Stratford District Council Closed Landfills (Stratford, Huiroa and Pukengahu)

Monitoring Programme

Annual Report

2022-2023

Technical Report 2023-48

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Taranaki Regional Council

Taranaki Regional Council
Private Bag 713
Stratford

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Executive summary

The Stratford District Council (SDC) maintains a closed landfill located on Victoria Road at Stratford, in the Pātea catchment. The landfill was closed to the public on 11 March 2002, and to commercial disposers on 23 March 2002. The site has more recently been used to dewater and dispose of oxidation pond sludge from the adjacent municipal wastewater treatment plant. This activity ceased in early 2006, and the landfill was recapped and reinstated. The only external material now accepted at the landfill is soil from a local sawmill site remediation project. This activity is covered by separate consent[1] held by a third party.

SDC also maintains closed landfills at Douglas Road, Huiroa, and Wingrove Road, Pukengahu, in the Pātea catchment. Both the Huiroa and Pukengahu landfills have been closed since 1991, but are still monitored with regards to maintenance and leachate discharge on a triennial basis. Triennial monitoring of these sites was previously undertaken in the 2020-2021 year.

During the monitoring period, SDC demonstrated a high level of environmental performance and high level of administrative performance.

This report for the period July 2022 to June 2023 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess SDC's environmental and consent compliance performance during the period under review. The report also details the results of the monitoring undertaken and assesses the environmental effects of SDC's activities.

SDC holds three resource consents in association with these landfills, which include a total of 17 conditions setting out the requirements that SDC must satisfy. The consents allow SDC to discharge stormwater and leachate from the landfills.

The Council's monitoring programme for the year under review for the Stratford closed landfill included two site inspections, six groundwater samples collected for physicochemical analysis, and two biomonitoring surveys of receiving waters. This report also includes the results of the surface water samples taken in conjunction with the Stratford Wastewater Treatment Plant (WWTP).

The monitoring showed that there were no significant adverse effects occurring as a result of the exercise of the Stratford landfill consent. There were no unauthorised incidents noted in respect to the Stratford landfill during the year under review.

During the year, SDC demonstrated a high level of environmental and high level of administrative performance with the Stratford landfill resource consent.

Monitoring was not undertaken during the year under review in relation to the Huiroa and Pukengahu closed landfills. These sites will next be monitored during the 2023-2024 period.

For reference, in the 2022-2023 year, consent holders were found to achieve a high level of environmental performance and compliance for 878 (87%) of a total of 1007 consents monitored through the Taranaki tailored monitoring programmes, while for another 96 (10%) of the consents a good level of environmental performance and compliance was achieved. A further 27 (3%) of consents monitored required improvement in their performance, while the remaining one (<1%) achieved a rating of poor.

In terms of overall environmental and compliance performance by the consent holder over the last several years, this report shows that the consent holder's performance remains at a high level.

This report includes recommendations for the 2023-2024 year.

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[1] Consent 7645-1 Alby M Limited

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1 Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is for the period July 2022 to June 2023 by the Council describing the monitoring programme associated with resource consents held by Stratford District Council (SDC). SDC maintains closed landfills on Victoria Road, Stratford, on Douglas Road, Huiroa, and on Wingrove Road, Pukengahu.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by SDC that relate to discharges of leachate and stormwater from the three closed landfills within the Pātea catchment, in the Stratford district. The Huiroa and Pukengahu landfills are monitored on a triennial cycle, with monitoring of these sites next scheduled to be undertaken in 2023-2024.

1.1.2 Structure of this report

Section 1 of this report is a background section. It sets out general information about:

- consent compliance monitoring under the *Resource Management Act 1991* (RMA) and the Council's obligations;
- the Council's approach to monitoring sites though annual programmes;
- the resource consents held by SDC in the Pātea catchment;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted at the sites.

Section 2 presents the results of monitoring during the period under review, including scientific and technical data.

Section 3 discusses the results, their interpretations, and their significance for the environment.

Section 4 presents recommendations to be implemented in the 2023-2024 monitoring year.

A glossary of common abbreviations and scientific terms, and a bibliography, are presented at the end of the report.

1.1.3 The Resource Management Act 1991 and monitoring

The RMA primarily addresses environmental 'effects' which are defined as positive or adverse, temporary or permanent, past, present or future, or cumulative. Effects may arise in relation to:

a. the neighbourhood or the wider community around an activity, and may include cultural and social-economic effects;
b. physical effects on the locality, including landscape, amenity and visual effects;
c. ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;
d. natural and physical resources having special significance (for example recreational, cultural, or aesthetic); and
e. risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Council is recognising the comprehensive meaning of 'effects' in as much as is appropriate for each

activity. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the RMA to assess the effects of the exercise of consents. In accordance with Section 35 of the RMA, the Council undertakes compliance monitoring for consents and rules in regional plans, and maintains an overview of the performance of resource users and consent holders. Compliance monitoring, including both activity and impact monitoring, enables the Council to continually re-evaluate its approach and that of consent holders to resource management and, ultimately, through the refinement of methods and considered responsible resource utilisation, to move closer to achieving sustainable development of the region's resources.

1.1.4 Evaluation of environmental performance

Besides discussing the various details of the performance and extent of compliance by the consent holders, this report also assigns a rating as to each Company's environmental and administrative performance during the period under review. The rating categories are high, good, improvement required and poor for both environmental and administrative performance. The interpretations for these ratings are found in Appendix II.

For reference, in the 2022-2023 year, consent holders were found to achieve a high level of environmental performance and compliance for 878 (87%) of a total of 1007 consents monitored through the Taranaki tailored monitoring programmes, while for another 96 (10%) of the consents a good level of environmental performance and compliance was achieved. A further 27 (3%) of consents monitored required improvement in their performance, while the remaining one (<1%) achieved a rating of poor.[2]

1.2 Resource consents

SDC holds three resource consents, the details of which are summarised in the table below. Summaries of the conditions attached to each permit are set out in Section 3 of this report.

A summary of the various consent types issued by the Council is included in Appendix I, as are copies of all permits held by the Company during the period under review.

Table 1 Stratford District Council landfill consents

Consent number	Location	Purpose	Granted	Review	Expires
3889-3	Stratford	To discharge leachate into land and into groundwater adjacent to the Pātea River	December 2010	-	1 June 2028
3890-3	Huiroa	To discharge stormwater and leachate from the former Huiroa landfill onto and into land in the vicinity of an unnamed tributary of the Makuri Stream	June 2016	June 2028	1 June 2034
3891-3	Pukengahu	To discharge stormwater and leachate from the former Pukengahu landfill into an unnamed tributary of the Waihapa Stream	June 2016	June 2028	1 June 2034

[2] The Council has used these compliance grading criteria for more than 19 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

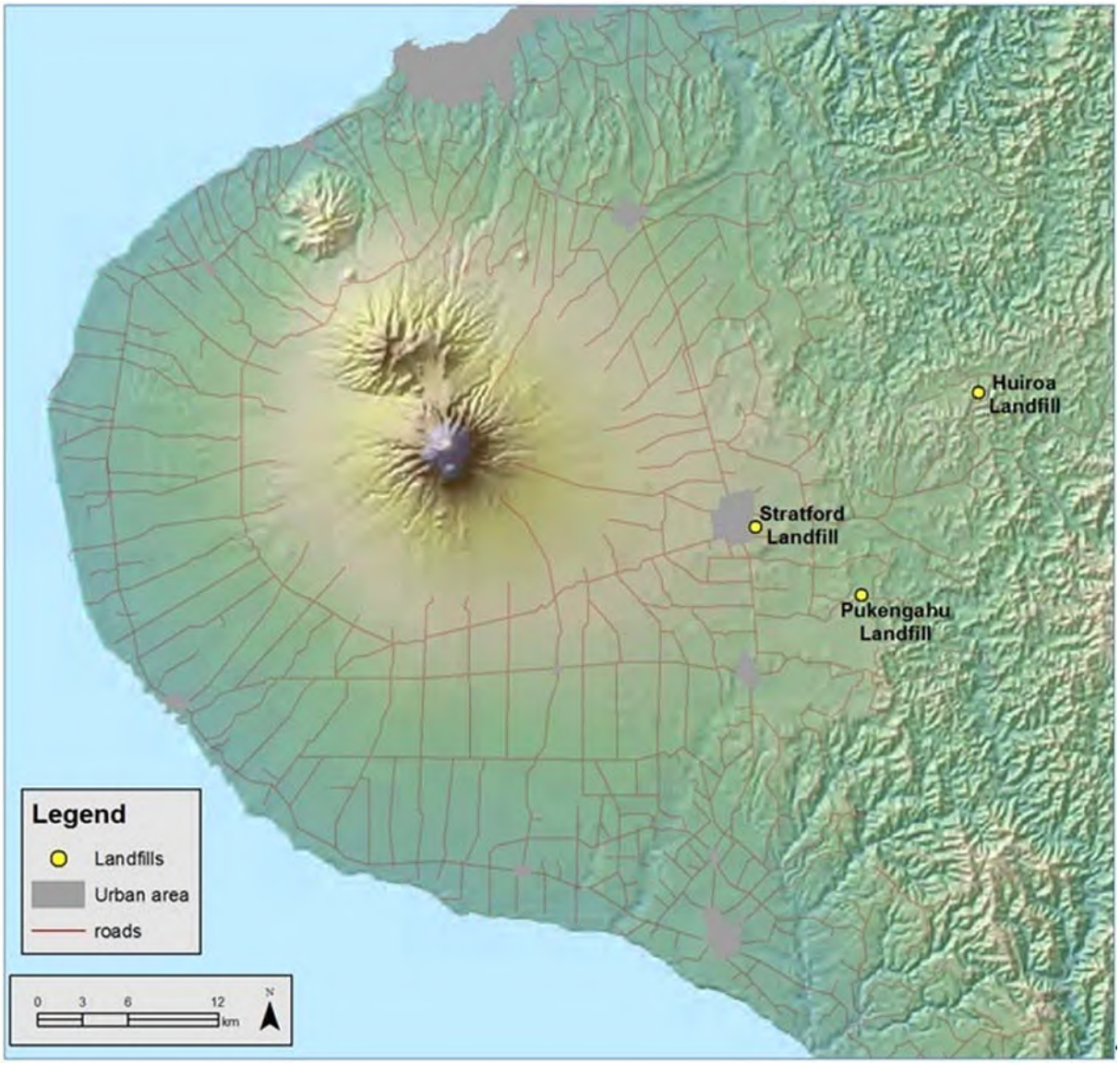


Figure 1 Regional map showing SDC landfill sites

1.3 Monitoring programme

1.3.1 Introduction

Section 35 of the RMA sets obligations upon the Council to gather information, monitor and conduct research on the exercise of resource consents within the Taranaki region. The Council is also required to assess the effects arising from the exercising of these consents and report upon them.

