BEFORE INDEPENDENT HEARING COMMISSIONERS APPOINTED BY CANTERBURY REGIONAL COUNCIL AND WAIMAKARIRI DISTRICT COUNCIL

IN THE MATTER	of the Resource Management Act 1991 (**RMA** or **the Act**)
AND	
IN THE MATTER	of the Waimakariri River Regional Plan (**WRRP**); the Canterbury Land and Water Regional Plan (**LWRP**); the Proposed Plan Change 7 to the LWRP (**pPC7**) and Proposed Plan Change 2 to the WRRP (**pPC2**)6; the Canterbury Air Regional Plan (**CARP**) and the Waimakariri District Plan (**WDC**)
AND	
IN THE MATTER	of applications to the Canterbury Regional Council by **Woodstock Quarries Limited** for various resource consents to establish and operate a hard rock quarry and a landfill (**CRC214073-CRC214077)**
AND	
IN THE MATTER	of an application to the Waimakariri District Council by **Woodstock Quarries Limited** for resource consents to establish a landfill and associated earthworks at 513 Trig Road within an area currently being used as a quarry (**RC215276 / 221101189245**).

RIGHT OF REPLY EVIDENCE

OF MARTIN JOHN PINKHAM FOR THE APPLICANT

29 APRIL 2024

Presented for filing by:
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1 My name is Martin John Pinkham. A full description of my qualifications and experience can be found in my Statement of Primary Evidence.

2 I have read the Environment Court's Code of Conduct and agree to comply with it. The matters addressed in my evidence are within my area of expertise. However, where I make statements on issues that are not in my area of expertise, I will state whose evidence I have relied upon. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in my evidence.

3 I provide this further statement of evidence in reply to matters that have been included in the Supplementary Section 42A Report of Tim Johnston dated 19 April 2024 and the Reponse to Queries of Hearing Panel of Stewart Fletcher dated 19 April 2024.

Supplementary Section 42A Report of Tim Johnston dated 19 April 2024

4 In paragraphs 10 to 15 Mr Johnston notes the following comments in Joint Witness Statement – Drawings, "*constructability remains a concern to CRC and OOCB technical experts".*

5 As noted in the evidence of Mr Pattle there are numerous examples of steep wall liner systems having been constructed in New Zealand, and there are numerous examples of double liner systems being constructed overseas. There are no components of the proposed double liner system that are not regularly constructed in New Zealand.

6 As shown on Figure 5-2 Liner Types in the WasteMINZ Technical Guidelines for Disposal to Land Revision 3.1 (September 2023), enclosed as Attachment 1, there are four possible variations for a Class 1 liner system, and the proposed double liner system is simply an advanced version of these.

7 The liner system for the Kate Valley Landfill was also a variation of the "standard" Class 1 liner system and consisted of the following components (from the top):

- Leachate collection layer
- Protection geotextile
- 1.5mm HDPE
- GCL
- 1.0mm HDPE
- 300mm Compacted Clay Layer

8 At the time this configuration was also considered to be "challenging" but was constructed without any issues. As an experienced landfill engineer and constructor it is my opinion that there are no aspects of the proposed liner systems that are beyond the scope of suitably experienced local civil contractors.

9 In paragraph 18 of Mr Johnston's evidence he has provided a table of recommendations proposing amendments to the proposed Conditions of Consent. I provide my comments to some of those matters in the table below:

Condition Number	**Mr Johnston's Recommendation**	**Response and Recommendation**
CRC214073, CRC214075, CRC214077		
10b)	Include a list of components of the landfill construction.	Agree. However, the list of components listed by Mr Johnston does not cover all possible components and could be confusing. The existing wording refers to the types of documentation required and is more appropriate.
13	Remove the requirement for a representive of Waimakariri District Council and Canterbury Regional Council to be members of the Community Liaison Group (CLG).	Agree. See further details in response to Mr Fletcher below.
20	Construction Environmental Management Plan timeframe to be defined for each stage of construction.	The existing requirements as detailed in the Objectives and Contents of the LMP clearly define the timetable for delivery of Management Plans.
43	Amendments to the requirements for the preparation of As Built drawings.	Agree. The proposed amendments are required due to change of design of the liner and leachate collection system.
71	Addition of "Total Arsenic" as a parameter to be tested.	Agree.
94	Replace "repaired" with remediated.	Agree.
101 (102A)	Addition of new condition regarding the use of stabilisers.	Agree. However, this condition should ideally be numbered 102A.
119	Delete conditions regarding civil emergencies.	Reject. See further details in response to Mr Fletcher below.
CRC214076		
15a	Revert to the previous wording of "Using water ~~while crushing and screening at all times and where required~~ for all	The previous wording was overly prescriptive and impractical. Under the previous wording it would have required crushing and screening operations to use water even it was

