From: "Alan Johnson" <Alan@nzmca.org.nz>
Sent: Tue, 16 May 2023 11:48:15 +1200
To: "Quentin Budd" <Quentin.Budd@waipadc.govt.nz>
Cc: "moonlightlady@xtra.co.nz" <moonlightlady@xtra.co.nz>; "rayscone@gmail.com" <rayscone@gmail.com>; "James Imlach" <James@nzmca.org.nz>
Subject: RE: External Sender: Review of proposed scope of works for Pirongia Rd application
Attachments: HD2798 - Te Awamutu Landfill Gas Assessment - Technical Report Final.pdf

Good morning Quentin

Attached is a technical report from HD Geo which covers the landfill gas investigation for our proposed vehicle based campsite at 4 Pirongia Road Te Awamutu. We believe that this is a thorough and professional report assessing the residual risks associated with landfill gases on the closed landfill site.

As we expected this investigation has been unable to find any presence of CH_4 and found that other likely landfill gases such as CO_2 were present at levels representative of atmospheric conditions (see p.9). In arriving at these results HD Geo undertook 10 bore samples (p.7) including one (HA 05) adjacent to a wastewater pipe running through the site (see bore plan Appendix E) where it might be expected that landfill gases may accumulate.

This report also includes (at Appendix I) a proposed site management plan for monitoring landfill gases during and following the proposed works required to establish the vehicle based campsite. This includes works required for the proposed dump station.

You will note that the report recommends that because *'the DSI investigation* (undertaken previously by WSP) *shows soil contaminants exceed background concentrations ….. we consider that the proposal is a controlled activity under NESCS'*. We accept this recommendation and will be making an additional application for this consent. Before doing so however, and with a mind to avoiding any further delays in this consent process, I would be grateful if you could advise us of what additional information you require over and above the information already provided, to support this further application.

NZMCA is keen to proceed to the development works for this activity in the 2023/24 earthworks season and we are already discussing this possibility with a local contractor. To allow this to happen we wish to proceed to any hearing as soon as possible. Decisions around notification of this application should in our opinion not need to wait until the further application under NESC is lodged and reviewed by Council given that the information supporting this application will most likely be the same as the information now provided for the land use application. I would appreciate it if you are able to provide us with this notification decision as soon as possible so that we can begin planning the next steps in the application process.

Please call me to discuss any matter which you need clarification on regarding this information or any details regarding additional information still required

Regards

From: Quentin Budd <Quentin.Budd@waipadc.govt.nz>
Sent: Friday, February 17, 2023 9:41 AM
To: Alan Johnson <Alan@nzmca.org.nz>
Cc: moonlightlady@xtra.co.nz; rayscone@gmail.com; James Imlach <James@nzmca.org.nz>
Subject: RE: External Sender: Review of proposed scope of works for Pirongia Rd application

Hi Alan,

Thanks for the phone discussion. I can confirm that following receipt of an adequate landfill gas and cap integrity assessment, and peer review by Samantha, we will be able to proceed to the decision making stage of the application.

Kind Regards,

.....
Quentin Budd *Consents Team Leader* **WAIPA DISTRICT COUNCIL**
Quentin.Budd@waipadc.govt.nz | www.waipadc.govt.nz
EXT 6539 | **MOB:** 0273394022 | **FAX:** 07 872 0033

From: Alan Johnson <Alan@nzmca.org.nz>
Sent: Thursday, 16 February 2023 4:39 pm
To: Quentin Budd <Quentin.Budd@waipadc.govt.nz>
Cc: moonlightlady@xtra.co.nz; rayscone@gmail.com; James Imlach <James@nzmca.org.nz>
Subject: External Sender: Review of proposed scope of works for Pirongia Rd application

Good afternoon Quentin

I expect that you have been following the slow progress which NZMCA is making in obtaining the necessary resource consents for the proposed camping ground on Council land at Pirongia Road.

We have been frustrated in these efforts by what we believe is a creep in the regulatory scope being insisted on by Craig Inskeep on behalf of Council. This has occurred in particular around s.129 requests for more information when we believe much of the information we have already provided is appropriate, proportionate and accurate.

Presently we are attempting to meet a further request for information around the status of the closed landfill at the Pirongia Road property. This request relates to the risks associated with landfill gases and the integrity of the landfill cap with respect to the works proposed on the site. By its nature this is specialised technical work which needs to be closely specified in order to generate the information needed to adequately inform the consent assessment process. NZMCA is prepared to pay for this work but we want to be sure that this is what is finally required for the consent assessment to be done.

To that end we would like confirmation from Council that the scope of work proposed by our consultant engineers will meet its expectations around the nature and extent of the assessments required. I have attached the first of these proposed scopes of works relating to landfill gas risk assessment and seek

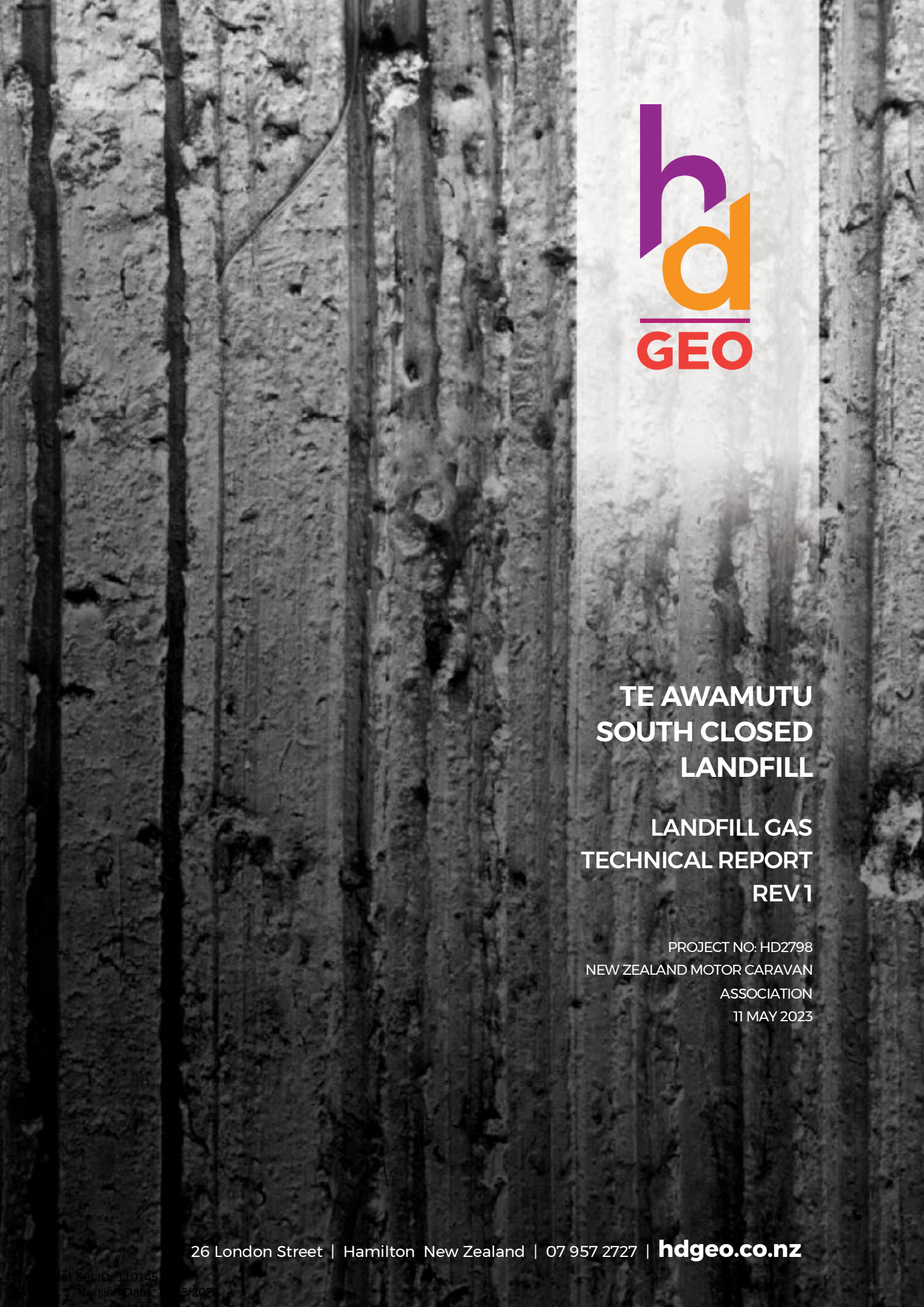
Council's agreement that this is at least sufficient to meet these expectations. I look forward to receiving this feedback as soon as possible so that we can commission this (or similar) work without further delay.

