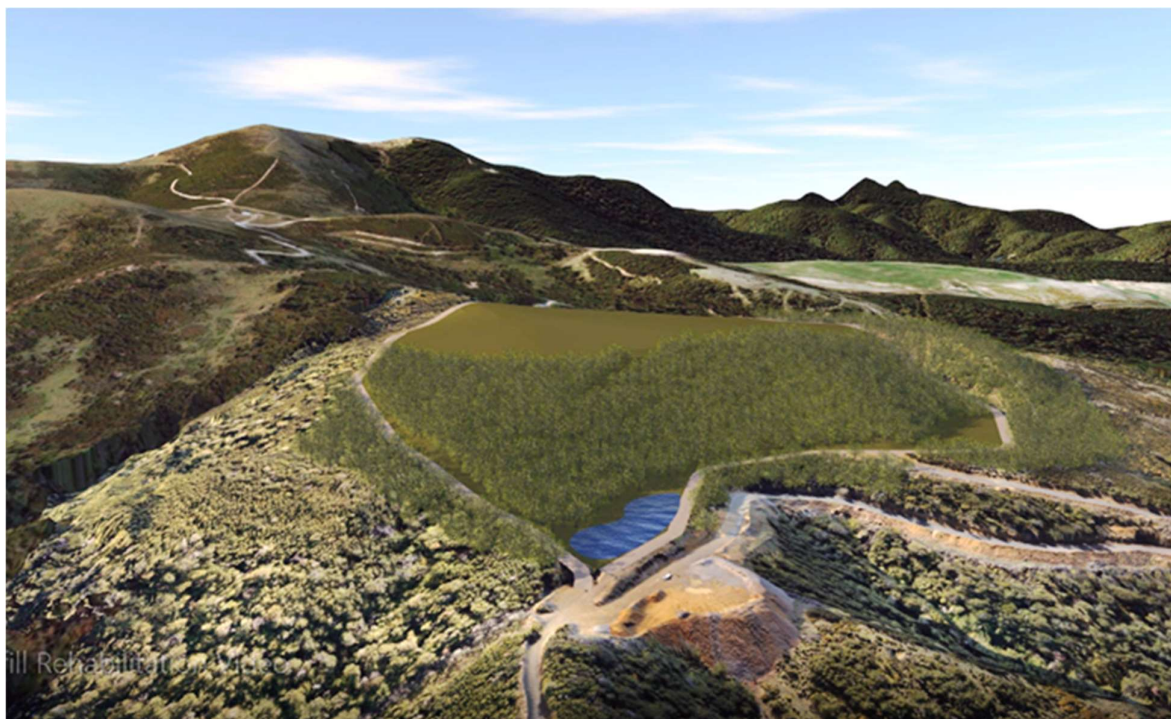


## **Woodstock Landfill**

# **Proposed Conditions of Consent**



**INDIGENOUS REGENERATION *through* INNOVATIVE LANDFILL PRACTICE**

**DOCUMENT OWNER**

Document Owner:	Woodstock Quarries Ltd
Document Name:	Woodstock Quarry Proposed Conditions of Consent

**DOCUMENT CONTROL**

Issue:	Date:	Prepared	Reviewed	Approved for Issue
1	8 April 2021	Martin Pinkham	Garry Blay	Darryn Shepherd
1	19 April 2021	Martin Pinkham	Garry Blay	Darryn Shepherd

## 1.0 Introduction

Woodstock Quarries Ltd (WQL) is proposing to construct and operate a Landfill (the landfill) located below Mt Wilson, approximately 16 km west of Oxford, North Canterbury.

## 2.0 Proposed Conditions of Consent

WQL will be responsible for the design, construction, operation, closure, and aftercare of the landfill. WQL seeks to ensure that the landfill is designed and operated in such way that any potential adverse human health and environmental effects are avoided, managed, or mitigated.

WQL is proposing the following conditions of consent for each of the consents required.

The reference in the table below is an interim reference until such time that Environment Canterbury issues a resource consent number.

