R H Vosseler Landfill Monitoring Programme Annual Report 2012-2013

Technical Report 2013-53

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Executive summary

R H Vosseler operated a private landfill on his farm at Sole Rd Ngaere in the Patea catchment. The landfill was closed in late 2011 when a tipface fire alerted Council to its presence. As the landfill site was within 25 metres of a waterway and found to contain contaminants such as zinc-based agricultural pharmaceuticals it was determined by Council that either all of the contaminants be removed from the site or a consent would be required to manage and maintain the closed landfill. R H Vosseler applied for consent to discharge leachate and this was granted in March 2012.

This report for the period July 2012-June 2013 describes the monitoring programme implemented by the Taranaki Regional Council to assess the consent holder's environmental performance during the period under review, and the results and environmental effects of the consent holder's activities. This is the second annual report to be prepared by the Taranaki Regional Council to cover the consent holder's discharges and their effects.

RH Vosseler holds one resource consent to discharge leachate from a closed landfill, which includes a total of six conditions setting out the requirements that the consent holder must satisfy.

The Council's monitoring programme for the year under review included two inspections and four water samples collected for physicochemical analysis.

The monitoring showed that since its closure and reinstatement the landfill's presence is not having a significant effect on the environment. No complaints were received about the site, nor were any incidents logged by Council.

During the period under which the consent was monitored, RH Vosseler has demonstrated a high level of environmental performance and compliance with the resource consent.

For reference, in the 2012-2013 year, 35% of consent holders in Taranaki monitored through tailored compliance monitoring programmes achieved a high level of environmental performance and compliance with their consents, while another 59% demonstrated a good level of environmental performance and compliance with their consents.

This report includes recommendations for the 2013-2014 year.

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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 the Annual Report for the period July 2012-June 2013 by the Taranaki Regional Council describing the monitoring programme associated with resource consent held by R H Vosseler. The consent holder operates a closed landfill situated on Sole Road, Ngaere.

One of the intents of the Resource Management Act (1991) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective. Accordingly, the Taranaki Regional Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of the R H Vosseler's use of water, land, and air, and is the second report by the Taranaki Regional Council for the landfill managed by the consent holder

1.1.2 Structure of this report

Section 1 of this report is a background section. It sets out general information about compliance monitoring under the Resource Management Act and the Council's obligations and general approach to monitoring sites through annual programmes, the resource consent held by R H Vosseler in the Patea 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 Sole Rd site.

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

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

Section 4 presents recommendations to be implemented in the 2013-2014 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 Resource Management Act 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 a discharger, and may include cultural and socio-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 (e.g. recreational, cultural, or aesthetic);
(e) risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Taranaki Regional Council is recognising the comprehensive meaning of `effects' inasmuch as is appropriate for each discharge source. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the Resource Management Act to assess the effects of the exercise of consents. In accordance with section 35 of the Resource Management Act 1991, the Council undertakes compliance monitoring for consents and rules in regional plans; and maintains an overview of performance of resource users against regional plans and consents. Compliance monitoring, (covering both activity and impact) monitoring, also enables the Council to continuously assess its own performance in resource management as well as that of resource users particularly consent holders. It further 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 and consent performance

Besides discussing the various details of the performance and extent of compliance by the consent holder(s) during the period under review, this report also assigns an overall rating. The categories used by the Council, and their interpretation, are as follows:

- a **high** level of environmental performance and compliance indicates that essentially there were no adverse environmental effects to be concerned about, and no, or inconsequential (such as data supplied after a deadline) non-compliance with conditions.

- a **good** level of environmental performance and compliance indicates that adverse environmental effects of activities during the monitoring period were negligible or minor at most, or, the Council did not record any verified unauthorised incidents involving significant environmental impacts and was not obliged to issue any abatement notices or infringement notices, or, there were perhaps some items noted on inspection notices for attention but these items were not urgent nor critical, and follow-up inspections showed they have been dealt with, and any inconsequential non compliances with conditions were resolved positively, co-operatively, and quickly.