The Council may therefore make and record measurements of physical and chemical parameters, take samples for analysis, carry out surveys and inspections, conduct investigations and seek information from consent holders.

The Stratford landfill closed in 2006 and monitoring is conducted annually.

Both the Huiroa and Pukengahu landfills have been closed since 1991 but are still monitored with regards to leachate discharge and site maintenance. Monitoring at these sites is undertaken triennially, this was conducted during the 2020-2021 monitoring period and is next due in 2023-2024.

The monitoring programme for the SDC landfills consisted of four primary components.

1.3.2 Programme liaison and management

There is generally a significant investment of time and resources by the Council in:

- ongoing liaison with resource consent holders over consent conditions and their interpretation and application;
- discussion over monitoring requirements;
- preparation for any consent reviews, renewals or new consent applications;
- advice on the Council's environmental management strategies and content of regional plans; and
- consultation on associated matters.

1.3.3 Site inspections

The Stratford landfill site was visited on two occasions during the monitoring period.

Landfill inspections focused on the stability, integrity, and drainage of the caps, any potential or actual discharges to receiving watercourses, including potential for leachate discharges, and visual assessment of the receiving water quality.

1.3.4 Chemical sampling

The Pātea River in the vicinity of the Stratford landfill was sampled on one occasion, and the sample analysed for black disc transparency, biochemical oxygen demand, cadmium, chloride, conductivity, chromium, dissolved oxygen, dissolved reactive phosphorus, faecal coliforms, ammoniacal nitrogen, nitrate/nitrite nitrogen, dissolved oxygen saturation, pH, suspended solids, temperature, turbidity, and zinc.

The Council also undertook sampling of the groundwater at the Stratford landfill. Groundwater was sampled at three sites on two occasions, and the samples were analysed for alkalinity, dissolved zinc, chloride, conductivity, filtered chemical oxygen demand, dissolved chromium, dissolved copper, dissolved reactive phosphorus, ammoniacal nitrogen, nitrate/nitrite nitrogen, pH, temperature, water level and dissolved zinc.

1.3.5 Biomonitoring surveys

Biological surveys were performed on two occasions in the Pātea River to determine whether or not the Stratford landfill has had a detrimental effect upon the macroinvertebrate communities of the river.

2 Stratford landfill at Victoria Road

2.1 Process description

SDC operated a landfill located on Victoria Road at Stratford, in the Pātea catchment (Figure 2). The landfill was closed to the public on 11 March 2002, and to commercial disposers on 23 March 2002. All contaminated surface water from the landfill is pumped to the adjacent oxidation ponds for treatment.

In March 2004 SDC cleared a site on top of the landfill and created a bunded area for the purpose of oxidation pond sludge dewatering. This dewatering process continued through to early 2006 and the sludge was then covered and capped and the site reinstated. There has been no discharge of refuse to the landfill since 2006.

A third party currently holds a consent to discharge chromated copper arsenate (CCA) contaminated soil from the old Fazackerly timber treatment plant site as base fill to the landfill for re-contouring purposes[3] (under the supervision of SDC). This consent has been exercised.

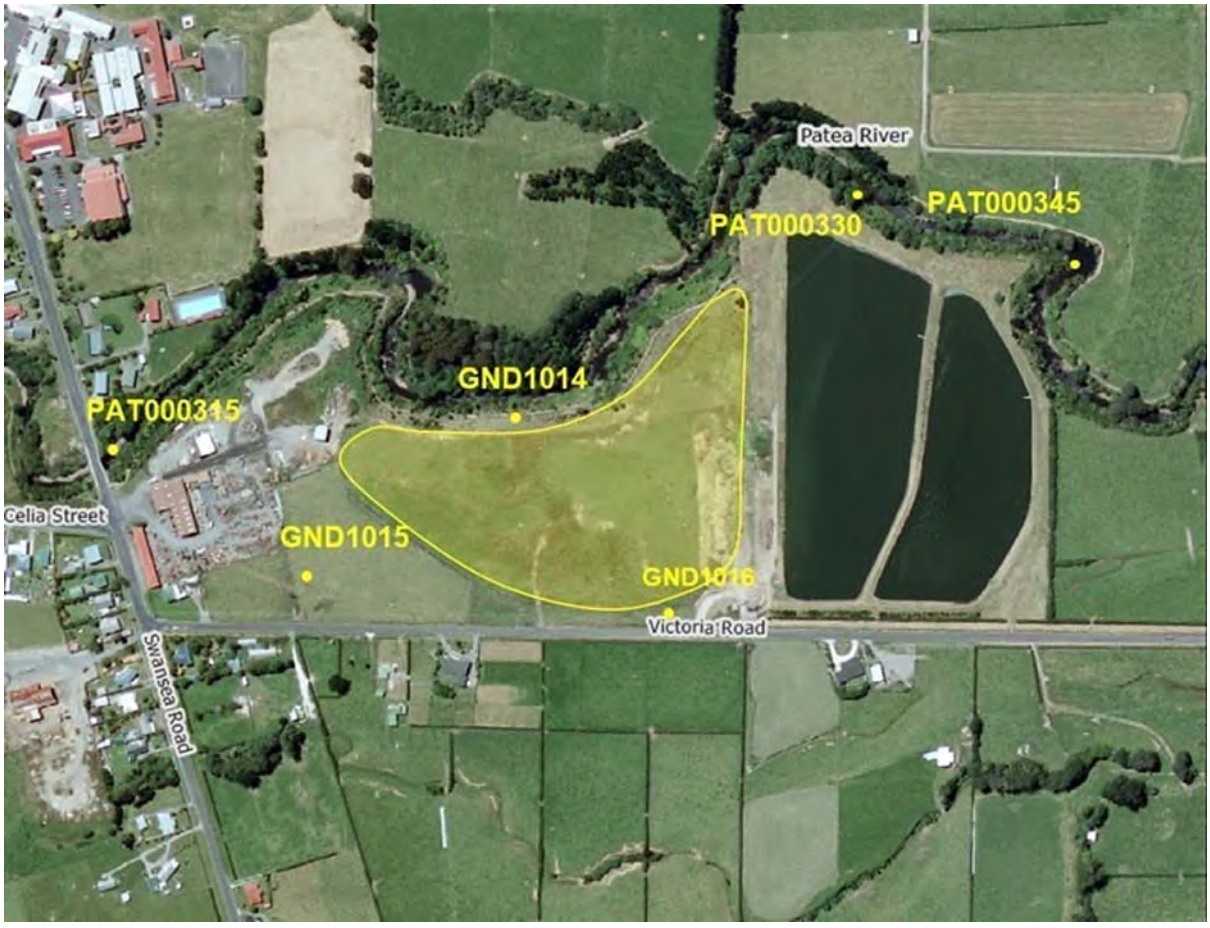


Figure 2 Stratford landfill (shaded in yellow) and sampling locations

[3] This consent was granted to provide for the remediation of a local sawmill site. The consent (7645-1) is held by Alby M Limited, and compliance monitoring of consent 7645-1 is not included in this report

2.2 Results

2.2.1 Inspections

21 September 2022

It was raining with a light breeze at the time of the inspection. The cap was in good condition and was showing no signs of slumping. There was some ponding present, but the inspection was during a rain event, thus this would be expected. There was evidence of good stock rotation and no evidence of damage to the cap. There were no cattle visible during the inspection. The perimeter drains contained flowing water that was clear. Some surface water was present in the drain near the flume shed, but this was not discharging towards the Pātea River.

30 March 2023

The site was inspected in fine weather conditions following a rainfall event the previous day. Generally the overall site was in good condition, however, there was ponding around a central trough and four small areas of soft pugging with minor ponding in the north-eastern area of the site. Those areas generally occurred in slight depressions of the land surface. There was also some soft ground and ponding at the base of the northern batter where the two drainage pipes drain to the Pātea River. The small discharge from those drains was running clear. The above areas were re-inspected on 12 April 2023 with no significant change observed so were regarded as stable. There were no obvious areas of slumping, cracking or exposed landfill material. There was no ambient odour attributable to the landfill. Only light grazing seems to be occurring with four cattle present within the two perimeter fences adjacent to the walkway. New internal (electric capable) fencing had been installed recently. All existing fencing appeared to be in good condition.

2.2.2 Results of groundwater monitoring

Groundwater samples were taken from monitoring bores up slope (GND1015 and GND1016) and down slope (GND1014) of the landfill on two occasions (Figure 2). The results from these samples are shown in Table 2 and Table 3.