**Table 1**      **Schedule of Consents**

Reference	Type	Name
WQL0	General	<ul style="list-style-type: none"><li>General Conditions that apply to all consents</li></ul>
WQL1	Land Use consent	<ul style="list-style-type: none"><li>Excavation of material (quarry rock) over an aquifer</li><li>Deposition of material (C &amp; D waste) over an aquifer within 5 metres of highest groundwater</li><li>Deposition of hazardous waste (contaminated soil) onto land where the contaminant may enter water</li></ul>
WQL2	Water permit	<ul style="list-style-type: none"><li>Drain water using subsoil drainage pipes</li></ul>
WQL3	Discharge permit	<ul style="list-style-type: none"><li>Discharge of clean stormwater and drainage water to land from a contaminated site</li><li>Discharge of landfill leachate back into landfill</li></ul>
WQL4	Discharge to air permit	<ul style="list-style-type: none"><li>Discharge landfill gas, leachate, dust, and odour to air from an industrial activity (quarry and landfill)</li></ul>

## **WQL0 General Conditions**

- 1 All works shall be undertaken generally in accordance with the consent application documents (where applicable), except where amendments are required by conditions of these consents. In the event of differences or conflict between the measures described in the documents, and the conditions, the conditions shall prevail.
- 2 Detailed designs of all works shall be forwarded to the Canterbury Regional Council prior to works commencing.
- 3 All investigations, design, supervision of construction, operation, monitoring, and aftercare shall be undertaken by a Chartered Engineer experienced in such works or works of a similar nature.
- 4 As-built drawings shall be forwarded to Canterbury Regional Council following completion of principal works and structures, which shall include the sedimentation ponds, toe bund, leachate collection system, landfill gas system, landfill access road, and landfill cells. These drawings shall include:
  - a. 0.5 metre contours for the liner base;
  - b. final elevations of the liner prior to placement of the leachate drainage layer and
  - c. spot levels to plus or minus 10 millimetres at leachate collection sump locations.

They shall also include copies of field records showing details of the exposed ground surface prior to liner placement, including a record of any sub-liner ground improvements undertaken.

- 5 A certificate signed by the person or persons responsible for designing the principal works and structures of the landfill or a competent person shall be submitted to the Canterbury Regional Council within one month of completion of the principal works and structures associated with the landfill to certify that the works were carried out in accordance with the design plans submitted, as required by Conditions (1) and (4) of this Schedule.
- 6 At least three months prior to landfilling activity commencing a Landfill Management Plan (LMP) shall be forwarded to the Canterbury Regional Council.
- 7 The LMP shall provide details of the procedures to be put into place to operate the Landfill in compliance with conditions of these consents and to minimise the potential for adverse effects due to the operation of the Landfill.
- 8 The Consent Holder, by 1 November of each year, shall complete a review of the Landfill Management Plan to ensure that management practices result in compliance with the conditions of these consents. Any proposed revisions shall be forwarded to Canterbury Regional Council and Waimakariri District Council.
- 9 The Consent Holder shall retain an appropriately experienced person to supervise the operation of the Landfill. That person shall compile an Annual Report on the operation of the Landfill, including:
  - the status of landfilling operations on the site and work completed during the preceding year;
  - any difficulties which have arisen in the preceding year and measures taken to address those difficulties;
  - activities proposed for the next year of the Landfill operation;
  - collated summaries and analyses of all monitoring and other data required under these consents, including all information relating to groundwater, surface water, odour, dust, litter, and noise; and
  - an outline of any short or long-term adverse effects that are likely based on monitoring results obtained

This report shall be forwarded to Canterbury Regional Council by 1 November each year, unless otherwise agreed

in writing with Canterbury Regional Council.