Condition Number	Mr Johnston's Recommendation	Response and Recommendation
	~~other~~ activities on site for dust suppression as required to ensure compliance with this resource consent;	raining or the source aggregate was wet. Conditions 6 and 7 of this consent set performance criteria that must be acheived and it is the responsibilty of the consent holder to meet these performance criteria.
30c	Delete condition regarding landfill gas generators.	Reject. Mr Johnston is incorrect stating that landfill gas (LFG) generators were not part of the application. The Enginering Report dated June 2022 provided details of the Landfill Gas strategy which included the provision for LFG generators. Conditions 30(a)(i) to a(v) are accepted performance criteria that apply to LFG Flare Stations and LFG Generators to ensure that there is no adverse air quality effects.

Reponse to Queries of Hearing Panel of Stewart Fletcher dated 19 April 2024

10 In paragraph 17 of Mr Fletcher's report he recommends that the current wording in Condition 1.35 be amended to remove the requirement for a representive of Waimakariri District Council and Canterbury Regional Council to be members of the Community Liaison Group (CLG).

11 I concur with Mr Fletcher's recommendation as the role of officers from Waimakariri District Council and Canterbury Regional Council are to independantly monitor the conditions of consent. In my experience it is helpful for Council officers to attend CLG meetings as they can provide the CLG members with helpful advice and assist in the interpretation of conditions of consent, and general planning matters.

12 In paragraphs 20 and 21 of Mr Fletcher's report he recommends that the current Condition 4.1 regarding civil emergencies be removed.

13 I was the General Manager of Canterbury Waste Services (operator of the Kate Valley Landfill) at the time of the 2010 and 2011 Christchurch earthquakes. I was instructed by a Civil Defence Controller to transport and dispose of waste to Kate Valley in breach of conditions of consent relating to hours of transport operation, transport routes, hours of landfill operation and the use of daily cover (as the

landfill was required to operate 24 hours per day). There are significant penalties for not following the instruction of a Civil Defence Controller and in the circumstances "time was of the essence".

14 Many months after the event the consent authorities realised that while a civil emergency was declared in Christchurch City a civil defence emergency was not declared in Hurunui District, the location of the Kate Valley Landfill. Following legal advice the Christchurch Ciry Council concluded that the best way to address this was to make submission requesting an Order in Council from Cabinet to effectively approve the breaches of conditions noted in the paragraph above. The CCC incurred considerable financial and human resources costs in preparing the submission and managing the process.

15 A similar situation could arise in a future civil emergency, which may include limited or no access to the Kate Valley Landfill. The provisions of proposed Condition 4.1 provide for a sensible regime to provide an essential service in the event of a future civil emergency, and should be retained.

Proposed Amendments to the Waste Acceptance Criteria

16 During the hearings process, experts acting for Canterbury Regional Council noted that WasteMINZ had published a new version of the of the WasteMINZ Technical Guidelines for Disposal to Land Revision 3.1 (September 2023). This updated version includes an update of Appendix D Class 1 Landfill Waste Acceptance Criteria (WAC) and Appendix I Prohibited Wastes, both of which are referenced in Schedule 1 Woodstock Landfill Waste Acceptance Criteria. I recommend that the Woodstock Landfill Waste Acceptance Criteria be amended to include the updated WasteMINZ documents.

17 An updated Schedule 1 Woodstock Landfill Waste Acceptance Criteria is enclosed as Attachment 2.

18 With the removal of PFAS from the WAC, and the very high cost of PFAS testing, it is my opinion that PFAS testing of the leachate need only be undertaken annually. I recommend that Condition 159 be amended as detailed below:

Condition Number	Existing Condition	Recommended Condition
CRC214073, CRC214075, CRC214077		
159	The Consent Holder must undertake six monthly sampling and testing for PFAS of the leachate, and provide a copy of the test results to the Canterbury Regional Council, Attention: RMA Monitoring and Regional Leader – Compliance Manager Monitoring within 14 days of the test results being produced.	The Consent Holder must undertake ~~six monthly~~ annual sampling and testing for PFAS of the leachate, and provide a copy of the test results to the Canterbury Regional Council, Attention: RMA Monitoring and Regional Leader - Compliance Manager Monitoring within 14 days of the test results being produced.