We are still working on appointing a suitable consultant for the required assessment of the landfill cap integrity. Once we have found this consultant we will forward you their proposed scope of work and methodology for feedback.

Please feel free to call me on the number below if you would lie to discuss any aspect of this request

Regards

Alan Johnson
Senior Policy Analyst
New Zealand Motor Caravan Association (Inc)
Mob: 0274791958



TE AWAMUTU SOUTH CLOSED LANDFILL

LANDFILL GAS TECHNICAL REPORT REV 1

PROJECT NO: HD2798
NEW ZEALAND MOTOR CARAVAN ASSOCIATION
11 MAY 2023

26 London Street | Hamilton New Zealand | 07 957 2727 | **hdgeo.co.nz**

Executive summary

The New Zealand Motor Caravan Association (NZMCA) propose to develop a section of the Te Awamutu South Closed Landfill (the site) for use as a motor caravan parking site. A previous detailed site investigation (DSI) by WSP recommended that further investigations should be undertaken to better characterise the risk of landfill gas. Further reviews were undertaken by 4Sight Consulting (4Sight) on behalf of Waipa District Council (WDC) which concurred that an additional assessment of landfill gas should be undertaken to assess the risk to future site users. These recommendations were taken onboard by WDC and formalised in an email from a resource consent consultant.

We (HD Geo) prepared this report to evaluate the presence of landfill gases originating from the Te Awamutu South Closed Landfill, and to evaluate the potential risk to human health from landfill gases, relating to the proposed construction works and the proposed final land use.

From our desktop investigation, site visit and landfill gas sampling, we have concluded that:

- historic aerial imagery suggests the landfill on the site has operated from the early 1960's to the early 1970's
- it is unlikely the landfill is producing significant concentrations or volumes of gases after being closed for more than 50 years
- groundwater and surface water monitoring events undertaken on the site have demonstrated generally consistent results, with no evidence of leachate production (and hence waste decomposition and associated landfill gas production) and full compliance with discharge resource consents
- available historical landfill gas sampling events in monitoring bores show no CH_4 and negligible CO_2
- no evidence of landfill material, vegetation dieback, liquid or gas emissions were noted during the site walkover
- our sampling showed gases generally representative of atmospheric conditions, with no CH_4 detected
- there is no evidence to suggest a risk to human health from landfill gas should the proposed development be undertaken, provided the site is properly managed during development, and continues to be properly managed for the final proposed landuse (motor caravan parking site)
- this report has determined that it is highly unlikely that there is a risk posed to human health by landfill gas, but the DSI investigation shows soil contaminants exceed background concentrations. As such we consider that the proposal is a controlled activity under the NESCS
- the proposed shallow excavation for installation of the dump station will not provide new pathways for contaminant migration in accordance with NES:CS Reg 8(3)(g), as there is no evidence of landfill gas production, the landfill cap appears to have a depth of at least 1m at this location and the cap will be reinstated.

We have recommended that:

- the site management plan (SMP) included in Appendix I is utilised during intrusive site development works, including the monitoring of landfill gas during the dump station excavations
- this report is supplied to WDC in support of the proposed development.

Contents

Introduction

The New Zealand Motor Caravan Association (NZMCA) propose to develop a section of the Te Awamutu South Closed Landfill (the site) for use as a motor caravan parking site. As part of suitability assessments for the site, a detailed site investigation (DSI) was undertaken by WSP[1] which recommended that further investigations should be undertaken to better characterise the risk of landfill gas for the proposed landuse.

A technical review of the DSI was undertaken by 4Sight Consulting[2] on behalf of Waipa District Council (WDC) which concurred that an additional assessment of landfill gas should be undertaken to assess the risk to future site users. This review has been included in Appendix A.

The recommendations to undertake further landfill gas investigations were included in an email from a WDC consultant. Appendix B contains the email correspondence.

We (HD Geo) prepared this report to evaluate the presence of landfill gases originating from the Te Awamutu Closed Landfill, and to evaluate the potential risk to human health from landfill gases, relating to the proposed construction works and the proposed final land use.

Scope and purpose

The purpose of this report is to evaluate the risk to human health from potential landfill gases emanating from the Te Awamutu closed landfill with regard to the proposed development. The evaluation and assessment will support a resource consent application to undertake earthworks and to develop the site into a motor caravan parking site.

The scope of this investigation is limited to:

- a desktop study, including review of historic aerial imagery, available historical monitoring reports, applicable council records, and any other relevant supplied documents
- a site inspection to identify features of interest and potential contamination sources
- limited on-site gas sampling to evaluate potential risk to human health for the proposed landuse

Site description

The site is accessed from a gravel path off Pirongia Road. The site is roughly rectangular in shape, and is bounded by rural/residential housing to the southwest, pasture grazing to the northwest, and waterways to the northeast and southeast.

The site is located approximately 43m above mean sea level and is relatively flat, with a slight slope downwards towards the north and northeast. The Mangapiko stream borders the site along the northeastern extent, while an unnamed tributary of the Mangapiko stream borders along the southeastern extent.

The geological map of the area indicates the site is underlain by holoscene river deposits, comprising alluvial and colluvial sands, silt, mud and clay with local gravels and peat beds.

[1] WSP. Te Awamutu Closed Landfill Detailed Site Investigation. 28 July 2021

[2] 4Sight Consulting. Memorandum, 14 July 2022

Desktop Investigation

We completed a desktop study prior to the site visit to gather as much information as possible to inform our initial assessment of landfill gas risk. This included a review of historical aerial imagery, historical monitoring events, council records and client supplied documentation.

Historical aerial imagery

We completed a review of historic aerial photos. Aerial photos are provided in Appendix C and described in Table 2.