Table 2 Results of the Stratford landfill groundwater quality survey, 5 September 2022

Parameter	Unit	GND1014 down-gradient	GND1015 up-gradient	GND1016 up-gradient
pH	pH	6.6	6.2	6.1
Temperature	Deg. C	13.0	11.9	11.7
Depth to water (Level)	M	2.34	2.78	1.34
Alkalinity	g/m^3	340	24	38
Dissolved arsenic	g/m^3	0.0019	<0.0010	<0.0010
Chloride	g/m^3	12.5	7.6	8.1
Chemical oxygen demand (dissolved)	g/m^3	19	< 6	< 6
Conductivity @ 25°C	µS/cm	689	106	114
Dissolved chromium	g/m^3	<0.0005	<0.0005	<0.0005
Dissolved copper	g/m^3	<0.0005	0.063	0.0005
Dissolved reactive phosphorus	g/m^3	0.132	<0.004	<0.004

Parameter	Unit	GND1014 down-gradient	GND1015 up-gradient	GND1016 up-gradient
Unionised ammonia	g/m^3-N	0.022	<0.00001	<0.00001
Ammoniacal nitrogen	g/m^3-N	20	<0.010	<0.010
Nitrate/nitrite nitrogen	g/m^3-N	0.026	1.65	0.37
Dissolved zinc	g/m^3	0.0033	0.0052	0.0062

Table 3 Results of the Stratford landfill groundwater quality survey, 15 February 2023

Parameter	Unit	GND1014 down-gradient	GND1015 up-gradient	GND1016 up-gradient
pH	pH	6.6	6.2	5.9
Temperature	Deg. C	15.5	15.3	16.6
Depth to water (Level)	m	3.53	3.11	1.82
Alkalinity	g/m^3	550	25	42
Dissolved arsenic	g/m^3	<0.0010	<0.0010	<0.0010
Chloride	g/m^3	21	7.0	8.1
Chemical oxygen demand (dissolved)	g/m^3	21	< 6	< 6
Conductivity @ 25°C	µS/cm	1,057	108	135
Dissolved chromium	g/m^3	<0.0005	<0.0005	<0.0005
Dissolved copper	g/m^3	<0.0005	0.041	0.0009
Dissolved reactive phosphorus	g/m^3	0.080	<0.004	<0.004
Unionised ammonia	g/m^3	0.075	<0.000010	<0.000010
Ammoniacal nitrogen	g/m^3-N	51	<0.010	0.013
Nitrate/nitrite nitrogen	g/m^3-N	<0.002	1.85	0.188
Dissolved zinc	g/m^3	0.0047	0.0033	0.0052

As with the results from previous samples taken from these monitoring bores, the groundwater down gradient of the landfill (as represented by bore GND1014), shows some evidence of contamination from the landfill.

Figure 3, Figure 4 and Figure 5 show how bore GND1014 is affected by landfill indicator species namely, ammoniacal nitrogen, chloride and zinc. The graphs also show how the levels of chloride and ammonia are apt to fluctuate against the more stable background levels found in the two bores mid and up gradient from the filled area (more so in the case of chloride and ammoniacal nitrogen). Zinc concentration levels in bore GND1014 over time have reduced in concentration. Chloride concentration levels have also reduced, and this aligns with landfill leachate trends for both parameters with time.

Figure 6 compares the unionised ammonia in the down gradient bore (GND1014) which is most impacted by the landfill due to its location. Given the dependency of unionised ammonia on pH and temperature there is a seasonal variation in ammonia levels which presents as a saw tooth pattern in Figure 6. This makes

it hard to determine an overall trend. Although the unionised ammonia presented in the groundwater is high this doesn't appear to have significantly influenced levels in the surface water which remains well below the 0.025 g/m^3 guideline for the long term protection of aquatic ecosystems.

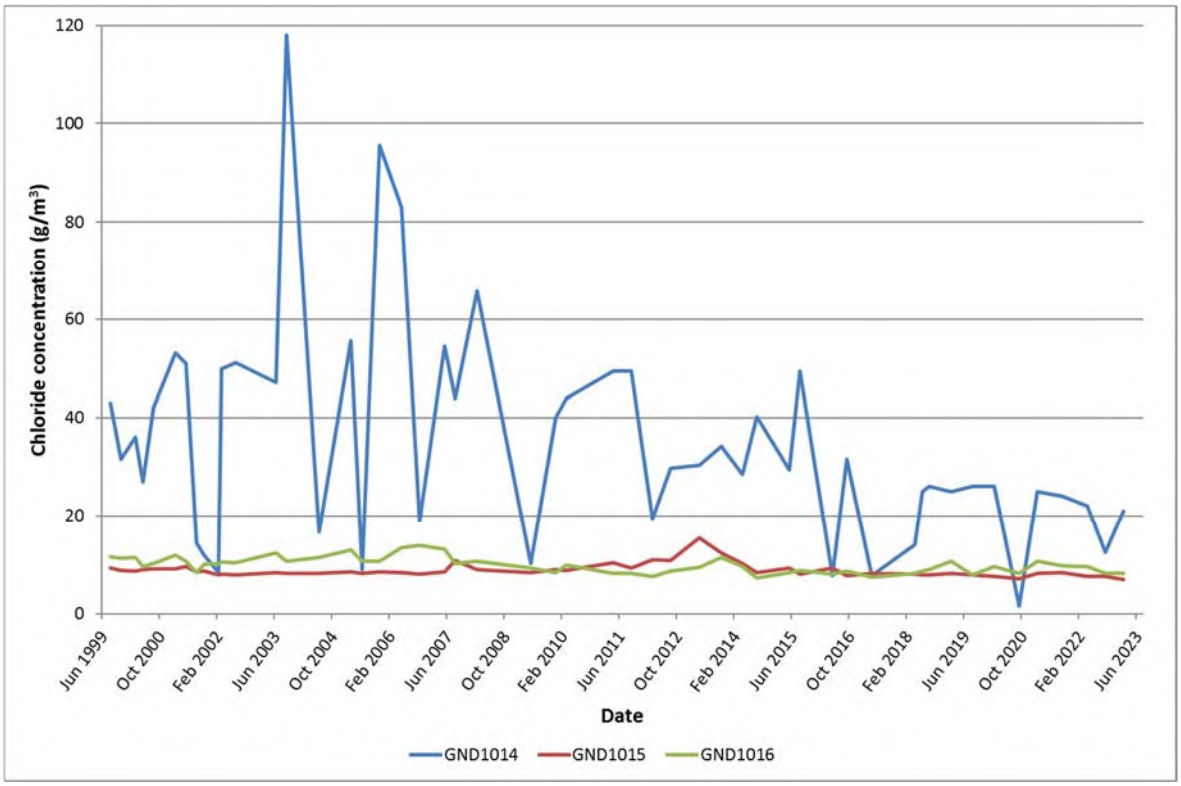


Figure 3 Graph showing chloride levels in the groundwater at the Stratford landfill

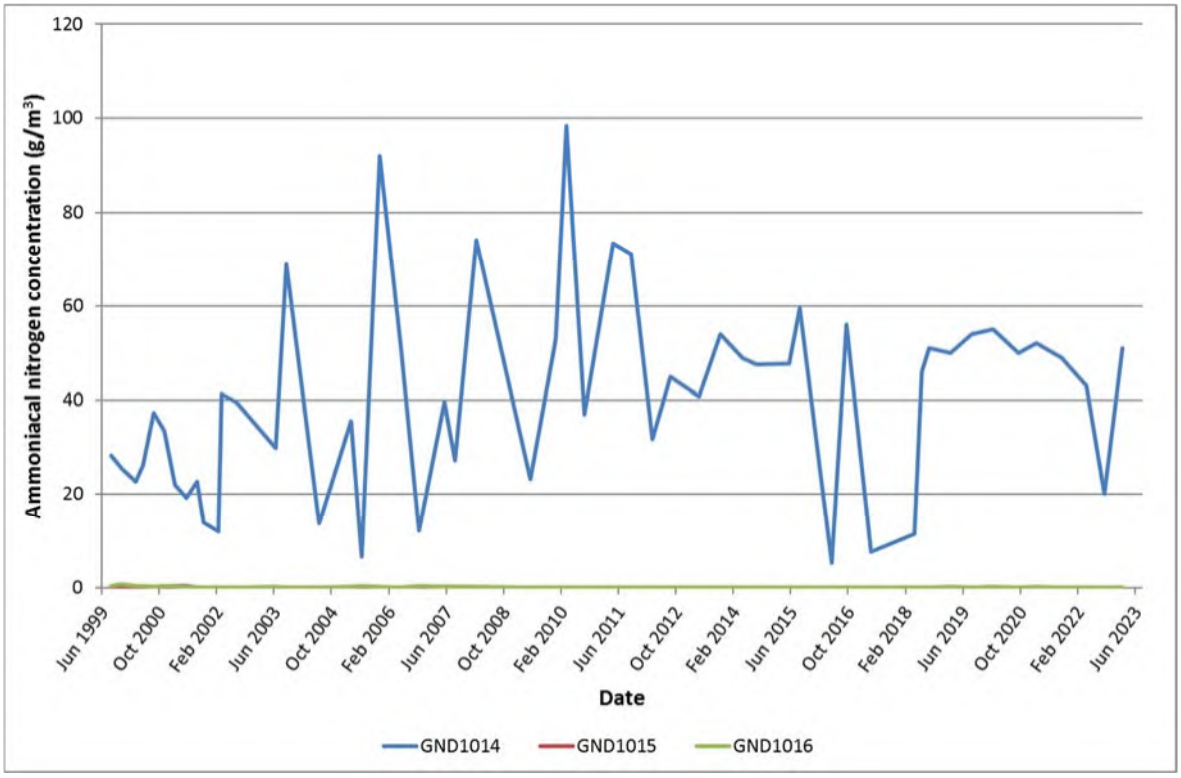


Figure 4 Graph showing ammoniacal nitrogen levels in the groundwater at the Stratford landfill