- 10** Prior to the placement of waste the Consent Holder shall provide and maintain in favour of Canterbury Regional Council a financial assurance (bond) which, in the event of default by the Consent holder would:
- I. Secure compliance with all the conditions of these consents and enable any adverse effects on the environment resulting from the Consent Holder's activities, and not authorised by a resource consent to be avoided, remedied or mitigated (Remedial action);
  - II. Secure the completion of rehabilitation and closure in accordance with the approved Aftercare section of the Landfill Management Plan (Closure):
  - III. Ensure the performance of any monitoring obligations of the Consent Holder under this consent, as well as any site aftercare obligations such as care of the landfill cap and pollution prevention infrastructure (Aftercare);
  - IV. Provide for reconstruction of the landfill landform in the event of a mass movement
  - V. Provide for early closure costs in the event of abandonment of the site
  - VI. The amount (quantum) of the bond may vary from time to time but at any given time shall be sufficient to cover the estimated cost at that time (including any contingency) of:
  - VII. Remediation of any adverse effect on the environment that may arise from the site. The estimated costs shall be determined by the Consent Holder by means of a quantitative risk assessment to ensure that the 90 percent confidence limit on remedial action costs is provided. An experienced environmental risk assessment practitioner shall conduct such a risk assessment. The risk assessment shall include (but not be limited to) the factors listed below, the likelihood of any of these events occurring and the likely remedial costs:
    - Excessive leachate seepage through liner;
    - Failure of leachate collection system
    - Escape of leachate from the leachate storage system;
    - Surface water contamination within or beyond the boundary of the premises;
    - Groundwater contamination within or beyond the boundary of the premises (except where the contamination is within a designated attenuation zone)
    - Illegal dumping of hazardous and/or inappropriate waste;
    - Instability of landfill batters;
    - Underground migration of landfill gas;
    - Significant and ongoing odour problems;
    - Failure of gas extraction system;
    - Landfill fires;
    - Erosion of landfill cap;
    - Failure of any of the sedimentation ponds;
    - Slipping/mass failure of the landfill mass;
    - Gross pollution of the adjoining environment, and
    - Failure to establish and or maintain vegetation cover on cap

- VIII Rehabilitation and closure of the site in accordance with the conditions of the consents. These works shall include:
- Capping and re-vegetation in accordance with the details of the Landfill Management Plan;
  - Installation of gas and leachate collection infrastructure where it is not installed progressively throughout the life of the landfill; and
  - Decommissioning of infrastructure no longer required. The cost estimate must provide for the rehabilitation of the largest area of the landfill that may be open (filled and uncapped) at any stage. In the event that capping materials are required to be imported to the site, the Consent holder shall allow for the cost of importation to be included in the estimate of costs.
- IX Monitoring and management of the site and its effects both before and after closure or abandonment of the site. In this context, closure shall mean completion of capping of the final landfill cell. The bond shall provide for the total area of landfill filled at a given time. The estimation of the bond for site monitoring and management costs shall consider (but not be limited to) the following aspects:
- Inspection of landfill cap and landfill infrastructure including leachate collection system;
  - Repair of landfill cap and infrastructure;
  - Landscape maintenance of vegetated landfill cap;
  - Leachate and stormwater treatment and/or disposal;
  - Decommissioning of leachate storage;
  - Maintenance of groundwater bores and gas collection wells
  - Ongoing extraction and management or usage of landfill gas; and
  - Monitoring program for:
    - a) Groundwater;
    - b) Surface water;
    - c) Leachate; and
    - d) Landfill gas.
- 11** The Consent Holders bond shall be in a form agreed between the Consent Holder and the Council and shall, subject to these conditions, be on terms and conditions agreed between them.
- 12** The Consent holders' bonds shall name the Councils as the party able to draw on the bond. The bond shall be available to the Councils regardless of whether it is required as a result of any deliberate or inadvertent act of the Consent holder or its agents.
- 13** The amount of the bond shall be initially set on the basis of cost estimates established by means of a risk assessment prepared by the Consent holder, which shall be submitted to the Councils for review and approval prior to the commencement of placement of refuse at the site. The amount of the bond must cover costs associated with the operational aspects, as indicated in Condition 10 above.
- 14** Should the Consent Holder and the Councils be unable to reach mutual agreement on the form, terms and conditions, or amount of the bond, then the matter shall be referred to arbitration in accordance with the provisions of the Arbitration Act 1996. Arbitration shall be commenced on advice by either party that the amount of the bond is disputed, such notice to be given within 14 days of receipt by the Councils of the amount of the

bond established by the Consent Holder. If the parties cannot agree upon an arbitrator within seven days of receiving advice that the amount of the bond is in dispute, then an arbitrator shall be appointed by the President of the Institute of Professional Engineers of New Zealand (IPENZ). Such arbitrator shall give an award in writing within 30 days after his/her appointment, unless both parties mutually agree that time shall be extended. The parties shall bear their own costs in connection with arbitration. In all other respects, the provisions of the Arbitration Act 1996 shall apply.