- **improvement desirable (environmental)** or **improvement desirable (compliance)** (as appropriate) indicates that the Council may have been obliged to record a verified unauthorised incident involving measurable environmental impacts, and/or, there were measurable environmental effects arising from activities and intervention by Council staff was required and there were matters that required urgent intervention, took some time to resolve, or remained unresolved at end of the period under review, and/or, there were on-going issues around meeting resource consent conditions even in the absence of environmental effects. Abatement notices may have been issued.

- **poor performance (environmental)** or **poor performance (compliance)** indicates generally that the Council was obliged to record a verified unauthorised incident involving significant environmental impacts, or there were material failings to comply with resource consent conditions that required significant intervention by the Council even in the absence of environmental effects. Typically there were grounds for either a prosecution or an infringement notice.

For reference, in the 2012-2013 year, 35% of consent holders in Taranaki monitored through tailored compliance monitoring programmes achieved a high level of environmental performance and compliance with their consents, while another 59% demonstrated a good level of environmental performance and compliance with their consents.

1.2 Process description

The subject site is located at 79 Sole Road, Stratford and is approximately 4.5 km south east of the town of Stratford. The predominant land use surrounding the site is mainly dairy farming with some dry stock and lifestyle blocks. The Ngaere Stream is located north of the landfill site, however, spring water runs through this area which then runs into the Ngaere Stream.

The dump was used as a general farm dump, however the presence of a significant amount of zinc oxide in the dump was confirmed and zinc was detected in the leachate. The site was scraped back so that (where possible) no contaminants were within 25 m of a water body and then the site was capped.