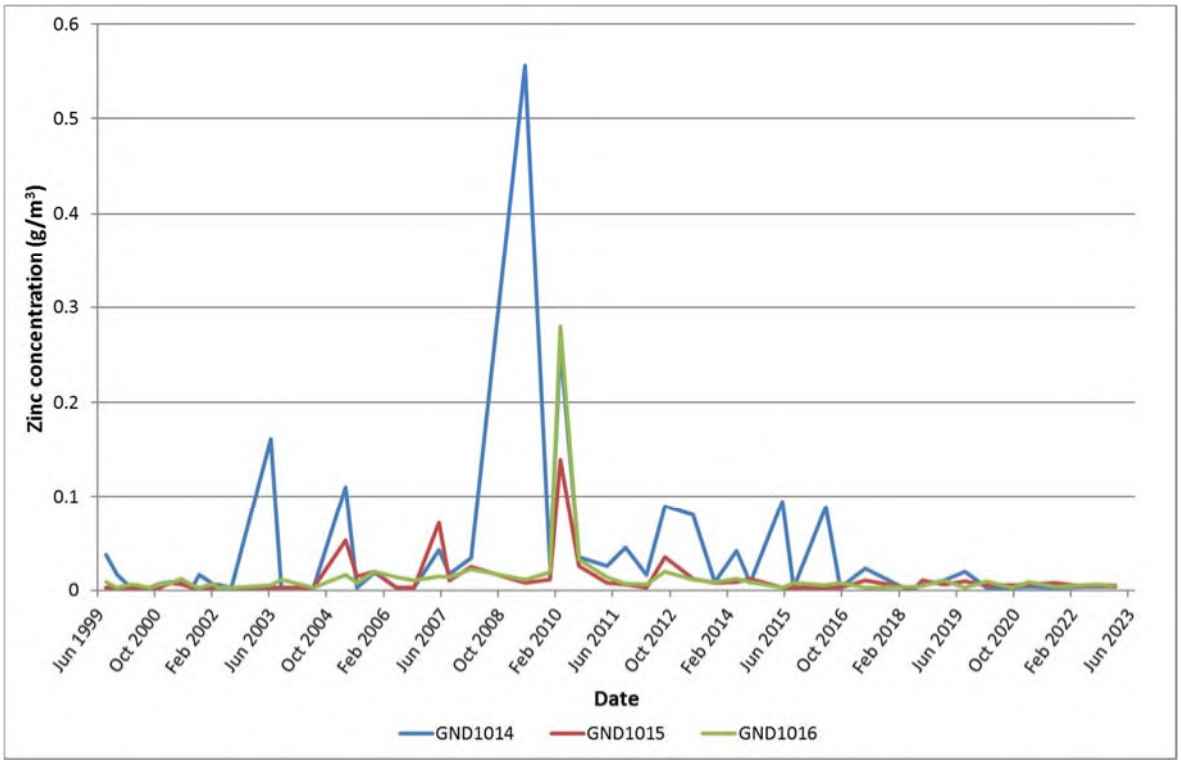


Figure 5 Graph showing dissolved zinc levels in the groundwater at the Stratford landfill

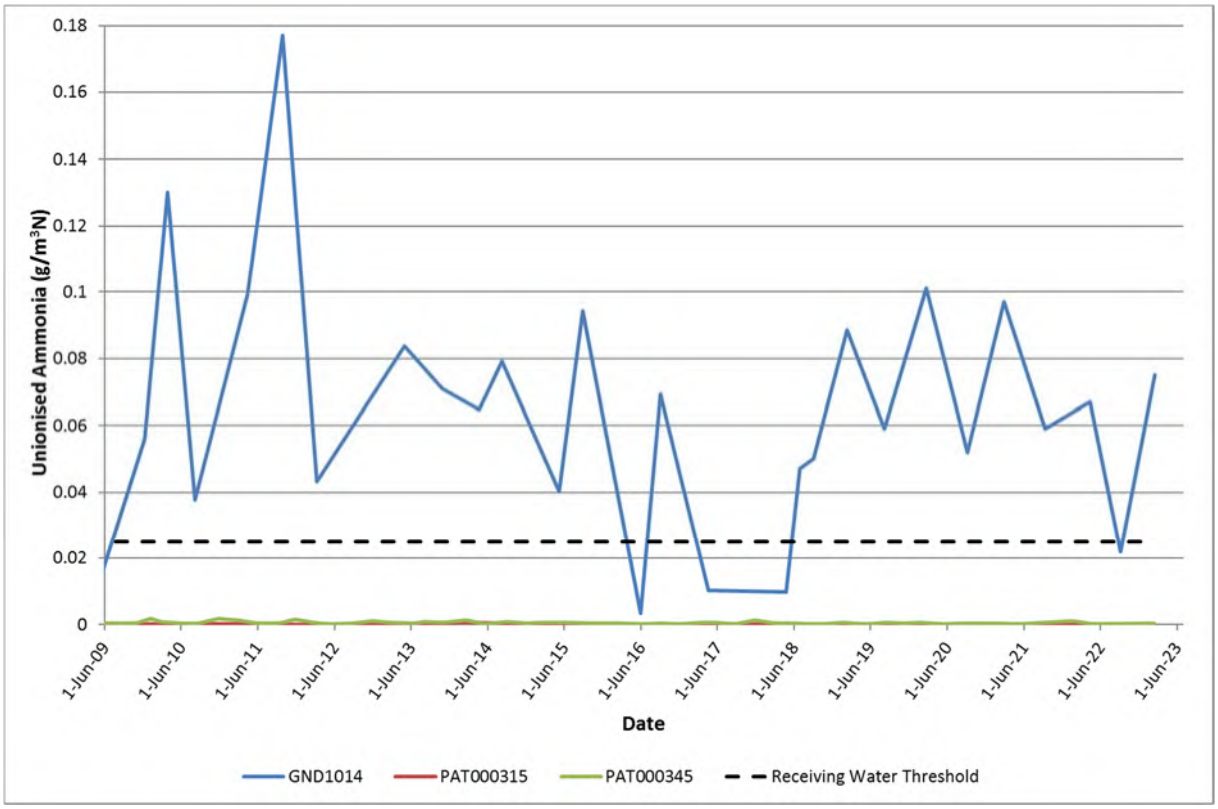


Figure 6 Graph showing unionised ammonia levels in the down gradient bore (GND1014) groundwater and the downstream surface water sites (PAT000315 and PAT000345) at the Stratford landfill

2.2.3 Results of surface water monitoring

Samples were collected from the Pātea River on 13 February 2023 and the results are set out in Table 4. This sampling was undertaken in conjunction with the monitoring of the Stratford WWTP, which is discussed in a separate report.

Table 4 Results of the Stratford landfill water quality survey

Parameter	Units	13 February 2023	
		Above landfill PAT000315	Below landfill and WWTP pond outlet PAT000345
Temperature	Deg.C	14.0	14.2
pH	pH	7.6	7.7
Black disc transparency	m	3.10	2.78
Biochemical oxygen demand	g/m^3	1.0	0.7
Filtered biochemical oxygen demand	g/m^3	< 1.0	< 1.0
Cadmium (dissolved)	g/m^3	<0.00005	<0.00005
Chloride	g/m^3	7.5	7.5
Conductivity @ 25°C	µS/cm	101	103
Chromium (dissolved)	g/m^3	<0.0005	<0.0005
Dissolved oxygen	g/m^3	10.02	10.03
Dissolved reactive phosphorus	g/m^3-P	0.015	0.009
E. coli	MPN/100 ml	517	435
Unionised ammonia	g/m^3	<0.00011	0.00040
Ammoniacal nitrogen	g/m^3-N	<0.010	0.032
Nitrate/nitrite nitrogen	g/m^3-N	0.75	0.75
Total suspended solids	g/m^3	< 3	< 3
Turbidity	FNU	0.64	0.77
Dissolved zinc	g/m^3	0.0017	0.0011

There was no significant difference in the physicochemical water quality between the upstream and downstream sites for the majority of parameters measured. Unionised ammonia and ammoniacal nitrogen increased in a downstream direction. The level of unionised ammonia downstream of the landfill was still well below the 0.025 g/m^3 guideline for the long term protection of aquatic ecosystems.

As with the results from previous monitoring periods, the results from this period indicate that the Stratford landfill had only a very minor, if not negligible, effect on the physicochemical water quality of the Pātea River.

Figure 7 shows the ammoniacal nitrogen data gathered over the past 30 years. It is noted that, as the Stratford WWTP had an upgrade in 2009, the discharge point of the WWTP was moved and the sites used to

monitor the downstream effects of the landfill have also changed. Monitoring at site PAT000330 ceased in March 2009, with monitoring continuing at site PAT000345, further downstream.