Table 2: Historical aerial photos

Year	Description
1961	The site is not in use as a landfill and is grazing pasture. The surrounding landuse is pasture to the south and west. The Mangapiko Stream is present to the north of the site.
1966	Soils on the site have been disturbed, and vehicle tracks are present over the site. A small building is observed on the southern perimeter.
1967	Vehicle tracks are less obvious over the site, and it appears vegetation has regrown over much of the site
1971	Some refuse is observable over the site, particularly on the north western corner. The composition of the refuse is not discernible.
1974	No change
1979	Tracks are less formed over the site, with much of the site being bare land
1995	The site is no longer in use as a landfill, and has reverted to grazing pasture

Historical monitoring events

We reviewed 4 previous gas monitoring events from the monitoring wells located on the site. These wells (TGB1 and TGB2) were installed in December 2008 to a depth of 3m in material comprising primarily silt and sand. We have not been able to obtain a plan showing the location or design of these monitoring wells. The sampling events are attached as Appendix D, and are available for the following time periods:

- December 2008
- April 2010
- March 2011
- September 2011

For all monitoring events, concentrations of carbon dioxide (CO_2) and oxygen (O_2) were generally representative of atmospheric conditions. CO_2 concentrations were recorded at a maximum of 2.1% on one occasion. Methane (CH_4) was not detected in any of the sampling events.

Council records and supplied documentation

URS Technical assessment of resource consent applications for Te Awamutu landfill (July 2001)

URS prepared a technical assessment of resource consent applications for the Te Awamutu closed landfill, completed for Environment Waikato. The technical assessment was prior to the placement of additional capping material over the landfill. The effects of the landfill on groundwater, surface water, and air quality were reviewed. URS noted that:

- the August 2000 test pit investigations undertaken by the applicant indicated a variable refuse depth of up to 4m and that the base of the landfill refuse is below the water table at a number of locations.
- the dumping at the southern site was not identified until the year 2000 by the applicant.
- no subsurface investigations were undertaken beyond the test pit investigations in the year 2000, and no groundwater monitoring was undertaken.
- 2 landfill gas monitoring wells were installed south of the site in late 2000 or early 2001.
- monitoring of the wells in May and June 2001 indicated that there was no landfill gas migration. The results of this monitoring were not available.
- the installation of additional capping at the site may result in some lateral migration of landfill gas.

The URS review recommended that a spiking survey should be undertaken along the south-western side of the site following the installation of the capping. No record of this spiking survey has been found, despite HD Geo's requests to Council.

WDC site compliance report (February 2019 to October 2021)

The WDC site compliance report assessed the consent holder's compliance with the requirements of resource consent AUTH940126.01.01 for the period between February 2019 and October 2021.

The assessment showed the site was fully compliant with the resource consent requirements, referencing the 2008, 2010 and 2011 gas monitoring events. Reference was also made to a 2008-2009 gas spiking survey, however this was not available for review and was unable to be retrieved from council upon further requests.

The compliance monitoring report additionally noted the site was fully compliant with the conditions of resource consent AUTH940126.01.02. for the discharge of leachate into the ground from the closed Te Awamutu landfill. This compliance references the results of the April 2021 AECOM monitoring report.

AECOM Aftercare and Management Plan. Te Awamutu Closed Landfill (December 2020)

The 2020 AECOM report states that refuse disposal at the South Landfill began in the 1940's and continued until 1970. In 2009 a pipeline was installed through the south landfill to convey wastewater from Te Awamutu to a new wastewater treatment plant located northwest of the site.

The 2020 AECOM report states that capping works were completed on the site in 2002, with a minimum of 300mm of clay overlaid with 150mm of topsoil covering the site.

WSP DSI 2021

WSP completed a DSI in July 2021. The DSI mainly related to contaminated land, however some gas monitoring was undertaken. WSP took 21 soil samples from the capping of the closed landfill. No actual landfill material was sampled and analysed. All contaminant concentrations were below the applied recreational guideline value.

During the soil sampling investigation, WSP completed field screening for landfill gas at each sampling location. Gas readings were recorded at zero for all but one of the test pit locations. TA06 recorded a reading of 1 part per million (ppm) for hydrogen sulphide (H_2S). TA06 was located near the centre of the site.

AECOM compliance monitoring reports (April 2021 and April 2022)

The client supplied 2 compliance monitoring reports written by AECOM for April 2021 and June 2022. Both monitoring events included groundwater and surface monitoring at the Te Awamutu South and North landfills. Both reports concluded that the water quality was generally consistent with previous monitoring events, albeit with some minor fluctuations that were not considered representative of any change in site conditions.

We note from the groundwater monitoring results that ammonium (a possible indicator of leachate production) concentrations are significantly lower in the South landfill (all <1mg/l) than the North landfill (max of 51mg/l).

Summary of desktop investigation

From the information available in the desktop study, we can conclude that:

- there is no available information on the composition of the refuse in the Te Awamutu South closed landfill. The composition of the waste remains unknown.
- groundwater and surface water monitoring data collected from the site have been generally consistent, and fully compliant with AUTH940126.01.02 discharge.
- gas monitoring and bore sampling records available for review indicate that there are no methane gas emissions from the site
- results for gas spiking surveys, or other surface monitoring events are not available

Based on our desktop review, we consider it is likely that landfill gas generation and emission on the site is at negligible levels. However crucial information is missing (landfill composition, missing sampling events). As such, and in combination with the request from WDC's consultant planner, we consider that further investigation is required to properly evaluate the risk to human health from landfill gas.

Site visit and sampling

We completed a site walkover to inspect the condition of the landfill capping, and determined areas of the site which may be at risk of gas seepage. We have included photos from our site walkover in Appendix E.

The surface cap of the landfill was observed to be in a good condition, with no obvious cracking, slumping or excavations. No vegetation except pasture grass was growing on the cap. A single manhole was located in the centre-north of the site.

The slope from the site downwards towards the Mangapiko Stream to the north is planted in riparian vegetation, and seems to be in a stable, erosion-resistant state. The entirety of the planted section was walked during the site visit, and no evidence of landfill material or emissions was observed.

We found no evidence of landfill material or liquid emissions anywhere on the site or within the riparian belt. No landfill gases were noted by olfactory means during the site walkover.

Sampling

Sampling was undertaken on the 27th of March 2023. Site conditions were generally favourable with a stable /slightly falling barometric pressure of 1013mb to 1011mb and no wind or rain. Soils on the site were slightly moist from light rain the night prior, however no standing water was observed onsite, and soils were unsaturated. We sampled from 10 locations across the site. Seven of the sampling locations were on or near the perimeter of the landfill area to assess the potential effect on neighbouring properties. Two samples were taken from near the centre mass of the landfill area and 1 sample (HA10) was taken from directly adjacent the manhole onsite, where a wastewater pipeline was installed in 2002. A sampling plan and field notes (with monitoring results) are attached as Appendix F and G respectively.

Sampling locations were hand augured to a depth of 500mm below ground level (bgl), and gases (methane, carbon dioxide, oxygen, hydrogen sulphide, carbon monoxide) and gas flow rate within the augur hole were analysed using a GA5000 gas analyser. Sampling locations HA02, HA03, HA06, HA07, HA09, and HA10 were additionally analysed at depths of 1.0-1.2m bgl. Excavated soils varied across the site, however soils were generally orange/brown sand/silt with a topsoil cap. Refuse was not encountered at any of the sampling locations, at any depth. Images of the retrieved material are available in Appendix H.

All sampling locations analysed displayed gas concentrations that were generally representative of atmospheric conditions (refer Appendix G for field monitoring results). Concentrations of CH_4, H_2S and CO were zero at all locations. O_2 concentrations ranged between 19.4% and 21.0% and CO_2 concentrations between 0.1% and 0.4%. Gas flow rate varied between 0.2L/hr and 0.6L/hr).