- 15** If the decision of the arbitrator is not made available by the 30<sup>th</sup> day referred to above, then the amount of the bond shall be fixed by the Councils, until such time as the arbitrator does make his/her decision. At that stage, the new amount shall apply. The Consent holder shall not place further refuse at the site if the variation of the existing bond or new bond is not provided in accordance with this condition.
- 16** The amount of the Consent holder's bond shall be reviewed every five years from the first placement of refuse at the landfill, by means of a risk assessment using the criteria in condition 10. More frequent reviews may be undertaken at the Councils discretion, in which case the Councils shall provide the Consent holder with no less than 30 days' notice in writing of the review. If, on review, the amount of the bond to be provided by the Consent holder is greater than the sum secured by the current bond, then within 30 days of the Consent holder being given written notice by Councils of the new amount to be secured by the bond, the Consent holder and the guarantor shall execute and lodge with the Councils a variation of the existing bond or a new bond for the amount fixed on review by the Councils. No further refuse shall be placed at the site if the variation of the existing bond is not provided in accordance with this condition.
- 17** The Consent holder may apply to have the bond amended, discharged or reviewed at any time, in which case the Council shall advise the Consent holder of its decision on the application within 60 days of it receiving the application. An application by the consent holder to amend the amount of the bond should be supported by a risk assessment carried out in accordance with the methodology detailed in condition 10.
- 18** The bond shall be maintained in favour of the Councils for a minimum period of 25 years following closure or abandonment of the landfill site. Closure shall mean completion of capping of the final landfill cell, or closure following abandonment prior to the final landfill cell being completed. If the landfill has been monitored and a risk assessment approved by the Councils affirms that there are no existing or potential adverse environmental effects from the landfill operation, then the Councils may at their discretion discharge the bond before the 25 year period has concluded. The bond period may at Council's discretion be extended beyond 25 years if a risk assessment to the satisfaction of Council conducted 25 years after landfill closure indicates that the landfill continues to pose a threat to the environment.
- 19** The following aspects shall be considered in a risk assessment determining whether to amend or discharge the Consent holder's bond:

  - Environmental performance (e.g., verification that groundwater is not polluted);
  - Sensitivity of the environment;
  - Degree of waste stabilisation as reflected by the cessation of landfill gas and leachate generation; and
  - Cap integrity.
- 20** All costs relating to the bond shall be paid by the Consent Holder, other than in relation to arbitration (see above), in which case both parties shall bear their own costs.
- 21** The decision to review the discharge of the bond should be based on the risk assessment criteria and methodology given in condition 10.
- 22** The Consent Holder shall ensure that there are always sufficient resources available to deal with public complaints.

To this end, the Consent Holder shall provide a 24 hours per day, seven days per week contact service, to facilitate the handling and resolution of any complaints. A complaints register shall be kept by the Consent Holder and the Consent Holder shall advise the relevant Council of any complaint received within five working days of the Consent Holder receiving the complaint, and of the remedial action taken. The Consent Holder shall make the complaints register available to the Councils upon request.

- 23** In the event that any human remains or archaeological deposits are discovered, the works in that area of the site shall cease immediately and the Police, Tangata Whenua, and/or Heritage New Zealand, shall be notified as soon as practicable. Works may recommence with the written approval of Heritage New Zealand after Heritage New Zealand has considered:
- Tangata Whenua interests and values;
  - the Consent Holder's interests;
  - any archaeological or scientific evidence;
  - any requirements of the Historic Places Trust; and
  - any requirements of the Police
- 24** In the event of any disturbance of Koiwi Tangata (human bones) or taonga (treasured artefacts), the Consent Holder shall follow the procedures detailed in an approved Accidental Discovery Protocol



**WQL1****Land Use Consent**

- Excavation of material (quarry rock) over an aquifer
- Deposition of material (C & D waste) over an aquifer within 5 metres of highest groundwater
- Deposition of hazardous waste (contaminated soil) onto land where the contaminant may enter water