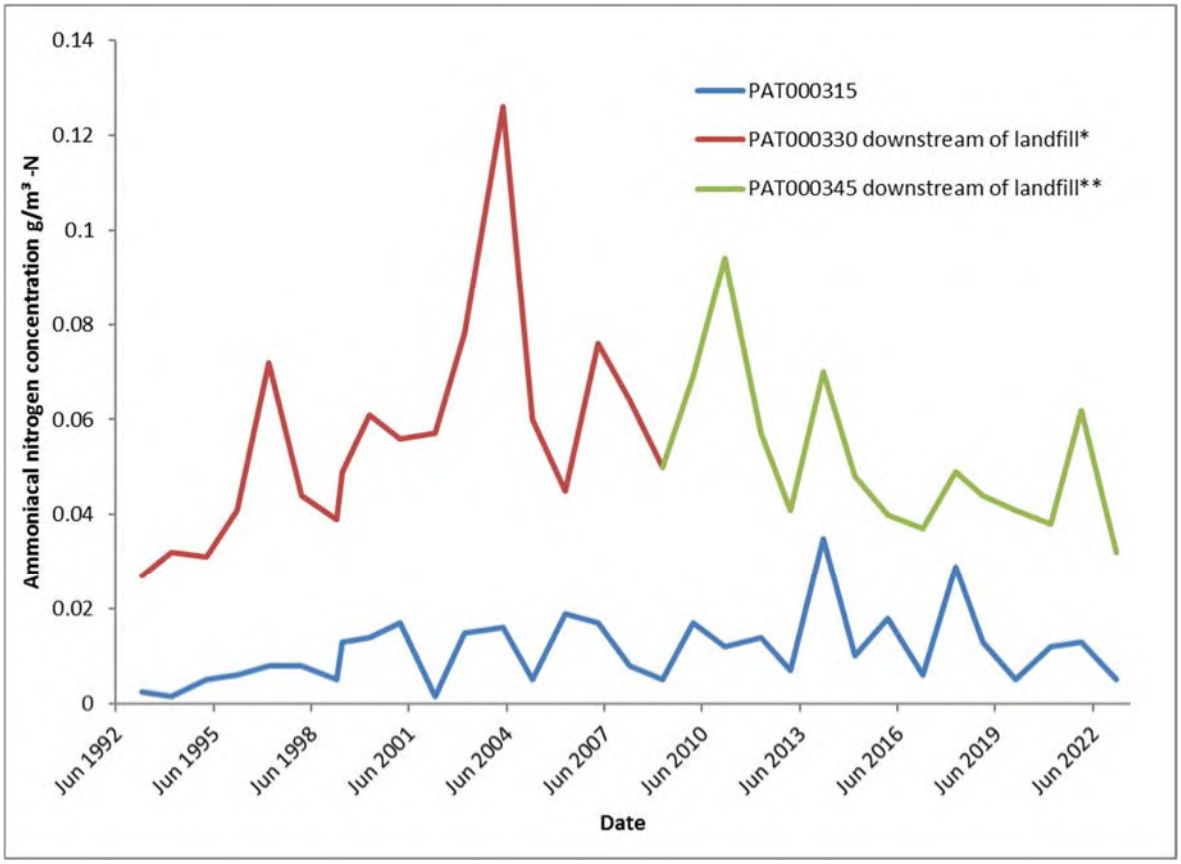


Figure 7 Graph showing ammoniacal nitrogen levels in the Pātea Stream up and downstream of the landfill (where comparative data is available)

**Downstream site prior to WWTP upgrade*
***Downstream site after WWTP upgrade*

Whilst there is some separation between the sites' locations, the graph indicates that a similar, stable, and modest rise in ammoniacal nitrogen has occurred in the Pātea River as result of the landfill's presence.

2.2.4 Biomonitoring

The Council collected streambed macroinvertebrates from the Pātea River on two occasions to investigate the effects of a closed landfill and the Stratford WWTP discharge on macroinvertebrate health. The different types of macroinvertebrate from samples were identified and the number of different types (taxa richness), MCI score, and SQMCI score were calculated for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of nutrient pollution in streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to pollution. The SQMCI takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities. Significant differences in either the MCI or the SQMCI between sites indicate the degree of adverse effects (if any) of the discharges being monitored and enable the overall health of the macroinvertebrate communities to be determined.

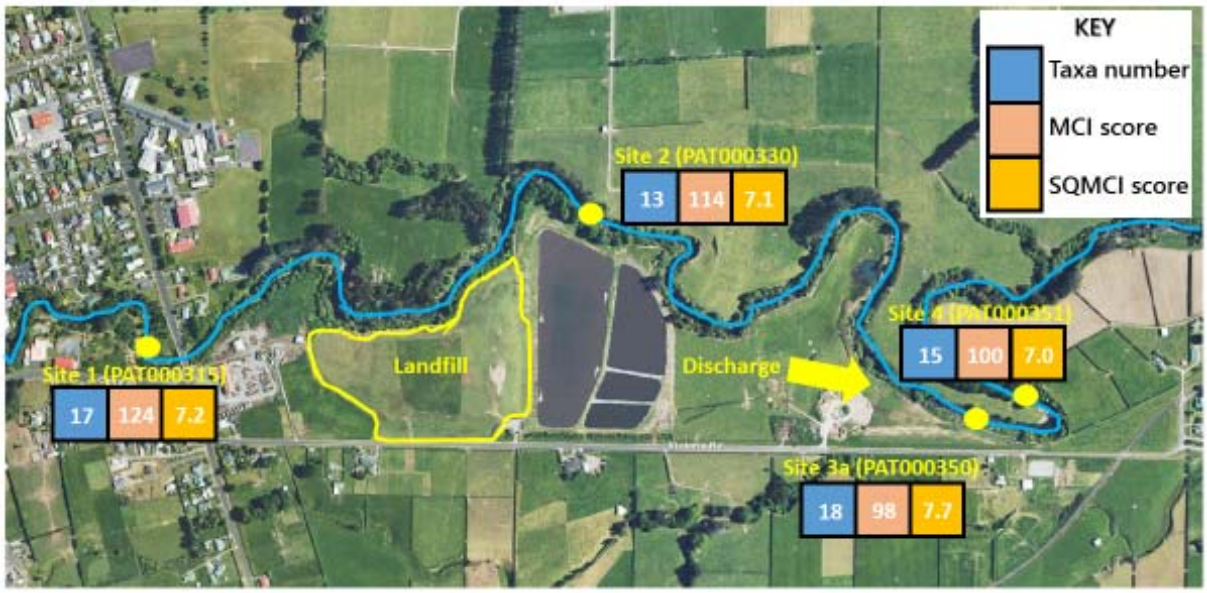
Table 5 Location of sampling sites in the Pātea River

Site No	Site code	Grid reference	Location
1	PAT000315	E1711801 N5644382	Swansea Road bridge (upstream of landfill and oxidation ponds' discharge)
2	PAT000330	E1712403 N5644580	150 m u/s Stratford oxidation ponds' discharge
3a	PAT000350	E1712956 N5644292	Approximately 130 m downstream of the WWTP new outfall
4	PAT000351	E1713032 N5644330	340 m downstream of new Stratford WWTP discharge

9 December 2022

The Pātea River sites had a low to moderate macroinvertebrate community richness. Compared to the previous survey results, taxa richness stayed the same at site 1 but decreased by seven, seven and four taxa at sites 2, 3a and 4, respectively. Taxa richness was lower than historical medians at all sites, with eight, 10, five and six taxa difference at sites 1, 2, 3a and 4, respectively.

Figure 8 Biomonitoring sites with taxa number, MCI and SQMCI scores for each site, December 2022



MCI scores categorised site 1 as having 'very good' macroinvertebrate community health, while sites 2 and 4 scored 'good' health and site 3 was categorised as having 'fair' health. There was no significant difference between the 'control' site (site 1) and site 2, but sites 3a and 4 recorded a significantly lower MCI score compared to the 'control' site. The similarity in MCI score between sites 1 and 2 indicate that the closed landfill was not influencing the macroinvertebrate community. However, the discharge from the wastewater treatment plant appears to have influenced the taxonomic composition at site 3a, leading to the lowest observed MCI score in this survey. This deterioration was still evident at site 4. In comparison to the previous survey, all sites recorded somewhat similar results. While current MCI scores were similar to the historic site medians at sites 2, 3a and 4 (between one to seven units difference), the MCI score at the 'control' site (site 1) was 15 units higher compared to the sites historic median. It is worth noting that although this survey recorded a deterioration in MCI score at sites 3 and 4, this deterioration was not because sites 3 and 4 were in poorer than typical health, but because site 1 was in above average health.

The SQMCI scores were reflective of 'excellent' macroinvertebrate community health at all four sites, with no significant difference between sites. The SQMCI scores recorded during this survey were higher than previous scores at sites 2, 3a and 4, with site 4 seeing a significant increase. The SQMCI score at site 1

remained unchanged. These scores were also significantly higher than respective site historic medians at sites 3a and 4. These results suggest that neither the closed landfill nor the WWTP discharge had a notable negative impact on the taxa that dominate the macroinvertebrate community at any of the surveyed sites.

According to the MCI scores, there was no apparent decline in macroinvertebrate community health between sites 1 and 2. There was a decline between sites 2 and 3a, which was maintained at site 4. There was also a reduction in EPT taxa in a downstream direction. It is likely that this decline can be attributed to the WWTP discharge. However, as all sites recorded 'excellent' SQMCI scores, this decline is considered as subtle, and did not significantly alter the main composition of the macroinvertebrate community. Overall, the results of the survey indicate that the closed landfill did not have a significant negative effect on the macroinvertebrate community health of the Pātea River.

28 February 2023

The Pātea River sites had moderate macroinvertebrate community richness. Compared to the previous survey results, taxa richness increased by five, five, six and seven taxa at sites 1, 2, 3a and 4, respectively. Taxa richness was lower than historical medians at sites 1 and 2, being three taxa less at site 1 and five taxa less at site 2. Taxa richness was higher than historical medians at sites 3a and 4, with one taxa difference at both sites.

MCI scores categorised all sites as having 'good' macroinvertebrate community health, with no significant differences between any of the sites. In comparison to the previous survey, sites 2, 3a and 4 scored two, 10 and six units higher, respectively; while site 1 scored nine units lower. Current MCI scores across all sites were similar to the historic site medians at sites, with differences between four to eight units.

The SQMCI scores were reflective of 'excellent' macroinvertebrate community health at sites 1 and 2, and 'good' health at sites 3a and 4, indicating a significant difference between the two upstream sites (1 and 2) and two downstream sites (3a and 4). The SQMCI scores recorded during this survey were similar to the previous scores at sites 1 and 2, but significantly lower at sites 3a and 4. However, all current SQMCI scores were higher than respective site historic medians.

As there was little difference in MCI and SQMCI scores between sites 1 and 2, it was apparent that the closed landfill was not impacting on the macroinvertebrate community health at site 2. Downstream of site 2, there is a slight reduction in MCI score, and a significant reduction in SQMCI score. This indicates that the community downstream of the WWTP discharge was in poorer condition than upstream, but when the main composition of the community is considered (especially EPT taxa), this reduction is not considered to be ecologically significant. Overall, these results suggests that the closed landfill and WWTP discharges did not have a significant negative effect on the macroinvertebrate community health of the Pātea River.