It is worth noting that the material comprising the landfill cap contained considerable sand and silt, with minimal clay, and as such would facilitate the advection of any landfill gas. It is considered that if landfill gas was being generated in the underlying waste material that it would likely be detected through the monitoring undertaken.

Assessment

Peak gas production in landfills generally occurs from 5 to 7 years after organic waste is buried[3] with factors such as waste composition, moisture, temperature and available oxygen determining decomposition rate and gas generation. In general, almost all gas is produced within 20 years[3], with small quantities possibly produced for 50 or so years, depending on waste composition and site conditions. As the landfill has been closed for over 50 years (since 1970, per the AECOM aftercare report), it is certain that the peak of gas production (assuming organic material was landfilled) has occurred many years ago. If landfill gas is being produced, it is likely to be minimal.

The gas well monitoring events from 2008 – 2011, and the additional sampling undertaken as part of this investigation suggest that the site is either not actively producing landfill gas or that it is not producing landfill gas in any significantly measurable quantity. Both the review of previous reports and our investigation show that gas levels at the site are generally representative of normal atmospheric conditions, with no CH_4 and negligible CO_2 detected.

[3] Agency for Toxic Substances and Disease Registry (ATSDR). Landfill Gas Basics. 2001

Conceptual Site Model

A conceptual site model (CSM) is a communication tool for considering potential human health risk. The CSM presents likely contamination sources, pathways, and receptors, and potentially complete linkages between the 3. Human health risk can be evaluated based on these linkages.

Considerations taken into account in constructing the CSM are shown in Table 3, below.

Table 3: Conceptual site model

Source	Pathways	Route of entry	Potential receptors	Pathways Complete?
Landfill gas production	Advection of landfill gases through the landfill cap Horizontal migration along preferential pathways with emission beyond site boundary	Inhalation of gases Methane explosion risk	Construction and site workers, future occupants, neighbouring residents	Highly unlikely Historical and current monitoring has found no evidence of the landfill being a source of landfill gas

We consider it highly unlikely that the landfill is a source of landfill gas, and therefore the conceptual site model is incomplete.

There is no evidence to suggest a risk to human health from landfill gas should the proposed development be undertaken, provided the site is properly managed during development, and continues to be properly managed for the final proposed landuse (motor caravan parking site).

Conclusions and recommendations

Our assessment is that:

- historic aerial imagery suggests the landfill on the site has operated from the early 1960's to the early 1970's
- it is unlikely the landfill is producing significant concentrations or volumes of gases after being closed for more than 50 years
- groundwater and surface water monitoring events undertaken on the site have demonstrated generally consistent results, with no evidence of leachate production (and hence waste decomposition and associated landfill gas production) and full compliance with discharge resource consents
- available historical landfill gas sampling events in monitoring bores show no CH_4 and negligible CO_2
- no evidence of landfill material, vegetation dieback, liquid or gas emissions were noted during the site walkover
- our sampling showed gases generally representative of atmospheric conditions, with no CH_4 detected
- there is no evidence to suggest a risk to human health from landfill gas should the proposed development be undertaken, provided the site is properly managed during development, and continues to be properly managed for the final proposed landuse (motor caravan parking site)
- this report has determined that it is highly unlikely that there is a risk posed to human health by landfill gas, but the DSI investigation shows soil contaminants exceed background concentrations. As such we consider that the proposal is a controlled activity under the NESCS
- the proposed shallow excavation for installation of the dump station will not provide new pathways for contaminant migration in accordance with NES:CS Reg 8(3)(g), as there is no evidence of landfill gas production, the landfill cap appears to have a depth of at least 1m at this location and the cap will be reinstated.

We recommend that:

- the site management plan (SMP) included in Appendix I is utilised during intrusive site development works, including the monitoring of landfill gas during the dump station excavations
- this report is supplied to WDC in support of the proposed development

Limitations

This document does not include a full assessment or consideration of potential health and safety issues under the Health and Safety at Work Act 2015 (e.g., working at heights, equipment operation, electrical hazards, etc). HD Geo has relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified by HD Geo. This document may be transmitted, reproduced or disseminated only in its entirety.

From a technical perspective, the subsurface environment at any site may present substantial uncertainty. It is a heterogeneous, complex environment, in which small subsurface features or changes in geologic conditions can have substantial impacts on water, vapour and chemical movement. HD Geo's professional opinions are based on its professional judgement, experience, and training. These opinions are also based upon data derived from the testing and analysis summarised in this document. Should additional information become available, this report should be updated accordingly.

Certification

This report presents information from an environmental site investigation conducted by and under the oversight of a SQEP with landfill gas expertise. Detailed qualifications are available upon request.

Renate Schütte

PREPARED BY: **Campbell Graham**

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Tel 027 867 4290

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RELEASED BY: **Paul Gibbins**

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APPENDIX A – 4SIGHT DSI REVIEW

Memorandum

To: Anish Chand – Environmental Health Team Leader, Waipa District Council

From: Samantha Iles – Senior Environmental Consultant, 4Sight Consulting

Date: 14 July 2022

Subject: LU/0133/22 – PT A LOT 317 MANGAPIKO PSH LOT 3 DPS 62851

4Sight Consulting Ltd (4Sight) was engaged by Waipa District Council (WDC) to conduct a technical review of a Detailed Site Investigation (DSI)[1] submitted by New Zealand Motor Caravan Association. The DSI was submitted in support of a consent application to establish a motor caravan park at Pirongia Road, Te Awamutu (the site).

The information has been reviewed with reference to the requirements of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations (NESCS) (Ministry for the Environment (MfE), 2011) and the Contaminated Land Management Guidelines (CLMG) No. 1 & 5 (MfE, updated 2021).

The Proposed Activity

The site is the location of the Te Awamutu Closed Landfill which ceased operations in 1992 and is now used for stock grazing. The New Zealand Motor Caravan Association is proposing to establish a motor caravan park including 75 parking spaces, a dump station, gravel access road and landscaping[2].

Adequacy of the DSI

A review of the DSI was undertaken to assess the quality of the report, and to determine whether it meets the general requirements of the NESCS and CLMG's 1 & 5.

The key points associated with the DSI review include:

- The DSI provides very little information about the sites history including operational landfill management, landfill contents, capping and ongoing closed landfill management. The Assessment of Environmental Effects (AEE) notes biannual groundwater monitoring of the former landfill has been undertaken since 2003 but there is no mention of any groundwater monitoring in the DSI. This information could be helpful to assess the ongoing risk posed by the landfill material and the state of decomposition of any putrescible material which has the potential to generate landfill gas;
- No analysis of soil samples for polycyclic aromatic hydrocarbons (PAHs) was undertaken. PAHs are a common contaminant of concern associated with landfills;
- Based on the recorded site observations of consistent lithology across the 11 hand auger locations, the number of hand auger locations is considered adequate;
- No field notes or records of the landfill gas monitoring results undertaken during the DSI were provided. Therefore, limited reliance can be placed on this information. The DSI recommended further investigation of landfill gas risk. Due to the absence of information about the contents of the landfill, 4Sight agree with the recommendations in the DSI that further assessment of landfill gas should be undertaken;
- Soil disturbance is required for the excavation of the dump station area which is likely to involve excavations into the landfill material beneath the capping layer. 4Sight agrees with the DSI recommendations that this work should be overseen by a SQEP to ensure that potentially contaminated landfill material is handled appropriately. Any material excavated from beneath the

[1] WSP, 2021. Te Awamutu Closed Landfill, Detailed Site Investigation, 28 June 2021.
[2] New Zealand Motor Caravan Association, 2022. Assessment of Environmental Effects, 8 June 2022.

landfill cap should be reburied beneath 0.7 m of clean capping material or disposed of off-site at a licenced landfill facility.