- 1 This consent is subject to the general conditions listed in WQL0 General Conditions.
- 2 The landfill shall be constructed with a:
  - a. Landfill liner to isolate leachate from the underlying strata;
  - b. Leachate collections system to remove leachate from the landfill and minimise any hydraulic gradient across the liner, and;
  - c. An under-drainage system sized and specified to ensure effective sub-liner drainage, with a separate collection sump from the leachate collection system.
- 3 Leachate drainage and liner grades shall be configured such that the design maximum head of leachate on the liner is no greater than 300 millimetres over all areas of the liner apart from a sump area where the maximum head of leachate shall not exceed 5.0 metres.
- 4 The Consent Holder shall include within the Landfill Management Plan provisions setting out how the Leachate Collection and Disposal System will be maintained to comply with all conditions.
- 5 A final cover layer, at least equivalent to a 0.6 metre thick soil cap, shall be constructed as each stage of the Landfill reaches its final finished level.
- 6 The landfill design shall ensure achievement of calculated minimum factors of safety and maximum displacements as listed in the following table.

<b>DESIGN SCENARIO</b>	<b>MINIMUM DESIGN FACTOR OF SAFETY (FOS)</b>
Construction slopes – design conditions	1.3
Construction slopes – elevated groundwater	1.1
Final Design – design conditions	1.5
Final Design - elevated groundwater	1.3
Final Design - extreme groundwater	1.1
	<b>MAXIMUM DISPLACEMENT</b>
Final Design – Design Basis Earthquake (DBE)	Displacement of Liner <0.3m Displacement of capping layer <1.0m
Final Design – Maximum Credible Earthquake (MCE)	Displacement of liner <0.5m, Displacement of cap <2.0m

- 7 Waste shall only be discharged onto, or into, land on those areas of the site identified as the Landfill Footprint as shown on the application.
- 8 The Landfill shall accept the following wastes subject to visual inspection only:
  - a. Clean fill
  - b. Managed fill
  - c. C&D waste
  - d. Non putrescible industrial waste

- e. Untreated wood comprising less than one percent of any load by volume.
- f. Vegetative material comprising less than three percent of any load by volume.

It 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).

- 9 The Landfill shall accept the following wastes as Special Wastes subject to an approval process that requires the issuing of a Special Waste Permit for each waste type, and a Manifest for every load of waste related to that permit, and meeting the Waste Acceptance Limits for the range of compounds as detailed in Addendum A (attached)
  - 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 that has been removed, transported, and disposed of in accordance with the Asbestos Regulations
  - c. Treated hazardous waste
  - d. Medical wastes treated for disposal in accordance with NZS 4304:2002 "Health Care Waste Management".
  - e. Non-hazardous sludge wastes (e.g., wastewater treatment plant sludges) consistent with maintaining workable sludge/waste ratios for operations and stability purposes.
- 10 Special Wastes, (being Solid Waste, but which require special handling or testing or certification procedures), shall only be accepted if their disposal has been pre-booked, and are accompanied by a manifest detailing its nature, composition, and source in sufficient detail to demonstrate compliance with the waste acceptance criteria. All Special Wastes shall be specifically buried on a load by load basis, and immediately covered.
- 11 The following wastes are not acceptable for disposal at the landfill:
  - a. Household municipal waste
  - b. Putrescible waste
  - c. Prohibited wastes listed in Appendix I of the WasteMINZ Technical Guidelines for Disposal to Land: August 2018.
  - d. Any liquid wastes as defined by condition 12 of this consent, with the exception of landfill leachate and LFG condensate; and
  - e. Wastes or substances classified as explosive, flammable, oxidising or corrosive under the Hazardous Substances and New Organisms Act 1996.
- 12 No liquid waste, other than site generated liquid waste, shall be accepted for disposal. 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)
- 13 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 1 November each year, unless otherwise agreed in writing by the Canterbury Regional Council.
14. Sludges, fine grained materials other than the liner protection layer, special wastes, or wastes with the potential to affect the physical or chemical integrity of the liner, shall not be placed within three metres of the liner.