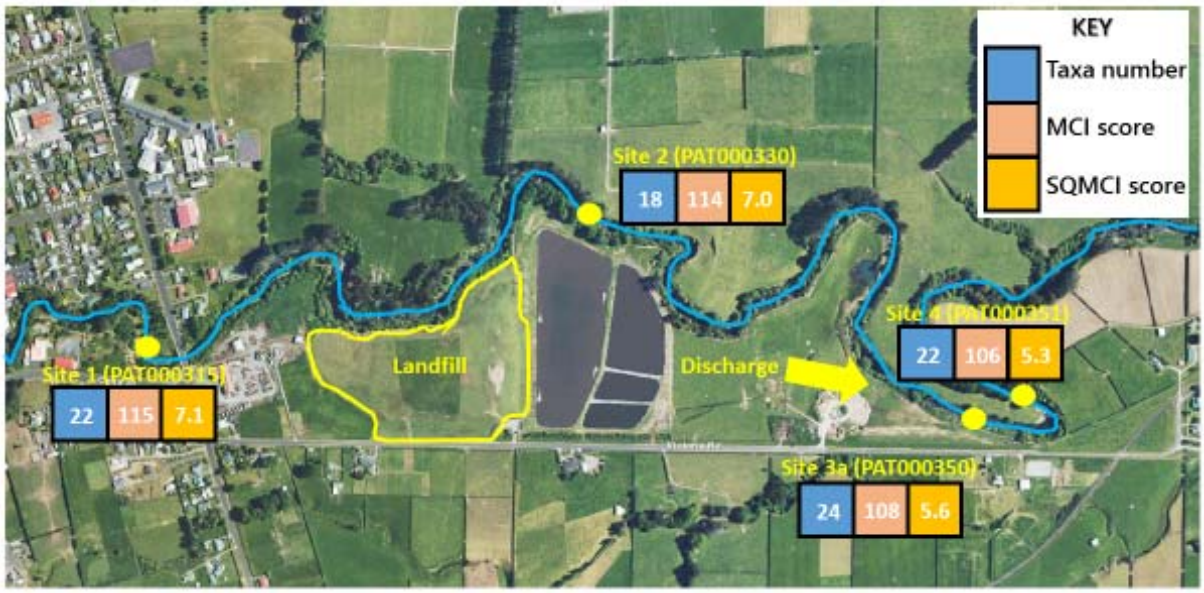


Figure 9 Biomonitoring sites with taxa number, MCI and SQMCI scores for each site, February 2023

Copies of biomonitoring reports for this site are available from the Council upon request.

2.2.4 Incidents, investigations, and interventions

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the SDC. During the year matters may arise which require additional activity by the Council, for example provision of advice and information, or investigation of potential or actual causes of non-compliance or failure to maintain good practices. A pro-active approach, that in the first instance avoids issues occurring, is favoured.

For all significant compliance issues, as well as complaints from the public, the Council maintains a database record. The record includes events where the individual/organisation concerned has itself notified the Council. Details of any investigation and corrective action taken are recorded for non-compliant events.

Complaints may be alleged to be associated with a particular site. If there is potentially an issue of legal liability, the Council must be able to prove by investigation that the identified individual/organisation is indeed the source of the incident (or that the allegation cannot be proven).

In the 2022-2023 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with SDC's conditions in resource consents or provisions in Regional Plans.

2.3 Discussion

2.3.1 Discussion of site performance

SDC displayed a high level of site performance at Stratford closed landfill during the 2022-2023 monitoring year. Site inspections showed the cap was well grassed with no signs of slumping, cracking or exposed refuse. All fences and troughs were intact and well maintained. No non-compliances were noted. Small areas of ponding were found at both inspections, which were during or following rainfall events. These were not considered to be non-compliant at the time of inspection, however, SDC should continue to monitor this to ensure on-going compliance.

2.3.2 Environmental effects of exercise of consents

Groundwater bore GND1014 continued to exhibit some signs of contamination, however surface water sampling and biomonitoring indicated that the closed landfill was not having a significant effect on the Pātea River during the year under review. There was no evidence of odour or dust problems at the site during any inspection.

Biomonitoring results indicated that overall the closed landfill did not have a significant effect on the macroinvertebrate community health.

2.3.3 Evaluation of performance

A tabular summary of SDC's compliance record for the year under review in regard to the Stratford landfill is set out in Table 6.

Table 6 Summary of performance for consent 3889-3 (Stratford landfill)

Purpose: ***To discharge leachate into land and into groundwater adjacent to the Pātea River***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practical option	Inspections and liaison with consent holder	Yes
2. Prepare a Contingency and Maintenance Plan	Revised plan received May 2018	Yes
3. Maintain landfill site	Inspection	Yes
4. Effects beyond mixing zone	Water quality and biomonitoring of the Pātea River upstream and downstream of the landfill	Yes
5. Optional review	No further option for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

Table 7 Evaluation of environmental performance over time-Stratford landfill

Year	Consent no	High	Good	Improvement req	Poor
2010-2011	3889-3	-	1	-	-
2011-2012	3889-3	-	1	-	-
2012-2013	3889-3	1	-	-	-
2013-2014	3889-3	1	-	-	-
2014-2015	3889-3	1	-	-	-
2015-2016	3889-3	1	-	-	-
2016-2017	3889-3	1	-	-	-
2017-2018	3889-3	-	-	1	-
2018-2019	3889-3	-	1	-	-
2019-2020	3889-3	1	-	-	-
2021-2022	3889-3	1	-	-	-

Year	Consent no	High	Good	Improvement req	Poor
2022-2023	3889-3	1	-	-	-
Totals		8	3	1	0

During the year, SDC demonstrated a high level of environmental and high level of administrative performance with the resource consents as defined in Appendix II.

2.3.4 Recommendations from the 2021-2022 Annual Report

In the 2021-2022 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at Stratford Landfill in the 2022-2023 year continue at the same level as in 2021-2022.
2. THAT should there be issues with environmental or administrative performance in 2022-2023, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

Recommendation one was implemented, while additional investigation or monitoring was not considered necessary as per recommendation two.

2.3.5 Alterations to monitoring programmes for 2023-2024

In designing and implementing the monitoring programmes for air/water discharges in the region, the Council has taken into account:

- the extent of information already made available through monitoring or other means to date;
- its relevance under the RMA;
- the Council's obligations to monitor consented activities and their effects under the RMA;
- the record of administrative and environmental performances of the consent holder; and
- reporting to the regional community.

The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki exercising resource consents.

No planned changes have been made to the 2023-2024 monitoring programme.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the sites in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2023-2024.

2.4 Recommendations

1. THAT in the first instance, monitoring of consented activities at Stratford Landfill in the 2023-2024 year continue at the same level as in 2022-2023.
2. THAT should there be issues with environmental or administrative performance in 2023-2024, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

3 Huiroa landfill

3.1 Process description

The Huiroa landfill is sited within an elbow of Douglas Road. The dump was an uncontrolled roadside landfill used by local residents to dispose of domestic waste. The site was closed in 1991 and reinstated by SDC.

This closed landfill is monitored on a triennial basis, with inspections and sampling undertaken during 2020-2021 and next scheduled in 2023-2024. The location of the landfill and monitoring sites are shown in Figure 10.

Figure 10 Huiroa landfill and approximate sampling locations

3.2 Results

The closed landfill at Huiroa is monitored on a triennial basis. Monitoring is next scheduled for the 2023-2024 year. No inspections or sampling were undertaken during the year under review.

3.2.1 Investigations, interventions, and incidents

In the 2022-2023 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with SDC's conditions in the Huiroa landfill resource consents or provisions in Regional Plans.

3.3 Discussion

3.3.1 Evaluation of performance

A tabular summary of SDC's compliance record for the Huiroa landfill during the period under review is set out in Table 8.

Table 8 Summary of performance for consent 3890-3 (Huiroa closed landfill)

Purpose: ***To discharge stormwater and leachate from the former Huiroa landfill onto and into land in the vicinity of an unnamed tributary of the Makuri Stream***		
Condition requirement	**Condition requirement**	**Condition requirement**
1. Adoption of best practicable option	Inspection and liaison with consent holder	N/A
2. Maintenance of cap and drainage systems	Inspection	N/A
3. Site to be operated in accordance with a Management Plan	Inspection and liaison with consent holder	N/A
4. Component concentration limits on water quality after mixing	Water sampling	N/A
5. General water quality after mixing	Water sampling and inspection	N/A
6. Optional review	Next opportunity for review June 2028	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**N/A**
Overall assessment of administrative performance in respect of this consent		**N/A**

N/A = not applicable

Table 9 Evaluation of environmental performance over time - Huiroa landfill

Year	Consent no	High	Good	Improvement req	Poor
2012	3890-2	1	-	-	-
2015	3890-2	-	1	-	-
2018	3890-3	1	-	-	-
2021	3890-3	1			
Totals		3	1	-	-

During the year, the environmental and administrative performance of SDC was not assessed in relation to the Huiroa landfill resource consent.

3.3.2 Recommendations from the 2021-2022 Annual Report

In the 2021-2022 Annual Report, it was recommended:

1. THAT in the first instance, the triennial monitoring for the Huiroa landfill remains unchanged in the 2022-2023 year, continuing at the same level, with monitoring next undertaken in 2023-2024.
2. THAT should there be issues with environmental or administrative performance in 2022-2023, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

Recommendation one was implemented, while additional investigation or monitoring was not considered necessary as per recommendation two.

3.3.3 Alterations to monitoring programmes for 2023-2024

In designing and implementing the monitoring programmes for air and water discharges in the region, the Council has taken into account:

- the extent of information already made available through monitoring or other means to date;
- its relevance under the RMA;
- the Council's obligations to monitor consented activities and their effects under the RMA;
- the record of administrative and environmental performances of the consent holder; and
- reporting to the regional community.

The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki exercising resource consents.

No planned changes have been made to the 2023-2024 monitoring programme. However it is noted that with the triennial monitoring of the site, this is scheduled to be undertaken in the 2023-2024 year.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2023-2024.

3.4 Recommendations

1. THAT in the first instance, the triennial monitoring for the Huiroa landfill remains unchanged with monitoring scheduled to be undertaken in 2023-2024.
2. THAT should there be issues with environmental or administrative performance in 2023-2024, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

4 Pukengahu landfill

4.1 Process description

The site is situated in a small gully off Wingrove Road (Figure 11). At the base of the gully is a small wetland area, which is fed by a spring that is culverted beneath the road and feeds into a small unnamed stream. The site was unmanaged and was mostly used for the discharge of domestic waste by local residents. The landfill closed in 1991 and was reinstated by SDC. It is monitored on a triennial basis, with inspections and sampling undertaken during the 2020-2021 monitoring year, and next scheduled in 2023-2024.