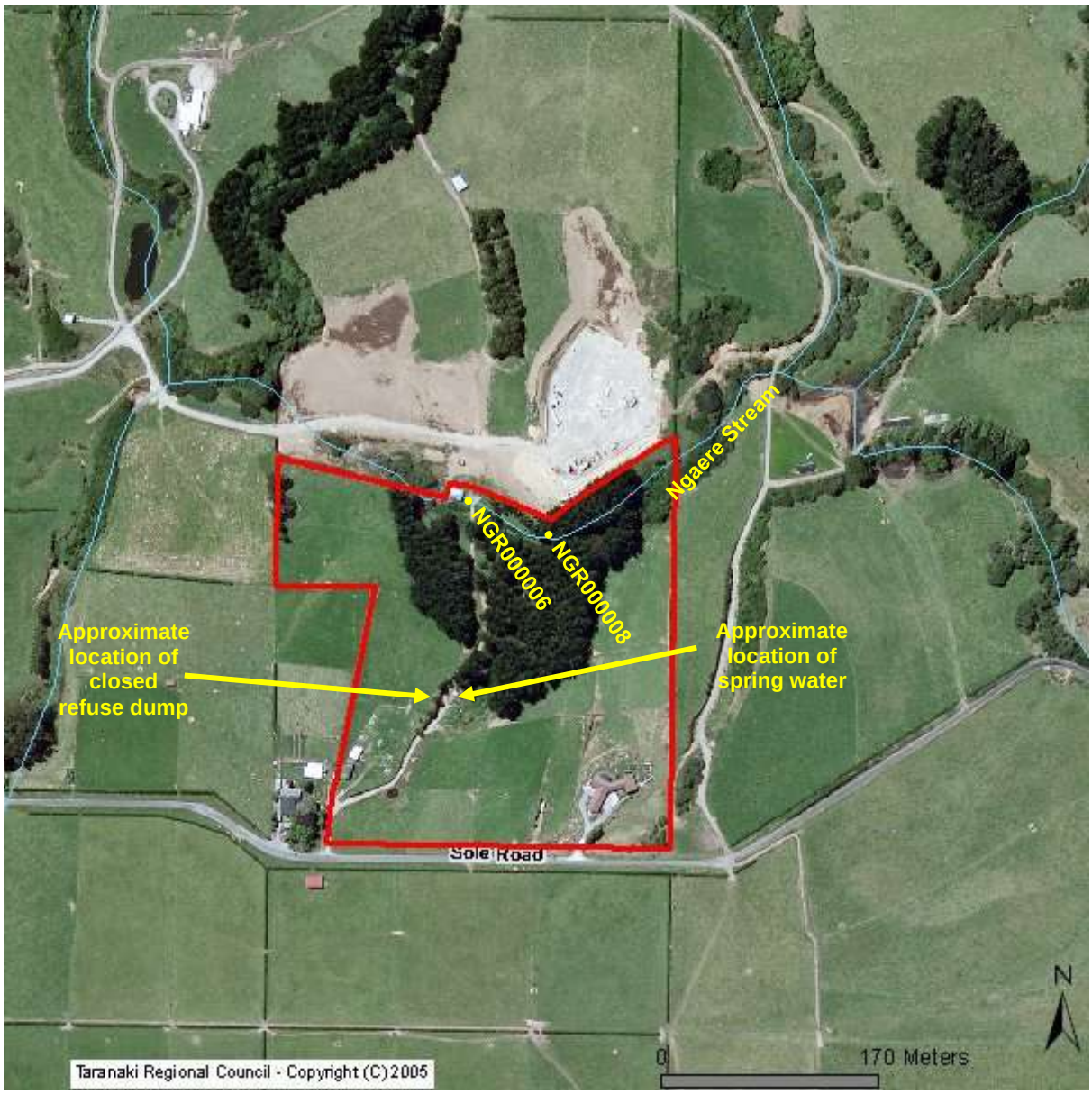

Figure 1 Aerial image of the Sole Rd property and sampling sites

1.3 Resource consent

Section 15(1)(a) of the Resource Management Act 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.

Consent 9216-1

R H Vosseler holds water discharge permit **0926-1** to discharge contaminants (leachate) from a closed farm refuse dump into land adjacent to the Ngaere Stream. This permit was issued by the Taranaki Regional Council on 6 March 2012 under Section 87(e) of the Resource Management Act. It is due to expire on 1 June 2016.

Special condition 1 requires that the site not be used for further dumping of refuse.

Special condition 2 requires that vegetative cover be maintained on the landfill cap.

Special condition 3 requires that the landfill cap be maintained to certain standards.

Special conditions 4 and 5 deal with water quality requirements downstream of the landfill.

Special condition 6 is a review condition.

The permit is attached to this report in Appendix I.

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the Resource Management Act sets out obligation/s upon the Taranaki Regional Council to gather information, monitor, and conduct research on the exercise of resource consents, and the effects arising, within the Taranaki region and report upon these.

The Taranaki Regional 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 monitoring programme for the Sole Rd site consisted of three primary components.

1.4.2 Programme liaison and management

There is generally a significant investment of time and resources by the Taranaki Regional Council in ongoing liaison with resource consent holders over consent conditions and their interpretation and application, in discussion over monitoring requirements, preparation for any reviews, renewals, or new consents, advice on the Council's environmental management strategies and the content of regional plans, and consultation on associated matters.

1.4.3 Site inspections

The site was visited on two occasions during the monitoring period following the granting of the consent. With regard to the consent for the discharge to land, the main points of interest were site processes with potential or actual discharges to receiving watercourses. The neighbourhood was also surveyed for environmental effects.

1.4.4 Chemical sampling

The Taranaki Regional Council undertook sampling of receiving waters at the site on two occasions. These samples were analysed for pH, biochemical oxygen demand, ammonia and zinc.

2. Results

2.1 Inspections

The site was inspected on two occasions in 2012-2013 period. The findings of the inspections are given below.

2.1.1 31 October 2012

A site visit was made to conduct a compliance monitoring inspection and to take water samples. The weather was fine with no rain over the previous 48 hours. No visual effects were noted in the stream during sampling and both samples were clear and had no odour. No leachate seepages or exposed refuse were observed and the cap was sound. The site was in compliance with consent conditions.

2.1.2 24 April 2013

A site visit was made to conduct a compliance monitoring inspection and to take water samples. The weather was showery with 11 mm rain over the previous 48 hours. No leachate seepages or exposed refuse were observed and the cap was sound. No visual effects were noted in the stream during sampling. Both samples were slightly turbid and had no odour.