15. 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.
  - c. The delivery of material onto the site shall be supervised by the consent holder or their representative at all times.
  - d. Each person 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 Conditions 8 and 9 of this consent. These records shall be held at the landfill site and shall be provided to the Canterbury Regional Council on request.
16. The site shall be surrounded by fencing and lockable gates. All entrances to the site shall be securely locked when the site is not supervised.
17. 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 Conditions 8 and 9. This notification shall include the vehicle registration number and source of the waste (if known).
18. The Consent Holder shall arrange for a suitably qualified person to undertake a pest survey at least once a year. The first pest survey shall be completed prior to the Landfill operations commencing. The pest survey shall as a minimum include:
- a. The deployment of rodent tunnels at suitable locations
  - b. The deployment of possum wax baits
- The results of the pest surveys shall be included in the Landfill Annual Report.
19. The Consent Holder shall undertake pest control measures as required to control pests to a level that are no greater than those prior to the Landfill operation commencing.

# Addendum A Waste Acceptance Criteria

This Waste Acceptance Criteria is an extract from Appendix D of the 2018 WasteMINZ Landfill Guidelines, 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.

**Table D-1 Waste Acceptance Criteria for Inorganic and Organic Elements<sup>3</sup>**

Contaminant of concern	Unit	Maximum allowable TCLP concentration
Arsenic	mg/L	5
Barium	mg/L	100
Benzene	mg/L	0.5
Cadmium	mg/L	1
Carbon Tetrachloride	mg/L	0.5
Chlordane	mg/L	0.03
Chlorobenzene	mg/L	100
Chloroform	mg/L	6
Chromium	mg/L	5
Endrin	mg/L	0.02
m-Cresol	mg/L	200
o-Cresol	mg/L	200
p-Cresol	mg/L	200
Total cresol	mg/L	200
1,4-Dichlorobenzene	mg/L	7.5
1,2-Dichloroethane	mg/L	0.5
1,1-Dichloroethylene	mg/L	0.7
2,4-Dinitrotoluene	mg/L	0.13
2,4-Dichlorophenoxyacetic acid	mg/L	10
Heptachlor	mg/L	0.008
Hexachloro – 1,3-butadiene	mg/L	0.5
Hexachlorobenzene	mg/L	0.13
Hexachloroethane	mg/L	3
Lead	mg/L	5
Lindane	mg/L	0.4

<sup>3</sup> US EPA Chapter 40 CFR

Contaminant of concern	Unit	Maximum allowable TCLP concentration
Mercury	mg/L	0.2
Methoxychlor	mg/L	10
Methyl ethyl ketone	mg/L	200
Nitrobenzene	mg/L	2
Pentachlorophenol	mg/L	100
Pyridine	mg/L	5
Selenium	mg/L	1
Silver	mg/L	5
Tetrachloroethylene	mg/L	0.7
Toxaphene	mg/L	0.5
Trichloroethylene	mg/L	0.7
2,4,5-Trichlorophenol	mg/L	400
2,4,5-Trichlorophenoxypropionic acid	mg/L	1
2,4,6-Trichlorophenol	mg/L	2
Vinyl chloride	mg/L	0.2
Sulfides	ppm	50
Cyanides	ppm	50
Total halogenated compounds	ppm	1,000
Total synthetic non-halogenated compounds	ppm	10,000
Polychlorinated biphenyls	ppm	50

**Table D-2 Waste Acceptance Criteria for Inorganic and Organic Elements<sup>4</sup>**

Contaminant of concern	Unit	Maximum allowable TCLP concentration
Aluminium	ppm	40
Aniline	ppm	0.2
Antimony	ppm	0.6
Beryllium	ppm	10
Boron	ppm	20
Bromodichloromethane	ppm	1
Bromoform	ppm	10
Carbon disulphide	ppm	3
2 Chlorophenol	ppm	0.05
Copper	ppm	5.0
1,2 Dibromo-3-chloropropane	ppm	0.2
Dibromochloromethane	ppm	10