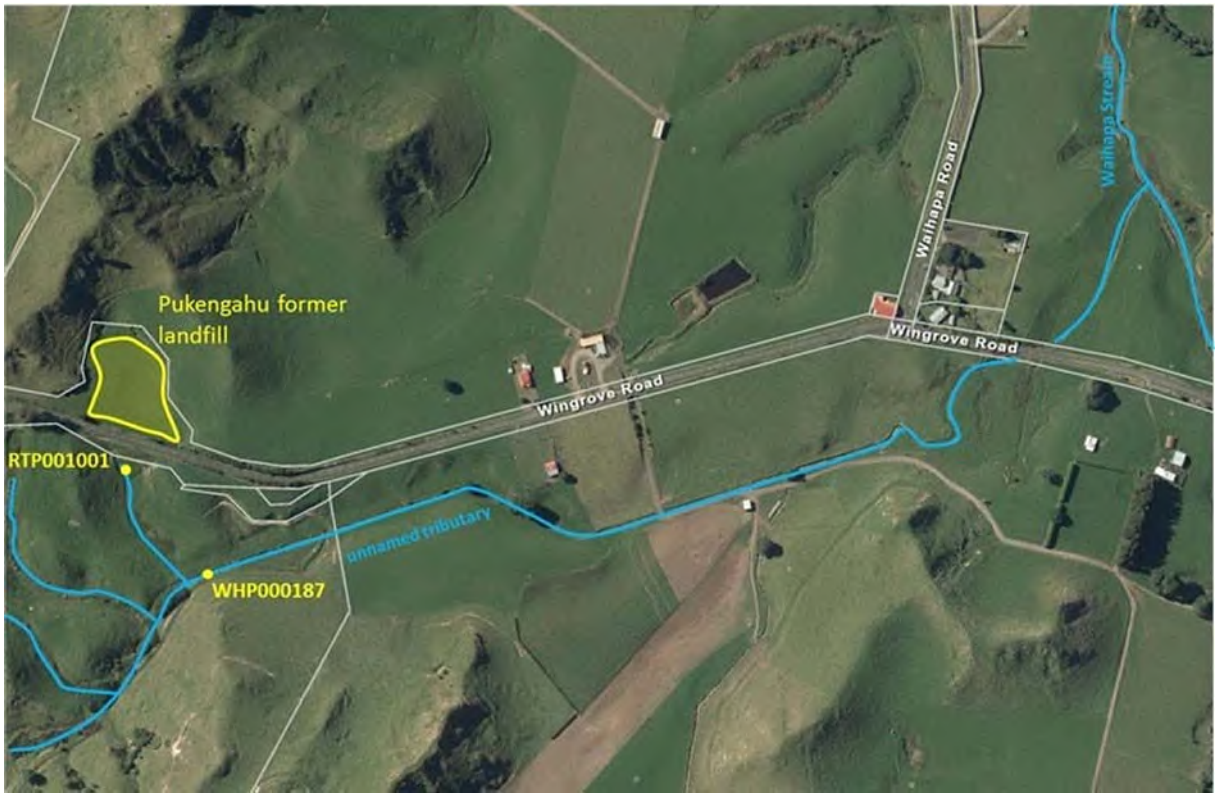


Figure 11 Pukengahu landfill and approximate sampling locations

4.2 Results

The closed landfill at Pukengahu is monitored on a triennial basis. Monitoring is next scheduled during the 2023-2024 year. No inspections or sampling were undertaken during the year under review.

4.2.1 Investigations, interventions, and incidents

In the 2022-2023 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with SDC's conditions in the Pukengahu landfill resource consents or provisions in Regional Plans.

4.3 Discussion

4.3.1 Evaluation of performance

A tabular summary of SDC's compliance record for the Pukengahu landfill during the period under review is set out in Table 10.

Table 10 Summary of performance for Consent 3891-3 (Pukengahu closed landfill)

Purpose: ***To discharge stormwater and leachate from the former Pukengahu landfill into an unnamed tributary of the Waihapa Stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adoption of best practicable option	Inspection and liaison with consent holder	N/A
2. Maintenance of cap and drainage systems	Inspection	N/A
3. Site to be operated in accordance with a Management Plan	Inspection and liaison with consent holder	N/A
4. Component concentration limits on water quality after mixing	Water sampling	N/A
5. General water quality after mixing	Water sampling and inspection	N/A
6. Optional review	Next opportunity for review June 2028	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**N/A**
Overall assessment of administrative performance in respect of this consent		**N/A**

N/A = not applicable

Table 11 Evaluation of environmental performance over time - Pukengahu landfill

Year	Consent no	High	Good	Improvement req	Poor
2012	3891-2	1	-	-	-
2015	3891-2	1	-	-	-
2018	3891-3	1	-	-	-
2021	3891-3	1	-	-	-
Totals		4	-	-	-

During the year, the environmental and administrative performance of SDC was not assessed in relation to the Pukengahu landfill resource consent.

4.3.2 Recommendations from the 2021-2022 Annual Report

In the 2021-2022 Annual Report, it was recommended:

1. THAT in the first instance, the triennial monitoring for the Pukengahu landfill remains unchanged in the 2021-2022 year, continuing at the same level, with monitoring next undertaken in 2023-2024.
2. THAT should there be issues with environmental or administrative performance in 2023-2024, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

Recommendation one was implemented, while additional investigation or monitoring was not considered necessary as per recommendation two.

4.3.3 Alterations to monitoring programmes for 2023-2024

In designing and implementing the monitoring programmes for air and water discharges in the region, the Council has taken into account:

- the extent of information already made available through monitoring or other means to date;
- its relevance under the RMA;
- the Council's obligations to monitor consented activities and their effects under the RMA;
- the record of administrative and environmental performances of the consent holder; and
- reporting to the regional community.

The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki exercising resource consents.

No planned changes have been made to the 2022-2023 monitoring programme. However it is noted that with the triennial monitoring of the site, this is scheduled to be undertaken in the 2023-2024 year

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2022-2023.

4.4 Recommendations

1. THAT in the first instance, the triennial monitoring for the Pukengahu landfill remains unchanged, with monitoring next scheduled to be undertaken in 2023-2024.
2. THAT should there be issues with environmental or administrative performance in 2023-2024, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

Glossary of common terms and abbreviations

The following abbreviations and terms may be used within this report:

Al*	Aluminium.
As*	Arsenic.
Biomonitoring	Assessing the health of the environment using aquatic organisms.
BOD	Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate.
BODF	Biochemical oxygen demand of a filtered sample.
Bund	A wall around a tank to contain its contents in the case of a leak.
CBOD	Carbonaceous biochemical oxygen demand. A measure of the presence of degradable organic matter, excluding the biological conversion of ammonia to nitrate.
cfu	Colony forming units. A measure of the concentration of bacteria usually expressed as per 100 millilitre sample.
COD	Chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction.
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 25°C and expressed in µS/cm.
Cu*	Copper.
Cumec	A volumetric measure of flow- 1 cubic metre per second (1 m^3s^{-1}).
DO	Dissolved oxygen.
DRP	Dissolved reactive phosphorus.
E.coli	Escherichia coli, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample.
Ent	Enterococci, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre of sample.
F	Fluoride.
FC	Faecal coliforms, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample.
Fresh	Elevated flow in a stream, such as after heavy rainfall.
$g/m^2/day$	Grams/$metre^2$/day.
g/m^3	Grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.
Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.

Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident.
Incident register	The incident register contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan.
L/s	Litres per second.
m^2	Square Metres.
MCI	Macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity of the taxa present to organic pollution in stony habitats.
Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point.
MPN	Most Probable Number. A method used to estimate the concentration of viable microorganisms in a sample.
µS/cm	Microsiemens per centimetre.
NH_4	Ammonium, normally expressed in terms of the mass of nitrogen (N).
NH_3	Unionised ammonia, normally expressed in terms of the mass of nitrogen (N).
NO_3	Nitrate, normally expressed in terms of the mass of nitrogen (N).
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water.
O&G	Oil and grease, defined as anything that will dissolve into a particular organic solvent (e.g. hexane). May include both animal material (fats) and mineral matter (hydrocarbons).
Pb*	Lead.
pH	A numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5.
Physicochemical	Measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment.
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).
RMA	*Resource Management Act 1991* and including all subsequent amendments.
SS	Suspended solids.
SQMCI	Semi quantitative macroinvertebrate community index.
Temp	Temperature, measured in °C (degrees Celsius).
Turb	Turbidity, expressed in NTU.
Zn*	Zinc.

*an abbreviation for a metal or other analyte may be followed by the letters 'As', to denote the amount of metal recoverable in acidic conditions. This is taken as indicating the total amount of metal that might be solubilised under extreme environmental conditions. The abbreviation may alternatively be followed by the

letter 'D', denoting the amount of the metal present in dissolved form rather than in particulate or solid form.

For further information on analytical methods, contact an Environmental Quality Manager.

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Appendix I

Resource consents held by Stratford District Council

(For a copy of the signed resource consent
please contact the TRC Consents department)

Water abstraction permits

Section 14 of the RMA stipulates that no person may take, use, dam or divert any water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or it falls within some particular categories set out in Section 14. Permits authorising the abstraction of water are issued by the Council under Section 87(d) of the RMA.

Water discharge permits

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations. Permits authorising discharges to water are issued by the Council under Section 87(e) of the RMA.

Air discharge permits

Section 15(1)(c) of the RMA stipulates that no person may discharge any contaminant from any industrial or trade premises into air, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising discharges to air are issued by the Council under Section 87(e) of the RMA.