Applicability of the NESCS

The DSI concludes that the proposal is a permitted activity under the NESCS as soil disturbance volumes are below permitted activity limits and no soil is to be disposed of off-site. However, it is considered that the change from agricultural to recreational land use constitutes a change in land use under the NESCS and is therefore a Controlled Activity under Regulation 9(3), subject to the adequacy of the DSI.

The DSI calculated the permitted soil disturbance volume based on an area of 3.8 ha. However, the AEE defines the site as the lease area of 0.83 ha. The AEE details an anticipated 534 m^3 of soil disturbance for earthworks associated with construction of the ring road and metalled parking areas. It does not detail the excavation required for the dump station. Based on an area of 0.83 ha, the permitted soil disturbance volume would be 415 m^3. A cut and fill plan should be provided to allow for a more accurate calculation of soil disturbance volumes and assessment of whether the soil disturbance complies with the permitted activity threshold in the NESCS. Based on the information provided to date, the soil disturbance is a Controlled Activity under Regulation 9(1), subject to the adequacy of the DSI.

As the proposal includes excavation into the landfill cap, there is a potential that the integrity of the cap may be compromised. 4Sight recommend that an assessment against Clause 8(3)(g) of the NESCS be undertaken to identify whether the proposed work will affect the landfill containment.

Recommendations

4Sight recommends that the following information gaps are addressed prior to granting consent to ensure the requirements of the NESCS and CLMGs no. 1 and 5 are met:

- An assessment of landfill gas should be undertaken to assess the risk to site users. An assessment of potential PAH contamination in capping soil should also be undertaken;
- A cut and fill plan should be provided, detailing the areas of excavation and anticipated excavation volume;
- An assessment of the potential for the proposed work to compromise the landfill cap should be undertaken to determine whether the proposal triggers a consent under Clause 8(3)(g); and
- A consent should be sought in accordance with the NESCS due to the change in land use from agricultural to recreational.

The following consent conditions are recommended:

- A Contaminated Site Management Plan (CSMP) shall be prepared by a SQEP to be implemented during construction of the motor caravan park facility;
- The CSMP shall include accidental discovery protocols detailing how a SQEP shall be engaged if any landfill material is identified during site works;
- Any excavation to a depth greater than 0.7 m bgl shall be overseen by a SQEP;
- Any soil removed from the site shall be disposed of at a suitably licenced landfill facility; and
- An Ongoing Site Management Plan (OSMP) shall be developed by a SQEP detailing ongoing management procedures to protect site users from contaminated material. The OSMP shall be prepared in accordance with Contaminated Land Management Guideline No. 1 (MfE, 2021) and shall contain the following, at a minimum:
  - Identify areas of historic landfill material and relevant background information;
  - Procedures for protection and regular inspection of the landfill cap;
  - Any recommended landfill gas management practices identified in the landfill gas risk assessment; and
  - Any ongoing landfill monitoring required in accordance with existing closed landfill management consent conditions.

Memo prepared by:

Samantha Iles

Senior Environmental Consultant
4Sight Consulting Ltd

Memo reviewed by:

James Blackwell CEnvP SC (No. 41083)

Principal Land and Water Quality Consultant
4Sight Consulting Ltd

APPENDIX B – WDC GAS ASSESSMENT REQUIREMENTS

Te Awamutu Closed Landfill Gas Assessment

Email 20 Jan 2023 from Craig Inskeep (Waipa Council Resource Consent Consultant) to NZMCA

Hi Michael, Ray and Alan

Happy new year to you all trust that you had a nice Christmas and hopefully you manged some time away from home base finding some sun along the way.

Alan, I understand from Rayya that you are now the point of contact for the NZMCA resource consent application for Pirongia Road Te Awamutu following Rayya's departure at the end of last year, welcome and I look forward to connecting directly when appropriate.

At the end of last year I managed to connect with Samantha regarding the queries relating to the landfill gas etc. I would like to use this email to respond to the questions raised and provide further clarification. My apologies for the length of the proceeding email but I want to be clear with the information and key messages to hopefully assist the NZMCA with your application and I trust that the information here with will go some way to assist in clarifying what is still required in relation to the progression of the consent application for the site.

Reflection on process to date

The application by NZMCA for resource consent and Assessment of Environmental Effects, 8 June 2022 relates to the Te Awamutu closed landfill site. Landfill sites are classified as a HAIL activity (G3 – Landfill Sites). An assessment under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations (NESCS) is therefore needed to give council confidence that any risks are appropriately managed in relation to human health and possible exposure pathways.

In the original NZMCA application, a Detailed Site investigation (DSI) was included as prepared by WSP in support of the application. The DSI was quite limited in its scope and focused primarily on contaminated soils confirming that contaminants in soil exceed background concentrations however that disturbance volumes are below the permitted activity threshold for the overall site. Details on Polycyclic Aromatic Hydrocarbons (PAHs) were also not included as part of the assessment, PAHs are a common contaminant of concern associated with landfills. Whilst this is DSI approach is considered generally acceptable for the soils assessment (with some additional commentary around the PAH levels not previously provided) conditions could be considered, however the DSI is also notably very light on details regarding the historic landfill which for the sites is important aspect of the historical use and the primary reason for potential contamination. Further detail was expected in relation to the former operational landfill management, landfill contents, capping and ongoing closed landfill management and the possibility for landfill gas emissions. No field investigation records were provided for gas monitoring during the hand auger investigations of the site meaning limited reliance can be placed on this information.

The WSP DSI also recommended further investigation of landfill gas to fully characterise the risk and risk management which acknowledges the limitations of the previous assessment and is the aspect that we are also requesting. The site is currently used for stock grazing. The proposal is a change from agricultural to recreational activities which also constitutes a change in land use under the NESCS as people will now be occupying the space and we therefore disagree with the permitted activity status identified in the DSI. A further consent under the NESCS is necessary as a Discretionary activity(pending investigation). This has been confirmed by 4Sight Consulting Ltd (4Sight) who were engaged by Waipa District Council (WDC) as the technical reviewer of the DSI and NESCS and are providing technical advice to Council. As we are assessing the application and the potential effects in relation to the resource consent, please be aware that Samantha in her technical capacity and advisory role to council needs to maintain a level of independence and therefore cannot directly advise on the landfill gas risks as this places undue liability on the Council as the regulator.

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Landfill cap and Landfill gas

The integrity of the landfill cap remains of high importance for this site. Although proposed excavations are relatively minor in relation to the proposed activities and have been restricted to the formation of the access tracks and landscaping there is still the need for this to be assessed and the risk to site users quantified and appropriately manged. This is particularly relevant to the soil disturbance for the excavation of the dump station area which is likely to involve deeper excavations and also the change in use associated with the parking of motorhomes and their collective mass on the capping material. These aspects need further consideration by a Suitably Qualified and Experienced Contaminated land Practitioner. It is also on this basis that we have requested further information in relation to the landfill aspects throughout the consent process to date and, sufficient information is needed to confirm that the risk to human health is appropriately low and is managed effectively in relation to the proposed activities. This is not simply a regulatory approach as the NESCS is intended to ensure the health and safety of the users for the duration for the activity proposed , which in this case will be your club members.