2.2 Results of receiving environment sampling

Discharges from the site were sampled on two occasions during the 2012-2013 period.

The samples were taken from the Ngaere Stream sites NGR00006 (upstream of the landfill tributary) and NGR00008 (downstream of the landfill tributary). These sites are shown in Figure 1 and the results are given below in Tables 1 and 2.

Table 1 Results of water samples taken at R H Vosseler's site on 31 October 2012

Parameter	Units	NGR000006 u/s of landfill trib	NGR000008 d/s of landfill trib	Consent limits at NGR000008
BOD	g/m^3	<0.5	1.0	3.0
Unionised ammonia	g/m^3	0.00015	0.00055	0.025
Ammoniacal nitrogen	g/m^3	0.066	0.051	N/A
pH	pH	6.9	7.5	> 6, < 9
Temperature	Deg C	13.4	15.5	N/A
Dissolved zinc	g/m^3	<0.005	0.009	0.05

Key:
BOD = biochemical oxygen demand

Table 2 Results of water samples taken at R H Vosseler's site on 24 April 2013

Parameter	Units	NGR000006 u/s of landfill trib	NGR000008 d/s of landfill trib	Consent limits at NGR000008
BOD	g/m^3	<0.5	<0.5	3.0
Unionised ammonia	g/m^3	0.00050	0.00108	0.025
Ammoniacal nitrogen	g/m^3	0.197	0.184	N/A
pH	pH	6.9	7.3	> 6 < 9
Temperature	Deg C	14.5	13.5	N/A
Dissolved zinc	g/m^3	0.008	0.006	0.05

Key:
BOD = biochemical oxygen demand

The results complied with consent conditions for pH, biochemical oxygen demand, ammonia, and zinc. There were no significant differences in any of the results when comparing the up and downstream sites. All other parameters also complied with consent conditions.

2.3 Investigations, interventions, and incidents

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 consent holder. During the year matters may arise which require additional activity by the Council e.g. provision of advice and information, or investigation of potential or actual courses of non-compliance or failure to maintain good practices. A pro-active approach that in the first instance avoids issues occurring is favoured.

The Taranaki Regional Council operates and maintains a register of all complaints or reported and discovered excursions from acceptable limits and practices, including non-compliance with consents, which may damage the environment. The Unauthorised Incident Register (UIR) includes events where the consent holder concerned has itself notified the Council. The register contains details of any investigation and corrective action taken.

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 consent holder is indeed the source of the incident (or that the allegation cannot be proven).

In the 2012-2013 year, it was not necessary for the Council to undertake significant additional investigations and interventions, or record incidents.

There were no incidents recorded by the Council that were associated with non-compliance by R H Vosseler with conditions in resource consents or provisions in Regional Plans.

3. Discussion

3.1 Discussion of site performance

The site remains capped and vegetated and no further dumping is occurring in the area. No issues in regards to site management were noted.

3.2 Environmental effects of exercise of consent

There is a small rise in the level of zinc at the downstream site and this value, whilst compliant with consent conditions slight exceeded the ANZECC trigger value of 0.008 g/m^3. It should be noted however that natural background levels of zinc in Taranaki surface water can range up to 0.05 g/m^3.

Other parameters such as BOD and ammonia were all at very low levels and compliant with consents conditions.

These results and those gathered in the previous monitoring year, indicate that the presence of the landfill is not having an adverse effect of the receiving waters. As the site was complying with rule 29 of Regional Freshwater Plan of Taranaki, the consent holder applied to have consent 9216 surrendered in June 2013.

3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 3.

Table 3 Summary of performance for Consent 9216-1 to discharge contaminants (leachate) from a closed farm refuse dump into land adjacent to the Ngaere Stream

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Dumping of rubbish to cease	Site inspection	Yes
2. Vegetative cover maintained	Site inspection	Yes
3. Cap to be maintained	Site inspection	Yes
4. Discharge not cause certain parameters to be exceeded in Ngaere Strum	Sampling	Yes
5. Discharge not cause certain effects in Ngaere Stream	Inspection and water sampling	Yes
6. Option review provision	A review was not necessary	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**

N/A = not applicable

R H Vosseler demonstrated a high level of environmental performance and compliance with the resource consent. There were no incidents recorded and no complaints were received.