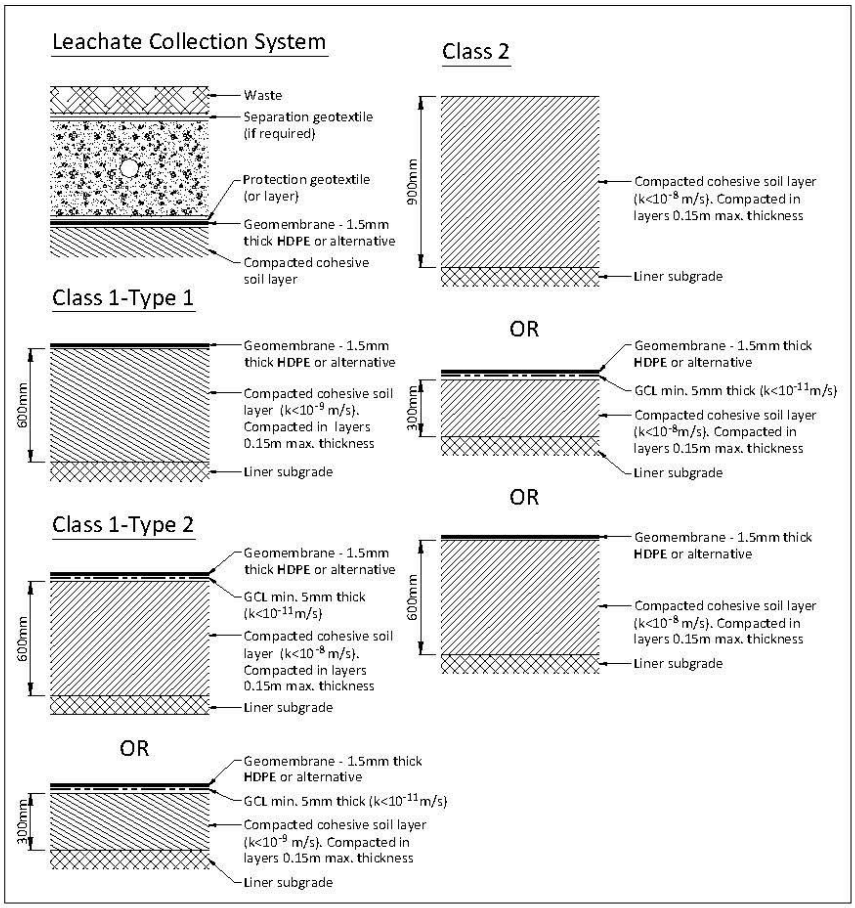
Martin John Pinkham

29 April 2024

Attachment 1 Figure 5-2 WasteMINZ Liner Types

wasteMINZ

Figure 5-2 Liner Types



Technical Guidelines for Disposal to Land – Revision 3.1

Attachment 2 Schedule 1:Waste Acceptance Criteria

Schedule 1: Waste Acceptance Criteria (WAC)

Woodstock Landfill

1 The Landfill shall accept the following wastes subject to visual inspection only:

a. Demolition waste that has been processed at an accredited demolition waste sorting facility with an appropriate licence from the relevant local authority **or** from a demolition site that has been subject to a Detailed Site Investigation by a Suitably Qualified and Experienced Contaminated Land Practioner (SQEP).

b. Treated wood: and

c. Putrescible material content comprising less than five percent by weight.

Waste may include a small proportion of hazardous waste that is not detectable using standard screening procedures at either transfer stations or other waste reception facilities. Such quantities are small - generally <200 ml/t, or <200 g/tonne. It also includes site-generated process sludges in comparatively small quantities (e.g., LCS condensate, evaporator sludges, sludges from leachate treatment and sediment control facilities).

2 Special Wastes shall only be accepted for disposal subject to:

a. An approval process that requires the issuing of a Special Waste Permit for each waste type, that details its nature, composition, and source in sufficient detail to demonstrate compliance with the special waste acceptance criteria; and

b. A Manifest for every load of waste related to the Special Waste Permit;

c. Meeting the Waste Acceptance Limits for the range of compounds as detailed in the schedule of Acceptable Waste (attached)

3 Not withstanding the requirements of WAC 1, Special Waste (being Solid Waste but which require special handling or testing or certification procedures), shall only comprise the following:

a. Any cleanfill material or soil sourced from any site on the Listed Land Use Register, or where a Hazardous Activities and Industries List activity (as defined by the Ministry for the Environment) subject to further testing.

b. Asbestos containing waste, which shall be handled in accordance with WasteMINZ publication “Waste industry guidelines to manage the collection, receipt, transport and disposal of asbestos waste – 2019” or any subsequent update to that publication.

c. Treated hazardous waste.