We acknowledge the additional research and efforts/ information provided by Ray which has assisted with some of the site background and has filled in some of the gaps. The monitoring data available for the site is also limited as it provides some records for properties adjacent to the landfill to assess for potential lateral migration of landfill gas and no data is included on landfill gas assessment at the landfill itself from fugitive emissions through the cap which can vary across the site but up until now has had no direct reason to be monitored as the use of the site has been pastural farming. Having considered the information provided, we unfortunately are unable to reach a position of an informed assessment and as such we also need a further technical assessment by a **Suitably Qualified and Experienced Contaminated land Practitioner (SQEP) with expertise in landfill assessment and landfill gas management**. This aspect is identified by the **NECES legislation** through the guidance notes and is needed to support the application and additional NESCS consent.

The SQEP will complete an assessment of how landfill gasses will be considered at the site based on the historic details of the closed landfill, consideration of any excavations (location and depth) and volume of materials and provide recommendations for how these will be managed and monitored at the site and what trigger are appropriate (if required). The SQEP assessment should also include an assessment against clause 8 (3)(g) of the NESCS and, confirm no new pathways for migration of contaminant are generated through the development. Some indication of the level of Monitoring/ inspection of the landfill cap integrity will also be needed as part of an overall site management plan. The current application would remain on hold until this assessment is provided.

Consent approach

In the previous conditions as per my previous email, we also considered the option of deferring the assessment at NZMCA's request until a later date, whilst this is a possibility, this is not really our preferred approach as we can only assess this against your application details and without the assessment we would need to make suitable allowance for any eventuality and assume worst case. At this stage we don't fully understand the level of risk and as such this is reflected in the conditions provided for your consideration which are suitable conservative and reflect a risk based approach. As such it may be more efficient and appropriate to complete now on the basis of the following:

If the qualitative assessment is undertaken and the risks are considered low and determined to be an acceptable level of risk, - great we can then move forward on that basis likely with lesser conditions in relation to landfill gas management.

If the assessment considers the risks are higher, then your SQEP can advise on the best course of action i.e. a further quantitative assessment to confirm the risk and provide recommendations to council as to how this can be appropriately managed through a site management plan and or further monitoring.

If you decide to proceed with the delayed approach and proceed with a discretionary NESCS consent without the supporting assessment. this is an option too, but would require you to adopt the conditions as part of your application. Please also note also that this assessment would still be required ahead of the operation of the activities on site.

Other matters

In relation to other matters I acknowledge that amendments have been made to the layout and landscaping to accommodate concerns of neighbouring parties and this landscaping as proposed seems appropriate in the context of the site development and from the information provided will provide an increase in overall amenity. I am also of the view that the additional information around sight lines will be useful to progress the discussions with the adjoining parties.

In my view, the two adjoining parties previously identified and included below still remain as affected parties due to the changes in landuse within the rural zone which changes to the occupancy of the area for a recreational activity, and the increase in vehicle movements associated with the site and as such affected party approvals should be sought in support of the application. If following further consultation, their approvals are unable to be obtained then the option of a limited notification process is also available to you to advance the application.

Parties identified:

• 4 Pirongia Road – Lot 1 DPS 62851, John D Bosson & Jean P Bosson

• 5/28 Pirongia Road – Lot 2 DPS 92516 Colin and Rochelle Old

I trust that the above information is helpful and provides a clear direction in relation to the application and assessment.

I would be happy to discuss the above with you should you have any further queries, or would like to discuss directly.

Quentin is currently away on leave having a well-deserved break, but returning at the end of the month.

Kind Regards

Craig

Craig Inskeep

Associate Planner

Beca

Phone: +64 7 8383828

APPENDIX C – HISTORIC AERIAL IMAGERY

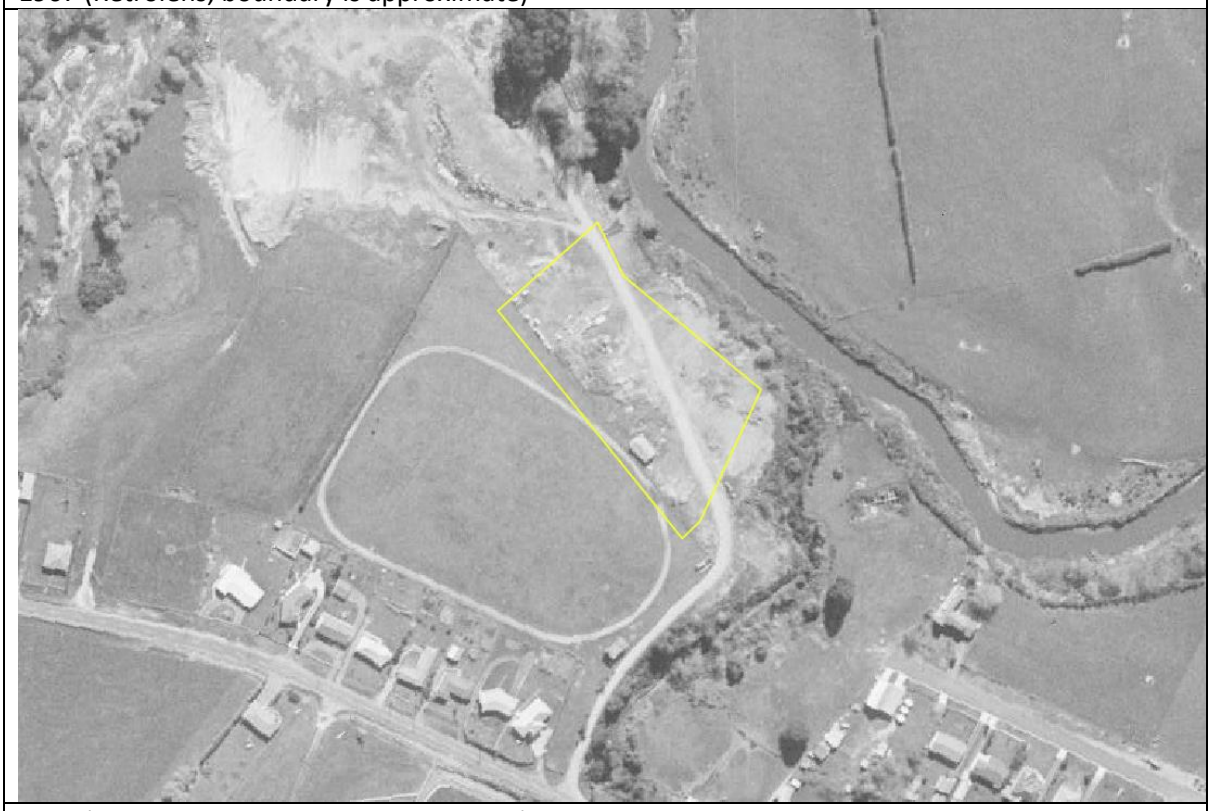
HD2798 – Te Awamutu South Closed Landfill historical aerials

1961 (Retrolens, boundary is approximate)

1966 (Retrolens, boundary is approximate)

HD2798 – Te Awamutu South Closed Landfill historical aerials

1967 (Retrolens, boundary is approximate)



1971 (Retrolens, boundary is approximate)

HD2798 – Te Awamutu South Closed Landfill historical aerials

1974 (Retrolens, boundary is approximate)

1979 (Retrolens, boundary is approximate)

HD2798 – Te Awamutu South Closed Landfill historical aerials

1995 (Retrolens, boundary is approximate)

APPENDIX D – HISTORIC MONITORING EVENTS

ox Street
Private Bag 3057, Waikato Mail Centre,
Hamilton 3240, New Zealand

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TO	David Totman
COPY	File
FROM	John West
DATE	17 December 2008
PROJECT NO	3-37884.00
LAB REF NO	08/393/001
SUBJECT	**Gas Monitoring**

David

Please find attached the bore logs and site plan for the Te Awamutu gas bores installed on the 5th December 2008.

