1A (from Apr 2020)
HS1
HS2
HS3


Hokio Stream Sodium Concentrations
Sodium (mg/L)
600
500
400
300
200
100
0
Jan-93
Oct-95
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20
Mar-23
HS1A (from Apr 2020)
HS1
HS2
HS3


Hokio Stream - E. coli
E. coli (CFU/mL)
6000
5000
4000
3000
2000
1000
0
Oct-95
Apr-01
Oct-06
Apr-12
Sep-17
Mar-23
HS1A (from Apr 2020)
HS1
HS2
HS3

Appendix E Landfill Gas Monitoring Results at GW Bores for April/June 2023

Date	Borehole	Methane (% CH_4)	Carbon Dioxide (% CO_2)	Hydrogen Sulphide (ppm H_2S)	Oxygen (% O_2)
3/04/2023	Levin Landfill: Levin B1	0.02	0.18	0	20.8
3/04/2023	Levin Landfill: Levin B2	0	1.48	0	19.6
3/04/2023	Levin Landfill: Levin B3s	0	0.12	0	20.8
3/04/2023	Levin Landfill: Levin C1	0	0.11	0	21
3/04/2023	Levin Landfill: Levin C2	0.08	0.19	0	20.8
3/04/2023	Levin Landfill: Levin C2dd	0	0.2	0	20.8
3/04/2023	Levin Landfill: Levin C2ds	0.03	0.14	0	20.7
3/04/2023	Levin Landfill: Levin D1	0.09	0.07	0	20.9
3/04/2023	Levin Landfill: Levin D2	0	0.09	0	20.8
3/04/2023	Levin Landfill: Levin D3rd	0	0.05	0	21.2
3/04/2023	Levin Landfill: Levin D3rs	0	0.1	0	21
3/04/2023	Levin Landfill: Levin D4	0.06	0.05	0	20.8
3/04/2023	Levin Landfill: Levin D5	0	0.09	0	21.1
3/04/2023	Levin Landfill: Levin D6	0.12	0.05	0	20.5
3/04/2023	Levin Landfill: Levin E1d	0	0.04	0	20.5
3/04/2023	Levin Landfill: Levin E1s	0	0.04	0	20.6
3/04/2023	Levin Landfill: Levin E2d	0	0.07	0	21
3/04/2023	Levin Landfill: Levin E2s	0	0.08	0	21
3/04/2023	Levin Landfill: Levin F1	0.01	0.05	0	20.8
3/04/2023	Levin Landfill: Levin F2	0	0.06	0	21.2
3/04/2023	Levin Landfill: Levin F3	0	0.07	0	21.2
3/04/2023	Levin Landfill: Levin G1d	0.03	0.04	0	20.6
3/04/2023	Levin Landfill: Levin G1s	0.03	0.03	1	20.6
3/04/2023	Levin Landfill: Levin G2s	0.03	0.44	0	20.7
3/04/2023	Levin Landfill: Levin Xd1	0	0.05	0	20.9
3/04/2023	Levin Landfill: Levin Xs1	0	0.22	0	20.37
3/04/2023	Levin Landfill: Levin Xs2	0.03	0.52	0	20.7
9/06/2023	Levin Landfill: Levin B1	0.01	0.49	0	20.8
9/06/2023	Levin Landfill: Levin B2	0.01	1.09	0	18.6
9/06/2023	Levin Landfill: Levin B3s	0	0.13	0	21.1
8/06/2023	Levin Landfill: Levin C1	0.01	20.2	0	20.2
9/06/2023	Levin Landfill: Levin C2	0	0.18	0	21.1
9/06/2023	Levin Landfill: Levin C2dd	0	0.17	0	21.1
9/06/2023	Levin Landfill: Levin C2ds	0	0.15	0	21.2
8/06/2023	Levin Landfill: Levin D1	0	0.32	0	20.3
9/06/2023	Levin Landfill: Levin D2	0	0.29	0	20.6
9/06/2023	Levin Landfill: Levin D3rd	0	0.08	0	21.3
8/06/2023	Levin Landfill: Levin D3rs	0	0.09	0	21.2
8/06/2023	Levin Landfill: Levin D4	0	0.14	0	21.4
8/06/2023	Levin Landfill: Levin D5	0	0.1	0	21.5
8/06/2023	Levin Landfill: Levin D6	0.12	0.6	0	19.8
9/06/2023	Levin Landfill: Levin E1d	0	0.09	0	21.4
8/06/2023	Levin Landfill: Levin E1s	0	0.08	0	21.5
9/06/2023	Levin Landfill: Levin E2d	0	0.17	0	21.1
9/06/2023	Levin Landfill: Levin E2s	0	0.11	0	21
9/06/2023	Levin Landfill: Levin F1	0.03	0.2	0	20.9
9/06/2023	Levin Landfill: Levin F2	0	0.11	0	20.07

9/06/2023	Levin Landfill: Levin F3	0	0.07	0	20.6
9/06/2023	Levin Landfill: Levin G1d	0	0.06	0	20.1
9/06/2023	Levin Landfill: Levin G1s	0.02	0.15	0	20.3
8/06/2023	Levin Landfill: Levin G2s	0.01	1.5	0	19.1
9/06/2023	Levin Landfill: Levin Xd1	0	0.1	0	20.5
9/06/2023	Levin Landfill: Levin Xs1	0	0.2	0	20.6
8/06/2023	Levin Landfill: Levin Xs2	0	0.54	0	20.7
8/06/2023		0.01	1.5	0	

CREATING COMMUNITIES

Communities are fundamental. Whether around the corner or across the globe, they provide a foundation, a sense of belonging. That's why at Stantec, we always **design with community in mind**.

We care about the communities we serve—because they're our communities too. We're designers, engineers, scientists, and project managers, innovating together at the intersection of community, creativity, and client relationships. Balancing these priorities results in projects that advance the quality of life in communities across the globe.

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