4 Special Wastes, shall only be accepted if their disposal has been pre-booked, and meeting the requirements of WAC 2. All Special Wastes shall be specifically buried on a load by load basis, and immediately covered.

5 The following wastes are not acceptable for disposal at the landfill:

a. Municipal solid waste

b. Putrescible waste, except for the proportion contained within the wastes listed in WAC 1.

c. Prohibited wastes as detailed on the schedule of Prohibited Wastes (attached).

d. Wastewater treatment plant (WWTP) sludges and other industrial sludges

e. Any liquid wastes as defined by condition 6 of this consent, with the exception of landfill leachate, site generated sludges, and landfill gas condensate;

f. Wastes or substances classified as explosive, flammable, oxidising or corrosive under the Hazardous Substances and New Organisms Act 1996.

g. Medical waste.

6 The definition of liquid waste shall be any waste that has a solids content of less than 20 percent, except such waste that passes the Paint Filter Liquids Test (EPA Method 9095A)

7 The Consent Holder shall maintain a record of:

a. The quantities and types of waste accepted at the Landfill; and

b. The actual location of the disposal of any special and odorous wastes.

A copy of this record shall be forwarded to the Canterbury Regional Council by 31 August each year, unless otherwise agreed in writing by the Canterbury Regional Council.

8 To minimise the potential for non-compliant waste to be disposed of at the Landfill, the following measures shall be taken:

a. A notice shall be clearly positioned at the Landfill entrance to identify wastes which are not accepted at the Landfill; and

b. Random inspections of incoming loads for the presence of hazardous waste shall be undertaken; and

c. The delivery of material onto the site shall be supervised by the consent holder or their representative at all times; and

d. Each waste generator delivering waste to the landfill site shall sign a written declaration or formal agreement with the consent holder that the deposited material meets the acceptance criteria specified in WAC 1 to 3 of this consent. These records shall be held at the landfill site and shall be provided to the Canterbury Regional Council on request.

9 The Consent Holder shall immediately notify the Canterbury Regional Council if any vehicle(s) is turned away from the Landfill with waste that does not comply with the waste acceptance criteria detailed in WAC 1 to 5 above. This notification shall include the vehicle registration number and source of the waste (if known).

10 The Consent Holder shall require that the waste generator's site investigations and remedial action plans for all contaminated soils received at the Woodstock Landfill be required to comply with the NZ Contaminated Land Management Guidelines No 5, and certified by a Suitably Qualified and Experienced Person (SQEP) as defined in NZ Contaminated Land Management Guidelines No 5.

11 If topsoil is imported to the site, for temporary stockpiling and use in the landfill capping layer at a later date, or imported to the site for direct use in the final capping layer, it shall be tested:

a) for the parameters:

i. Heavy metals (HM): Arsenic, Cadmium, Chromium (total), Copper, Lead, Nickel, Zinc and Mercury;

ii. Polycyclic Aromatic Hydrocarbons (PAH)

iii. Organochlorine Pesticides (OCP)

iv. Asbestos (semi-qualitative analysis)

b) at a rate of 1 test per 500 m3 of incoming material with a minimum of 3 tests.

c) in an IANZ certified laboratory

12 Topsoil shall only be accepted where it meets the following Topsoil Waste Acceptance Criteria (TWAC):

a. For HM, PAH and OCP: The Class 5 Waste Acceptance Criteria of the WasteMINZ Landfill Guidelines (2022).

b. Will not contain asbestos.

13 An annual Topsoil Acceptance Report shall be prepared and submitted to Environment Canterbury and Waimakariri District Council describing, as a minimum, the source of the topsoil, the volume of topsoil accepted, a summary table of all laboratory test results

Acceptable Wastes

This schedule of acceptable wastes is extracted from Appendix D of the WasteMINZ Technical Guidelines for Disposal to Land Revision 3.1 (September 2023), and applies to all wastes considered to be Special Waste that require testing. Leachability testing should be completed to provide assurance that waste materials meet the following recommended waste acceptance criteria. The waste acceptance criteria leachability limits represent maximum values which should not be exceeded and should be viewed as a minimum treatment specification for a landfill. If the following limits are exceeded by a leachate extract of the waste with respect to any of the listed constituents, then the material is not suitable for disposal to the facility.