<sup>4</sup> Module 2: Hazardous Waste Guidelines MfE 2004

Contaminant of concern	Unit	Maximum allowable TCLP concentration
1,2 Dichlorobenzene	ppm	0.2
1,2 Dichloroethene	ppm	10
Dichloromethane	ppm	2
2,4 Dichlorophenol	ppm	0.05
1,2 Dichloropropane	ppm	1
1,3 Dichloropropene	ppm	2
Diethylphthalate	ppm	100
Dimethylphthalate	ppm	400
Ethyl benzene	ppm	50
Fluoride	ppm	200
Lithium	ppm	20
Molybdenum	ppm	10
Naphthalene	ppm	10
Nickel	ppm	10
Phenol	ppm	40
1,1,2,2 Tetrachloroethane	ppm	50
Tin	ppm	1000
Toluene	ppm	100
Tributyltin oxide (TBTO)	ppm	3
1,1,1 Trichloroethane	ppm	200
1,1,2 Trichloroethane	ppm	500
Vanadium	ppm	2.0
Xylene (m,o,p)	ppm	100
Zinc	ppm	10.0

## **WQL2 Water Permit**

- Drain water using subsoil drainage pipes

- 1 This consent is subject to the general conditions listed in WLQ0 – General Conditions.
- 2 Groundwater shall only be taken from a groundwater under-drainage system installed beneath the Landfill footprint, or in related slope cuts or relief drains needed to enable Landfill construction.
- 3 Any groundwater under-drainage flows shall be discharged to the surface water drainage system and routed through the sediment control ponds.
- 4 The Consent Holder shall measure the volume of groundwater taken from the groundwater under-drainage system. This shall be recorded. The volume of groundwater per month shall be reported in writing to the Canterbury Regional Council in the Landfill Annual Report.
- 5 The Consent Holder shall continuously monitor (15-minute readings) water from the landfill groundwater under drainage system before it enters the sedimentation pond, and water flowing out of the sedimentation pond outlet, for the following parameters:
  - a. pH
  - b. conductivity
- 6 Trigger levels to indicate potential leachate contamination of the underdrainage system shall be set by an appropriately qualified person using the following:
  - a. pH = the mean plus or minus three standard deviations of pH data from at least three months of continuous monitoring
  - b. Conductivity = the mean plus three standard deviations of conductivity data from at least three months of continuous monitoring
- 7 The Consent Holder shall submit a report to the Canterbury Regional Council with the trigger levels set in accordance with condition 6 for approval within six months of commencement of the landfill operations
- 8 The monitoring system shall be fitted with an alarm to indicate when the trigger levels for pH and conductivity have been exceeded at the outlet of the leachate system.
- 9 If the trigger levels agreed as of condition 6 are exceeded, the Consent Holder shall investigate the likely cause of the exceedance. The outcome of the investigation shall be included in the Landfill Annual Report.
- 10 If landfill leachate is considered a likely cause of the exceedance, the Consent Holder shall immediately take a grab sample of water and analyse this sample for the parameters listed below:
  - a. pH
  - b. conductivity
  - c. ammoniacal nitrogen
  - d. nitrate nitrogen
  - e. alkalinity
  - f. chloride
  - g. potassium
  - h. total organic carbon

- 11 Sampling shall be undertaken in accordance with protocols approved in writing by the Canterbury Regional Council.
- 12 If the results of the grab sample analysis confirms the presence of leachate contamination, then the Consent Holder shall immediately report to the Canterbury Regional Council on action taken and further actions to address leachate contamination.
- 13 The results of the grab sample analysis shall be reported to the Canterbury Regional Council within two weeks of sampling, unless otherwise agreed in writing by Canterbury Regional Council.
- 14 If monitoring of the discharge system indicates leachate contamination, then the Consent Holder shall take immediate steps to prevent further leachate contamination. The Consent Holder shall immediately report to Canterbury Regional Council on actions taken and further actions proposed to address leachate contamination.
- 15 The sedimentation pond shall be configured such that in the case of contamination being detected at the outlet, the outflow can be stopped for situations which do not result in flow over the spillway and shall include provision for pumping to enable contaminated stormwater to be recirculated to the Landfill or diverted to the leachate system for treatment as leachate.