Please contact me if you have any further queries.

Regards

John West

AUGER INVESTIGATION TEST REPORT

Project :	Te Awamutu Closed Landfill
Location :	Pirongia Road
Client :	Opus International Consultants Ltd Hamilton
Contractor :	N/A
Co-ordinates :	E 2712395
	N 6353234
Water level (m) :	Not encountered
Reduced level (m) :	N/A

Project No :	3-37884.00
Lab Ref No :	08/393/003
Client Ref No :	TGB 1

Test Results

Depth (m)	Shear Strength (kPa)	Sample Details	Material Description
0			Brown SILT, minor fine Sand, dry, soft, non plastic.
0.20			Orange brown SILT, some fine Sand, dry, firm, non plastic.
0.60			Dark orange brown fine to coarse SAND, some fine rounded Gravel, dry, medium dense, non plastic.
1.10			Grading to medium SAND, trace of Silt.
1.50			Dark orange fine SAND, trace of fine Gravel, dry, medium dense, non plastic.
1.70			Orange brown Silty CLAY, moist, firm, highly plastic (thin lense).
1.80			Dark orangey brown Silty medium to coarse SAND, some fine rounded Gravel, moist, medium dense, non plastic.
2.00			Brown / orange flecked SILT, minor Clay, soft, moist, slightly plastic.
2.40			Dark orangey brown Silty medium to coarse SAND, some fine rounded Gravel, moist, medium dense, non plastic.
2.60			Brown / orange flecked SILT, minor Clay, soft, moist, slightly plastic.
3.00			End of Auger.

Test Methods	Notes
Field Description of Soils and Rocks in Engineering Use, NZ Geomechanics Society	IANZ accreditation does not apply to material descriptions

Date tested : 5/12/08
Date reported : 17/12/08

Approved

Designation : *Senior Civil Engineering Technician*
Date : 17/12/08

Opus International Consultants Limited
Hamilton Laboratory
Quality Management Systems Certified to ISO 9001

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Website www.opus.co.nz

AUGER INVESTIGATION TEST REPORT

Project :	Te Awamutu Closed Landfill
Location :	Pirongia Road
Client :	Opus International Consultants Ltd Hamilton
Contractor :	N/A
Co-ordinates :	E 2712336
	N 6353309
Water level (m) :	Not encountered
Reduced level (m) :	N/A

Project No :	3-37884.00
Lab Ref No :	08/393/003
Client Ref No :	TGB 2

Test Results

Depth (m)	Shear Strength (kPa)	Sample Details	Material Description
0			Dark brown SILT, moist, soft, non plastic.
0.20			Orange brown SILT, trace of fine Sand, moist, soft, non plastic.
0.80			Orange brown fine to coarse Silica SAND, moist, medium dense, non plastic.
1.00			Orange brown fine to coarse Silica SAND, some fine rounded Gravel, moist, medium dense, non plastic.
1.40			Dark orange brown fine SAND, some fine rounded Grave, moist, loose, non plastic.
1.70			Light orange brown / orange flecked SILT, trace of Clay, wet, soft, slightly plastic.
2.70			Light yellowish brown SILT, trace of fine to medium Sand, wet, soft, slightly plastic.
2.90			Light yellowish brown SILT, some Clay, wet, soft, slightly plastic.
3.00			End of Auger.

Test Methods	Notes
Field Description of Soils and Rocks in Engineering Use, NZ Geomechanics Society	IANZ accreditation does not apply to material descriptions

Date tested : 5/12/08
Date reported : 17/12/08

Approved

Designation : *Senior Civil Engineering Technician*
Date : 17/12/08

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GAS BORE TESTING
TEST REPORT

Project :	**Te Awamutu Closed Landfill**
Location :	**Closed Landfill**
Client :	**Opus Hamilton**
Contractor :	**NA**
Sampled by :	**E J West**
Date sampled :	**12/04/10**
Sampling method :	**In House**
Sample description :	**Gases**
Sample condition :	**NA**

Project No :	**3-37844.00**
Lab Ref No :	**10/859/001**
Client Ref No :	

Test Results

Bore No		**TGB2**
Methane (CH_4)	%	**0.0**
CO_2	%	**0.4**
O_2	%	**19.3**

Date tested : 12/04/09
Date reported : 13/04/09

Approved

Designation : *Senior Civil Engineering Technician*
Date : 14/04/10

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GAS BORE TESTING
TEST REPORT

Project :	**Te Awamutu Closed Landfill**
Location :	**Closed Landfill**
Client :	**Opus Hamilton**
Contractor :	**NA**
Sampled by :	**E J West**
Date sampled :	**25/03/11**
Sampling method :	**In House**
Sample description :	**Gases**
Sample condition :	**NA**

Project No :	**3-37844.00**
Lab Ref No :	**10/859/001**
Client Ref No :	

Test Results

Bore No		TGB1	TGB2
Methane (CH_4)	%	0.0	0.0
CO_2	%	0.2	1.4
O_2	%	18.9	6.8

Date tested : 25/03/11
Date reported : 25/03/11

Approved

Designation : *Senior Civil Engineering Technician*
Date : 25/03/11

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GAS BORE MONITORING
TEST REPORT

Project :	**Te Awamutu Closed Landfill**	Barometric pressure:			
Location :	**Te Awamutu**	Before Sampling:	**1011**	**(mb)**	
Client :	**Waipa District Council**	After Sampling:	**1011**	**(mb)**	
Sampled by :	**E J West**	Start of Sampling:	**6:10**	**pm**	
Date Sampled :	**22/9/11**	End of Sampling:	**6:30**	**pm**	

Project No :	**3-37884.00**
Lab Ref No :	**11/848/004**
Client Ref No :	

Test Results

Bore No :	**TGB1**				
	1 Minute	2 Minutes	3 Minutes	4 Minutes	5 Minutes
CO_2 (%)	**1.7**	**1.8**	**1.8**	**1.8**	**1.8**
CH_4 (%)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Bore No :					
	1 Minute	2 Minutes	3 Minutes	4 Minutes	5 Minutes
CO_2 (%)					
CH_4 (%)					

Bore No :	**TGB2**				
	1 Minute	2 Minutes	3 Minutes	4 Minutes	5 Minutes
CO_2 (%)	**1.3**	**1.9**	**2.0**	**2.0**	**2.1**
CH_4 (%)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Bore No :					
	1 Minute	2 Minutes	3 Minutes	4 Minutes	5 Minutes
CO_2 (%)					
CH_4 (%)					