Appendix D Class 1 Landfill Waste Acceptance Criteria (WAC)

For Class 1 Landfills, leachability testing should be completed to provide assurance that waste materials meet the following recommended WAC. The WAC leachability limits represent maximum values which should not be exceeded and should be viewed as a minimum treatment specification for a landfill.

If the following limits are exceeded by a leachate extract of the waste with respect to any of the listed constituents, then the material is not suitable for disposal to the facility.

Table D-1 Class 1 WAC for Inorganic and Organic Elements

Contaminant of concern	Unit	Maximum allowable TCLP concentration	Source
Inorganics			
Aluminium	mg/L	40	Module 2: Hazardous Waste Guidelines (MfE 2004)
Antimony	mg/L	0.6	Module 2: Hazardous Waste Guidelines (MfE 2004)
Arsenic	mg/L	5	USEPA Chapter 40 CFR
Barium	mg/L	100	USEPA Chapter 40 CFR
Beryllium	mg/L	10	Module 2: Hazardous Waste Guidelines (MfE 2004)
Boron	mg/L	20	Module 2: Hazardous Waste Guidelines (MfE 2004)
Cadmium	mg/L	1	USEPA Chapter 40 CFR
Chromium	mg/L	5	USEPA Chapter 40 CFR
Copper	mg/L	5	Module 2: Hazardous Waste Guidelines (MfE 2004)
Cyanides	mg/L	50	USEPA Chapter 40 CFR
Fluoride	mg/L	200	Module 2: Hazardous Waste Guidelines (MfE 2004)
Lead	mg/L	5	USEPA Chapter 40 CFR
Lithium	mg/L	20	Module 2: Hazardous Waste Guidelines (MfE 2004)
Mercury	mg/L	0.2	USEPA Chapter 40 CFR
Molybdenum	mg/L	10	Module 2: Hazardous Waste Guidelines (MfE 2004)

Contaminant of concern	Unit	Maximum allowable TCLP concentration	Source
Nickel	mg/L	10	Module 2: Hazardous Waste Guidelines (MfE 2004)
Selenium	mg/L	1	USEPA Chapter 40 CFR
Silver	mg/L	5	USEPA Chapter 40 CFR
Sulphides	mg/L	50	USEPA Chapter 40 CFR
Tin	mg/L	1000	Module 2: Hazardous Waste Guidelines (MfE 2004)
Vanadium	mg/L	2	Module 2: Hazardous Waste Guidelines (MfE 2004)
Zinc	mg/L	10	Module 2: Hazardous Waste Guidelines (MfE 2004)
Organics			
1,1,1 Trichloroethane	mg/L	200	Module 2: Hazardous Waste Guidelines (MfE 2004)
1,1,2 Trichloroethane	mg/L	500	Module 2: Hazardous Waste Guidelines (MfE 2004)
1,1,2,2 Tetrachloroethane	mg/L	50	Module 2: Hazardous Waste Guidelines (MfE 2004)
1,1-Dichloroethylene	mg/L	0.7	USEPA Chapter 40 CFR
1,2 Dibromo-3-chloropropane	mg/L	0.2	Module 2: Hazardous Waste Guidelines (MfE 2004)
1,2 Dichlorobenzene	mg/L	0.2	Module 2: Hazardous Waste Guidelines (MfE 2004)
1,2 Dichloroethene	mg/L	10	Module 2: Hazardous Waste Guidelines (MfE 2004)
1,2 Dichloropropane	mg/L	1	Module 2: Hazardous Waste Guidelines (MfE 2004)
1,2-Dichloroethane	mg/L	0.5	USEPA Chapter 40 CFR
1,3 Dichloropropene	mg/L	2	Module 2: Hazardous Waste Guidelines (MfE 2004)
1,4-Dichlorobenzene	mg/L	7.5	USEPA Chapter 40 CFR
2 Chlorophenol	mg/L	0.05	Module 2: Hazardous Waste Guidelines (MfE 2004)
2,4 Dichlorophenol	mg/L	0.05	Module 2: Hazardous Waste Guidelines (MfE 2004)
2,4,5-Trichlorophenol	mg/L	400	USEPA Chapter 40 CFR