3.4 Recommendation from the 2011-2012 Annual Report

The 20012-2013 annual report recommended:

THAT monitoring of discharges at R H Vosseler's Sole Rd site in the 2012-2013 year consist of two inspections and two sampling runs.

This recommendation was fully implemented.

3.5 Alterations to monitoring programmes for 2013-2014

In designing and implementing the monitoring programmes for air/water discharges in the region, the Taranaki Regional Council has taken into account the extent of information made available by previous authorities, its relevance under the Resource Management Act, the obligations of the Act in terms of monitoring emissions/discharges and effects, and subsequently reporting to the regional community, 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 emitting to the atmosphere/discharging to the environment.

It is proposed that for 2013-2014, monitoring be discontinued as consent 9216 has been surrendered.

4. Recommendation

THAT monitoring of discharges at R H Vosseler's Sole Rd monitoring be discontinued as the consent 9216 has been surrendered.

Glossary of common terms and abbreviations

The following abbreviations and terms are used within this report:

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
CBODF	CBOD of dissolved carbonaceous nutrients
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
Condy	conductivity, an indication of the level of dissolved salts in a sample, usually measured at 20°C and expressed in mS/m
Cu*	copper
Cumec	A volumetric measure of flow- 1 cubic metre per second (1 m3s-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/m3	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
l/s	litres per second
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
mS/m	millisiemens per metre
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
NH4	ammonium, normally expressed in terms of the mass of nitrogen (N)
NH3	unionised ammonia, normally expressed in terms of the mass of nitrogen
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
PM_{10}	relatively fine airborne particles (less than 10 micrometre diameter)
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
UI	Unauthorised Incident
UIR	Unauthorised 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
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 the Council's laboratory.

Bibliography and references

Taranaki Regional Council 2012: Officer Report 9216-1 RH Vosseler Taranaki Regional Council, Stratford.

Taranaki Regional Council (2012): "RH Vosseler Landfill Monitoring Programme Annual Report 2012-05'. Technical Report 2012-31

Appendix I

Resource consent held by
R H Vosseler

TARANAKI REGIONAL COUNCIL
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Please quote our file number on all correspondence

Discharge Permit

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

Name of Consent Holder:	Ralph Henry Vosseler P O Box 271 STRATFORD 4352
Decision Date:	6 March 2012
Commencement Date:	6 March 2012

Conditions of Consent

Consent Granted:	To discharge contaminants (leachate) from a closed farm refuse dump into land adjacent to the Ngaere Stream at or about (NZTM) 1712491E-5640511N
Expiry Date:	1 June 2016
Review Date(s):	June 2013
Site Location:	79 Sole Road, Stratford
Legal Description:	Lot 1 DP 19529 Blk VI Ngaere SD (Discharge source & site)
Catchment:	Patea
Tributary:	Ngaere

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 to section 36 of the Resource Management Act.

Special conditions

1. The consent holder shall ensure that the area of land previously used as a refuse dump shall not be used in the future for this purpose.

2. The consent holder shall ensure that the area of land previously used as a refuse dump is permanently covered with low level vegetation.

3. The consent holder shall ensure that the soil overlying the closed refuse dump shall be compacted, contoured, and maintained to ensure that stormwater is directed away from this area.

4. The discharge shall not cause the following effects in the unnamed tributary of the Ngaere Stream at or about NZTM 1712637E-5640649N (30 metres downstream of dam outlet);

   (a) unionised ammonia (expressed as nitrogen) of greater 0.025 gm^{-3};

   (b) dissolved zinc of greater than 0.05 gm^{-3};

   (c) an increase in biochemical oxygen demand of more than 3.00 g;

   (d) a pH of <6.0 or>9.0.

5. After allowing for reasonable mixing, within a mixing zone extending 10 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:

   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 2013, 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 March 2012

For and on behalf of
Taranaki Regional Council

Director-Resource Management