Bore No :					
	1 Minute	2 Minutes	3 Minutes	4 Minutes	5 Minutes
CO_2 (%)					
CH_4 (%)					

Bore No :					
	1 Minute	2 Minutes	3 Minutes	4 Minutes	5 Minutes
CO_2 (%)					
CH_4 (%)					

Date tested : 22/09/11
Date reported : 23/09/11

Approved

Designation : *Senior Civil Engineering Technician*
Date : 23/09/11

PF-LAB-006 (18/12/2010)

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APPENDIX E – SITE PHOTOS

1 – Looking northwest from entranceway

2 – Looking north from entranceway

3 – Looking northwest along riparian planting belt

4 – Looking southeast from riparian planting belt

5 – Looking northwest along the Mangapiko Stream

6 – Looking southeast along the Mangapiko Stream from northernmost end of site

7 – Looking south along site from northeastern perimeter of site

8 – Looking south along site from northernmost corner of site

APPENDIX F – SAMPLING LOCATIONS

CLIENT

NZ Motor Caravan Association

0 10 20 30 40 50 m

Scale: 1:1500

TITLE

TE AWAMUTU CLOSED LANDFILL GROUND GAS SAMPLING LOCATIONS

GENERAL NOTES AND DISCLAIMER

1. Coordinates are in NZTM
2. Imagery and cadastral information sourced from LINZ. Crown copyright reserved
3. Areas and dimensions are approximate only, any use or reliance on this plan is at the users risk

DRAWN	C.GRAHAM	17/04/23
CHECKED	P.GIBBINS	17/04/23
LOCATION	TE AWAMUTU	
JOB NUMBER	HD2798	

REV	BY	CHK'D	DATE

DRAWING No: HD2798-101 | SHEET: 1 | REVISION: 0

APPENDIX G – FIELD SHEETS

TE AWAMUTU SOUTHERN LANDFILL - LFG MONITORING 27 MARCH 2023

Landfill gas monitoring undertaken during following conditions:

- Stable/slightly falling barometric pressure of 1013mb to 1011mb
- No rain
- No wind
- Some light rain night prior; no standing water/puddles on site; ground conditions unsaturated

Note the “cap” highly variable consistency, with considerable sand content in some locations and minimal clay content. Considered that the “cap” would provide relatively low resistance to any landfill gas flow and could expect advection of gas through the “cap”.

Monitoring location	Methane (%v/v)	Carbon dioxide (%v/v)	Oxygen (%v/v)	Hydrogen sulphide (ppm)	Carbon monoxide (ppm)	Flow rate (l/hr)
HA1 (0.5m)	0	0.2	19.4	0	0	0.6
HA2 (0.5m)	0	0.3	19.6	0	0	0.5
HA2 (1.2m)	0	0.2	20.0	0	0	0.5
HA3 (0.5m)	0	0.4	20.1	0	0	0.6
HA3 (1m)	0	0.3	20.3	0	0	0.6
HA4 (0.5m)	0	0.2	20.4	0	0	0.4
HA5 (0.5m)	0	0.2	20.0	0	0	0.4
HA6 (0.5m)	0	0.3	20.2	0	0	0.4
HA6 (1m)	0	0.4	20.3	0	0	0.4
HA7 (0.5m)	0	0.4	20.5	0	0	0.3
HA7 (1m)	0	0.2	20.7	0	0	0.3
HA8 (0.4m)	0	0.4	20.8	0	0	0.2
HA9 (0.5m)	0	0.3	20.9	0	0	0.4
HA9 (1m)	0	0.1	21.0	0	0	0.3
HA10 (0.5m)	0	0.2	20.8	0	0	0.3
HA10 (1m)	0	0.1	20.8	0	0	0.3

APPENDIX H – BOREHOLE RETRIEVED MATERIAL

HA01 0-500mm bgl

HA02 0-500mm bgl

HA02 0-1200mm bgl

HA03 0-500mm bgl

HA01 0-1000mm bgl

HA04 0-500mm bgl

HA05 0-500mm bgl

HA06 0-500mm bgl

HA01 0-1000mm bgl

HA07 0-500mm bgl

HA07 0-1000mm bgl

HA08 0-400mm bgl

HA09 0-500mm bgl

HA09 0-1000mm bgl

HA10 0-500mm bgl

HA10 0-1000mm bgl

APPENDIX I – SITE MANAGEMENT PLAN

Works monitoring

Dump Station

During soil excavation for the development of the dump station, instantaneous landfill gas monitoring will be undertaken by the SQEP or SQEP representative. The following requirements apply:

- No person shall enter any excavation prior to landfill gas monitoring
- Continuous monitoring for landfill gas and shall be made during service and foundation excavations if workers are required to enter an excavation
- Worksafe confined spaces entry permitting and requirements must be adhered to (if applicable)

The following action levels will be applied for the continuous gas monitoring. If any of the action levels are triggered, works will immediately stop, and the SQEP will be consulted. Works will only re-start once the SQEP is satisfied it is safe to do so.

I.1. Action Levels for landfill gas

Vapour	Action Level
Methane	5% LEL (0% LEL for hot works, including piling and mechanical excavation)
CO_2	0.5%
O_2	>19.5%
H_2S	5ppm

No landfill gas monitoring is required to be undertaken during the construction of the metal access roads and parking areas, provided excavations associated with these works do not exceed 300mm bgl.

Future works

For any future works requiring excavation exceeding 300mm bgl, the SQEP should be consulted, and an assessment made whether landfill gas monitoring is required. If the SQEP determines monitoring is required, the requirements and action levels in the above section will be applied.

Erosion and sediment control

Erosion and Sediment controls will be undertaken in accordance with industry best practice, including the commonly used Waikato Stormwater Management Guideline.

General erosion and sediment control measures require site workers to:

- avoid working in rain likely to cause significant sedimentation or erosion
- install silt fences and runoff diversion bunds to capture sediment in surface water runoff
- regularly check erosion and sediment controls to ensure they are in good working condition
- remove and properly dispose of any sediment that breaches stormwater control systems
- inspect and repair stormwater controls and erosion and sediment controls, after rain events

- excavated material in stockpiles material needs to be covered, except when material is being added or removed
- place stockpiles in areas where runoff can be controlled

controls will be put in place before excavation works begin. This ensures that the generation of potentially contaminated sediment and stormwater during development is minimised and managed within the works area. Excavations are to be stabilised as soon as possible once completed.

Soil Disposal

Any soil for disposal off site will be pre-arranged with the disposal facility. The contractor will seek approval from the landfill disposal site prior to transport by supplying a waste characterisation report and/or lab data. Soils on the site cannot be considered cleanfill unless further analysis is undertaken and must be sent to a specialist facility (i.e. landfill or managed fill). The acceptance criteria for landfills and managed fills are generally defined by the consent conditions for the individual disposal sites.

Suitable tracking documentation for all material taken off site, including weighbridge tonnage, will be provided to the project manager for recording purposes.

Monitoring requirements

After the NZMCA park construction works are completed, monitoring will be undertaken by Waipa District Council as per their normal monitoring schedule. No additional ongoing monitoring is required as part of this ongoing management plan

Other matters

- Deep-rooting vegetation may not be grown within the area of the landfill cap