Contaminant of concern	Unit	Maximum allowable TCLP concentration	Source
2,4,5-Trichlorophenoxypropionic acid	mg/L	1	USEPA Chapter 40 CFR
2,4,6-Trichlorophenol	mg/L	2	USEPA Chapter 40 CFR
2,4-Dichlorophenoxyacetic acid	mg/L	10	USEPA Chapter 40 CFR
2,4-Dinitrotoluene	mg/L	0.13	USEPA Chapter 40 CFR
Aniline	mg/L	0.2	Module 2: Hazardous Waste Guidelines (MfE 2004)
Benzene	mg/L	0.5	USEPA Chapter 40 CFR
Bromodichloromethane	mg/L	1	Module 2: Hazardous Waste Guidelines (MfE 2004)
Bromoform	mg/L	10	Module 2: Hazardous Waste Guidelines (MfE 2004)
Carbon disulphide	mg/L	3	Module 2: Hazardous Waste Guidelines (MfE 2004)
Carbon Tetrachloride	mg/L	0.5	USEPA Chapter 40 CFR
Chlordane	mg/L	0.03	USEPA Chapter 40 CFR
Chlorobenzene	mg/L	100	USEPA Chapter 40 CFR
Chloroform	mg/L	6	USEPA Chapter 40 CFR
Dibromochloromethane	mg/L	10	Module 2: Hazardous Waste Guidelines (MfE 2004)
Dichloromethane	mg/L	2	Module 2: Hazardous Waste Guidelines (MfE 2004)
Diethylphthalate	mg/L	100	Module 2: Hazardous Waste Guidelines (MfE 2004)
Dimethylphthalate	mg/L	400	Module 2: Hazardous Waste Guidelines (MfE 2004)
Endrin	mg/L	0.02	USEPA Chapter 40 CFR
Ethyl benzene	mg/L	50	Module 2: Hazardous Waste Guidelines (MfE 2004)
Heptachlor	mg/L	0.008	USEPA Chapter 40 CFR
Hexachloro – 1,3-butadiene	mg/L	0.5	USEPA Chapter 40 CFR
Hexachlorobenzene	mg/L	0.13	USEPA Chapter 40 CFR
Hexachloroethane	mg/L	3	USEPA Chapter 40 CFR

Contaminant of concern	Unit	Maximum allowable TCLP concentration	Source
Lindane	mg/L	0.4	USEPA Chapter 40 CFR
m-Cresol	mg/L	200	USEPA Chapter 40 CFR
Methoxychlor	mg/L	10	USEPA Chapter 40 CFR
Methyl ethyl ketone	mg/L	200	USEPA Chapter 40 CFR
Naphthalene	mg/L	10	Module 2: Hazardous Waste Guidelines (MfE 2004)
Nitrobenzene	mg/L	2	USEPA Chapter 40 CFR
o-Cresol	mg/L	200	USEPA Chapter 40 CFR
p-Cresol	mg/L	200	USEPA Chapter 40 CFR
Pentachlorophenol	mg/L	100	USEPA Chapter 40 CFR
Phenol	mg/L	40	Module 2: Hazardous Waste Guidelines (MfE 2004)
Polychlorinated biphenyls	mg/L	50	USEPA Chapter 40 CFR
Pyridine	mg/L	5	USEPA Chapter 40 CFR
Tetrachloroethylene	mg/L	0.7	USEPA Chapter 40 CFR
Toluene	mg/L	100	Module 2: Hazardous Waste Guidelines (MfE 2004)
Total cresol	mg/L	200	USEPA Chapter 40 CFR
Total halogenated compounds	mg/L	1000	USEPA Chapter 40 CFR
Total synthetic non-halogenated compounds	mg/L	10000	USEPA Chapter 40 CFR
Toxaphene	mg/L	0.5	USEPA Chapter 40 CFR
Tributyltin oxide	mg/L	3	Module 2: Hazardous Waste Guidelines (MfE 2004)
Trichloroethylene	mg/L	0.7	USEPA Chapter 40 CFR
Vinyl chloride	mg/L	0.2	USEPA Chapter 40 CFR
Xylene (m,o,p)	mg/L	100	Module 2: Hazardous Waste Guidelines (MfE 2004)

Polycyclic aromatic hydrocarbons (PAH)

These limits for PAHs have been taken from the Queensland Model Conditions for Landfills that are equivalent to the WasteMINZ Class 1 landfill classification.

Polycyclic aromatic hydrocarbons (PAH)	
Contaminant	**Maximum TCLP (mg/l)**
Anthracene	0.7
Benz (a) anthracene	0.05
Benz (c) phenanthrene	0.05
Benzo (a) pyrene	0.02
Benzo (b) fluoranthene	0.05
Benzo (k) fluoranthene	0.05
Chrysene	0.1
Dibenz (a,h) anthracene	0.02
Dibenz (a,h) pyrene	0.1
Dimethylbenz (a) anthracene	0.05
Fluoranthene	0.2
Indeno (1,2,3-cd) pyrene	0.1
Naphthalene	0.7
Phenanthrene	0.1
Pyrene	0.7
Total PAH	1

Prohibited Wastes

This schedule of Prohibited Wastes is an extract from Appendix I of the WasteMINZ Technical Guidelines for Disposal to Land Revision 3.1 (September 2023). Numbering and terminology used are generally consistent with the ANZECC classification system and refer in the first instance to untreated wastes. As the system contains both waste types and constituents, more than one category may be applicable to a particular waste and therefore all categories need to be checked to determine whether landfill disposal may be appropriate.