Discharges of wastes to land

Sections 15(1)(b) and (d) of the RMA stipulate that no person may discharge any contaminant onto land if it may then enter water, or from any industrial or trade premises onto land under any circumstances, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising the discharge of wastes to land are issued by the Council under Section 87(e) of the RMA.

Land use permits

Section 13(1)(a) of the RMA stipulates that no person may in relation to the bed of any lake or river use, erect, reconstruct, place, alter, extend, remove, or demolish any structure or part of any structure in, on, under, or over the bed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Land use permits are issued by the Council under Section 87(a) of the RMA.

Coastal permits

Section 12(1)(b) of the RMA stipulates that no person may erect, reconstruct, place, alter, extend, remove, or demolish any structure that is fixed in, on, under, or over any foreshore or seabed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Coastal permits are issued by the Council under Section 87(c) of the RMA.

Discharge Permit

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	Stratford District Council P O Box 320 STRATFORD 4352
Decision Date:	6 December 2010
Commencement Date:	6 December 2010

Conditions of Consent

Consent Granted:	To discharge leachate into land and into groundwater adjacent to the Patea River at or about (NZTM) 1712119E-5644346N
Expiry Date:	1 June 2028
Review Date(s):	June 2016, June 2022
Site Location:	Swansea Road, Stratford
Legal Description:	Lots 5-6 DP Pt Lot 4 DP 1942 Lot 2 DP 11213 Blk II Ngaere SD [Discharge source & site]
Catchment:	Patea

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General condition

a. The consent holder shall pay to the Taranaki Regional Council [the Council] all the administration, monitoring and supervision costs of this consent, fixed in accordance to section 36 of the Resource Management Act.

Special conditions

1. The consent holder shall at all time adopt the best practical option as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.

2. Before 31 March 2011 the consent holder shall submit a Landfill Maintenance and Contingency Plan to the satisfaction to the Chief Executive of the Taranaki Regional Council that;

    a) sets out the requirements and scheduling for the maintenance of the landfill cap;

    b) identifies all other structures on the site [drains, stock watering troughs, and groundwater bores etc] that require ongoing maintenance and sets out requirements and scheduling for their maintenance;

    c) outlines the proposed responses to inadvertent exposure of refuse, significant cap disturbance, and leachate breakouts; and

    d) provides a list of contact details for all appropriate staff and agencies to be contacted during an emergency at the site.

3. In addition to adhering to the Landfill Maintenance and Contingency Plan as required by condition 2, the consent holder shall at all times take all reasonable steps to ensure;

    a) that the cap is contoured is maintained in a manner that prevents ponding, stormwater infiltration and minimises leachate production;

    b) that the cap retains a reasonable cover of appropriate vegetation;

    c) that any stock water troughs on the site are maintained to ensure that they do not leak or overflow;

    d) that any existing drains or other diversion structures are kept clear and functional; and

    e) that the cap depth is maintained to the original specifications as set out in the Swansea Street Sanitary Landfill Management Plan of 1992.

4. That downstream of the discharge zone in the Patea River , beyond grid reference 1712256E-5644543N, the discharge shall not give rise to any of the following effects in the receiving waters of the Patea River:

   a) the production of any conspicuous oil or grease films, scums or foams or floatable or suspended materials;
   b) any conspicuous change in colour or visual clarity;
   c) any emission of objectionable odour;
   d) the rendering of fresh water unsuitable for consumption by farm animals;
   e) any significant effects of aquatic life.

5. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2016 and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 6 December 2010

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	Stratford District Council PO Box 320 Stratford 4352
Decision Date:	16 June 2016
Commencement Date:	16 June 2016

Conditions of Consent

Consent Granted:	To discharge stormwater and leachate from the former Huiroa landfill onto and into land in the vicinity of an unnamed tributary of the Makuri Stream
Expiry Date:	1 June 2034
Review Date(s):	June 2022, June 2028
Site Location:	Huiroa Landfill, Douglas Road, Huiroa
Grid Reference (NZTM)	1726881E-5653373N
Catchment:	Patea
Tributary:	Makuri

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General condition

a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The landfill cap and stormwater and leachate drainage systems shall be maintained in a manner that:

   a) minimises stormwater infiltration into the filled area; and
   b) ensures stormwater is adequately diverted and/or drained away from the landfill cap.

3. The site shall be operated in accordance with a 'Management Plan' prepared by the consent holder within 3 months of granting of this consent, and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site will be managed to achieve compliance with the conditions of this consent and shall include but not be limited to:

   a) specifying the consent holders monitoring schedule for the site;
   b) maintenance of the landfill cap to minimise ponding and stormwater infiltration;
   c) maintenance and management of the stormwater drains on and around the landfill to ensure stormwater is adequately diverted and/or drained away from the landfill cap.

4. After reasonable mixing the receiving waters of the unnamed tributary of the Makuri Stream downstream of the discharge shall meet the following standards:

   a) unionised ammonia concentration less than 0.025 g/m^3;
   b) ammoniacal nitrogen level concentration less than 0.9 g/m^3;
   c) pH within the range of 6.0 and 9.0; and
   d) dissolved zinc concentration less than or equal to 0.05 g/m^3.

5. The discharge shall not cause the following effects in the receiving waters of the unnamed tributary of the Makuri Stream;

   a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   b) any conspicuous change in the colour or visual clarity;
   c) any emission of objectionable odour;
   d) the rendering of fresh water unsuitable for consumption by farm animals;
   e) any significant adverse effects on aquatic life.

6. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2022 and/or June 2028 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 16 June 2016

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	Stratford District Council PO Box 320 Stratford 4352
Decision Date:	16 June 2016
Commencement Date:	16 June 2016

Conditions of Consent

Consent Granted:	To discharge stormwater and leachate from the former Pukengahu Landfill into an unnamed tributary of the Waihapa Stream
Expiry Date:	1 June 2034
Review Date(s):	June 2022, June 2028
Site Location:	Wingrove Road, Pukengahu
Grid Reference (NZTM)	1719066E-5639665N
Catchment:	Patea
Tributary:	Waihapa

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General condition

a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The landfill cap and stormwater and leachate drainage systems shall be maintained in a manner that:

   a) minimises stormwater infiltration into the filled area; and
   b) ensures stormwater is adequately diverted and/or drained away from the landfill cap.

3. The site shall be operated in accordance with a 'Management Plan' prepared by the consent holder within 3 months of granting of this consent, and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site will be managed to achieve compliance with the conditions of this consent and shall include but not be limited to:

   a) specifying the consent holders monitoring schedule for the site;
   b) maintenance of the landfill cap to minimise ponding and stormwater infiltration;
   c) maintenance and management of the stormwater drains on and around the landfill to ensure stormwater is adequately diverted and/or drained away from the landfill cap.

4. After reasonable mixing the receiving waters downstream of the discharge shall meet the following standards:

   a) unionised ammonia concentration less than 0.025 g/m^3;
   b) ammoniacal nitrogen level concentration less than 0.9 g/m^3;
   c) pH within the range of 6.0 and 9.0; and
   d) dissolved zinc concentration less than or equal to 0.05 g/m^3.

5. The discharge shall not cause the following effects in the receiving waters after reasonable mixing:

   a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   b) any conspicuous change in the colour or visual clarity;
   c) any emission of objectionable odour;
   d) the rendering of fresh water unsuitable for consumption by farm animals;
   e) any significant adverse effects on aquatic life.

6. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2022 and/or June 2028 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 16 June 2016

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Appendix II

Categories used to evaluate environmental and administrative performance

Categories used to evaluate environmental and administrative performance

Environmental performance is concerned with actual or likely effects on the receiving environment from the activities during the monitoring year. Administrative performance is concerned with the Company's approach to demonstrating consent compliance in site operations and management including the timely provision of information to Council (such as contingency plans and water take data) in accordance with consent conditions.

Events that were beyond the control of the consent holder and unforeseeable (that is a defence under the provisions of the RMA can be established) may be excluded with regard to the performance rating applied. For example loss of data due to a flood destroying deployed field equipment.

The categories used by the Council for this monitoring period, and their interpretation, are as follows:

Environmental Performance

High: No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment. The Council did not record any verified unauthorised incidents involving environmental impacts and was not obliged to issue any abatement notices or infringement notices in relation to such impacts.

Good: Likely or actual adverse effects of activities on the receiving environment were negligible or minor at most. There were some such issues noted during monitoring, from self-reports, or during investigations of incidents reported to the Council by a third party but these items were not critical, and follow-up inspections showed they have been dealt with. These minor issues were resolved positively, co-operatively, and quickly. The Council was not obliged to issue any abatement notices or infringement notices in relation to the minor non-compliant effects; however abatement notices may have been issued to mitigate an identified potential for an environmental effect to occur.

For example:

- High suspended solid values recorded in discharge samples, however the discharge was to land or to receiving waters that were in high flow at the time;
- Strong odour beyond boundary but no residential properties or other recipient nearby.

Improvement required: Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self-reports, or during investigations of incidents reported to the Council by a third party. Cumulative adverse effects of a persistent minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

Poor: Likely or actual adverse effects of activities on the receiving environment were significant. There were some items noted during monitoring, from self-reports, or during investigations of incidents reported to the Council by a third party. Cumulative adverse effects of a persistent moderate non-compliant activity could elevate an 'improvement required' issue to this level. Typically there were grounds for either a prosecution or an infringement notice in respect of effects.

Administrative performance

High: The administrative requirements of the resource consents were met, or any failure to do this had trivial consequences and were addressed promptly and co-operatively.

Good: Perhaps some administrative requirements of the resource consents were not met at a particular time, however this was addressed without repeated interventions from the Council staff. Alternatively

adequate reason was provided for matters such as the no or late provision of information, interpretation of 'best practical option' for avoiding potential effects, etc.

Improvement required: Repeated interventions to meet the administrative requirements of the resource consents were made by Council staff. These matters took some time to resolve, or remained unresolved at the end of the period under review. The Council may have issued an abatement notice to attain compliance.

Poor: Material failings to meet the administrative requirements of the resource consents. Significant intervention by the Council was required. Typically there were grounds for an infringement notice.