Appendix I Prohibited Wastes

Numbering and terminology used are generally consistent with the ANZECC classification system and refer in the first instance to untreated wastes. As the system contains both waste types and constituents, more than one category may be applicable to a particular waste and therefore all categories need to be checked to determine whether landfill disposal may be appropriate.

I.1 Waste Prohibited at All Landfills/Fills (Class 1, 2, 3, 4 or 5)

Table I-1 Prohibited Waste Characteristics

Waste code	Waste description
H1	Explosives
H2	Gases
H3	Flammable liquids
H4.1	Flammable solids
H4.2	Substances or wastes liable to spontaneous combustion
H5.1	Oxidising substances
H5.2	Organic peroxides
H6.2	Infectious substances
H7	Radioactive materials
H8	Corrosives
H10	Liberation of toxic gases in contact with air or water
H13	Capable, by any means after disposal, of yielding another material i.e., leachate which possesses any of the above characteristics

Table I-2 Waste Types which may Exhibit the above Characteristics

Waste code	Waste description
Cyanides, surface treatment and heat treatment	
A100	Cyanide containing waste from treatment of metals
A110	Cyanide containing waste
A120	Complexed cyanides
A130	Other cyanides

Waste code	Waste description
Acids	
B100	Sulfuric acid
B110	Hydrochloric acid
B120	Nitric acid
B130	Phosphoric acid
B140	Chromic acid
B150	Hydrofluoric acid
B160	Sulfuric/hydrochloric acid mixtures
B170	Other mixed acids
B180	Organic acids
Alkalis	
C100	Caustic soda, potash, alkaline cleaners
C110	Ammonium hydroxide
C140	Other (hazardous substances must be specified)
Inorganic chemicals	
D100	Metal carbonyls
D120	Mercury
D280	Alkali metals
D330	Sulphur
Reactive chemicals	
E100	Oxidising agents
E110	Reducing agents
E120	Explosives
E130	Highly reactive chemicals
Paints, lacquers, varnishes, inks, dyes, pigments, adhesives	
F200	Uncured adhesives or resins
Organic solvents	
G100	Ethers
G110	Non-halogenated (FP>61°C), n.o.s
G130	Halogenated (FP>61°C), n.o.s
G140	Halogenated (FP>61°C), n.o.s
G150	Halogenated n.o.s

Waste code	Waste description
G160	Wastes from the production and formulation of organic solvents
G180	Others (hazardous substances must be specified)
Pesticides	
H100	Inorganic, organometallic pesticides
H110	Organophosphorus pesticides
H180	Organic wood preserving compounds
H120	Nitrogen-containing pesticides
H130	Halogen-containing pesticides
H140	Sulphur-containing pesticides
H150	Mixed pesticide residues
H160	Copper-chrome-arsenic
H170	Other inorganic wood preserving compounds
Oils, hydrocarbons, emulsions	
J100	Waste mineral oils unfit for their original intended use (lubricating, hydraulic)
J110	Waste hydrocarbons
J120	Waste oils/water, hydrocarbon/water mixtures, emulsions (mainly oil and or hydrocarbons, i.e., >50%)
J130	Waste oils/water, hydrocarbon/water mixtures, emulsions (mainly water, i.e., >50%)
J140	Transformer fluids (excluding polychlorinated biphenyls [PCBs])
J150	Other (cutting, soluble oils)
J160	Tars and tarry residues (including tarry residues arising from refining)
Putrescible, organic wastes	
K100	Liquid animal effluent (poultry and fish processing)
K150	Liquid vegetable oils and derivatives
K170	Liquid animal oils and derivatives
K180	Abattoir effluent
K200	Food processing effluent
Industrial washwaters, effluents	
L100	Truck, machinery washwaters with or without detergents
L101	Car wash waters with or without detergents
L120	Cooling tower washwater
L130	Fire wastewaters

Waste code	Waste description
L140	Textile effluent
L150	Other industrial plant washdown water
Organic chemicals	
M100	PCBs and/or polyterphenyl (PCTs) and/or polybrominated biphenyls (PBBs)
M110	Equipment containing PCBs and/or PCTs and/or PBBs
M120	Solvents and materials contaminated with PCBs and/or PCTs and/or PBBs
M150	Phenols, phenol derivatives including chlorophenols
M160	Halogenated compounds n.o.s.
M170	Any congener of poly-chlorinated dibenzofuran
M180	Any congener of poly-chlorinated dibenzo-p- dioxin
M210	Organic cyanides
M250	Liquid surfactants and detergents
Chemical and pharmaceutical wastes	
R100	Infectious substances
R110	Pathogenic substances
R130	Cytotoxic substances
Miscellaneous	
T100	Waste chemical substances arising from research and development or teaching activities, which are not identified

I.2 Waste Possibly Suitable for Class 1 Landfill Disposal – Solids and Sludges

Table I-3 Characteristics of Wastes Possibly Suitable for Class 1 Landfill Disposal

Waste code	Waste description
H6.1	Poisonous substances
H11	Toxic substances (chromic or delayed effects)
H12	Eco-toxic

Table I-4 Waste Types which may Exhibit the Characteristics of Wastes Possibly Suitable for Class 1 Landfill Disposal

Waste code	Waste description
Alkalis	
C120	Waste lime and cement
C130	Lime/caustic neutralised wastes containing metallic constituents
Inorganic chemicals	
D110	Inorganic fluoride compounds
D120	Mercury compounds
D121	Equipment and articles containing mercury
D130	Arsenic, arsenic compounds
D140	Chromium, chromium compounds
D141	Tannery wastes containing chromium
D150	Cadmium, cadmium compounds
D160	Beryllium, beryllium compounds
D170	Antimony, antimony compounds
D180	Thallium, thallium compounds
D190	Copper compounds
D200	Cobalt, cobalt compounds
D210	Nickel, nickel compounds
D220	Lead, lead compounds
D230	Zinc compounds
D240	Selenium, selenium compounds
D250	Tellurium, tellurium compounds
D260	Silver compounds
D261	Photographic waste containing silver
D270	Vanadium, vanadium compounds
D280	Alkali metal containing compounds
D290	Barium, barium compounds
D310	Boron, boron compounds
D320	Inorganic non-metallic phosphorus compounds
D330	Inorganic sulphur containing compounds
D340	Other inorganic compounds and complexes

Waste code	Waste description
Putrescible, organic wastes	
K100	Animal residues (poultry and fish processing wastes)
K101	Scallop processing residues
K120	Grease interceptor trap waste – domestic
K130	Bacterial sludge (septic tank)
K132	Sewage sludge and residues
K140	Tannery wastes not containing chromium
K150	Vegetable oil derivatives
K160	Vegetable wastes
K170	Animal oil derivatives (e.g., tallow)
K180	Abattoir residues
K190	Wool scouring wastes
Organic Chemicals	
M130	Non-halogenated (non-solvent) n.o.s.
M140	Heterocyclic organic compounds
M190	Organic phosphorus compounds
M200	Organic sulphur compounds
M220	Organic isocyanates
M230	Amines and other nitrogen compounds (aliphatic)
M240	Amines and other nitrogen compounds (aromatic)
M260	Highly odorous (e.g., mercaptans, acrylate)
M270	Methacrylate compounds
M280	Other
Solid/sludge requiring special handling	
N100	Drums which have contained hazardous substances (and which have been triple rinsed)
N110	Containers and bags which have contained hazardous substances (hazardous substances must be specified)
N120	Contaminated soils (hazardous substances must be specified)
N130	Spent catalysts (contaminants must be specified)
N140	Fire debris
N150	Fly ash
N160	Encapsulated wastes

Waste code	Waste description
N170	Chemically fixed wastes
N180	Solidified or polymerised wastes
N190	Ion-exchange column residues
N200	Industrial waste treatment sludges and residues n.o.s.
N210	Residues from pollution control operations
N220	Asbestos (refer to the Management and Removal of Asbestos Approved Code of Practice, WorkSafe New Zealand 2016)
N230	Synthetic mineral fibres
Clinical and pharmaceutical wastes	
R120	Pharmaceutical and residues
R140	Wastes from the production and preparation of pharmaceutical
Miscellaneous	
T120	Scrubber sludge
T130	Photographic chemicals which do not contain silver
T140	Inert sludges/slurries (e.g., clay, ceramic suspensions)
T150	Used tyres/tyre wastes
T190	Other (hazardous substances must be specified)