### **WQL3 Discharge Permit**

- Discharge of clean stormwater and drainage water to land from a contaminated site
- Discharge of landfill leachate back into landfill

- 1 This consent is subject to the general conditions listed in WQL0 General Conditions.
- 2 All investigations, design, supervision of construction, operation, monitoring, and aftercare shall be undertaken by a Chartered Engineer experienced in such works or works of a similar nature.
- 3 The sedimentation ponds shall be designed to manage a 10 percent AEP design flood, with provision to pass a 1 percent AEP design flood. The sedimentation ponds shall be designed in accordance with the Canterbury Regional Council publication "Erosion and Sediment Control Guideline 2007".
- 4 All permanent diversion channels shall be designed to manage a 1 percent AEP (Annual Exceedance Probability) design flood.
- 5 Bench drains and other temporary drains shall be designed for the 20 percent AEP event. Diversion channels shall be designed such that if this capacity is exceeded the preferential (secondary) flow path is, as far as practicable, away from the Landfill.
- 6 All diverted stormwater shall be treated in the sedimentation ponds as shown on the Application.
- 7 Diversion channels and cut-off drains shall be maintained to minimise the infiltration and run-off of stormwater onto the Landfill from areas outside the Landfill footprint.
- 8 Scour protection works of concrete, rock or timber construction shall be placed at the outlet of the sedimentation ponds to prevent scour.
- 9 The Consent Holder shall be responsible for the structural integrity and maintenance of all dam works, and for any erosion control and energy dissipation works that become necessary as a result of the exercise of this consent. All channels shall be engineered to preclude excessive channel erosion at peak velocities.
- 10 General earthworks and sediment control measures shall be constructed and carried out in accordance with the principles contained within the Canterbury Regional Council publication "Erosion and Sediment Control Guideline 2007". The Consent Holder shall prepare an Erosion and Sediment Control Plan (ESCP) and submit it to the Canterbury Regional Council for approval prior to earthworks commencing.
- 11 The Consent Holder shall construct and maintain appropriate stormwater management measures, including drains and sediment traps for the interception and treatment of stormwater run-off from the works. These measures shall remain in place over the duration of the construction period and for a period following construction to allow suitable cover of vegetation to establish on restored areas.
- 12 The Consent Holder shall monitor water quality in the Woodstock Stream at the Location SW01 shown on Drawing E2. The Consent Holder shall monitor for the following parameters twice a year, to coincide with low flow during the winter groundwater level maximum (generally September) and summer groundwater minimum (generally April):
  - a. estimate of flow

- b. pH (field and laboratory)
- c. conductivity (field and laboratory)
- d. BOD5
- e. Chloride
- f. Potassium
- g. ammoniacal nitrogen
- h. nitrate nitrogen
- i. dissolved reactive phosphorous
- j. potassium
- k. total zinc
- l. total boron
- m. suspended solids.

- 13 Sampling shall be undertaken in accordance with protocols approved in writing by Canterbury Regional Council. The results of such monitoring shall be interpreted by a suitably qualified expert and reported in writing to the Canterbury Regional Council as part of the Annual Report.
- 14 All water quality sample analyses required shall be undertaken using standard methods as detailed in the "Standard Methods for the Examination of Water and Waste Water 1998", 20<sup>th</sup> edition by APHA and AWWA and WEF or by some other method approved in advance in writing by Environment Canterbury. A laboratory that is accredited to ISO/IEC Guide 25 for those specific tests shall carry out all testing.
- 11 No stormwater coming into contact with refuse shall be discharged as stormwater, but instead shall be considered as leachate and discharged into the leachate collection system.
- 12 The Consent Holder shall monitor the volume of leachate withdrawn from the landfill and record this volume on a daily basis. This record shall be reported in writing to the Canterbury Regional Council by 1 November each year, unless otherwise specified in writing by the Canterbury Regional Council.
- 13 Water used for container or landfill face access vehicle washdown, shall be treated as leachate, with appropriate storage and treatment.

#### **WQL4 Discharge to Air Permit**

- Discharge landfill gas, leachate, dust, and odour to air from an industrial activity (quarry and landfill)

- 1 This consent is subject to the general conditions listed in WQL0 General Conditions.
- 2 There shall be no objectionable odour or nuisance deposits of particulate matter beyond the boundary of the land owned by the Consent Holder, or land over which the Consent Holder has rights, as a result of any of the consent holder's activities on the site.
- 3 Refuse shall be covered with:
  - clean fill; or
  - soil cover to a minimum depth of 150 millimetres; or
  - any one or a combination of shredded wood, sprayed mulch, tarpaulins, and purpose built mechanical covers that perform to an equivalent or higher standard to a 150 millimetres soil cover, at the end of each working day.

Alternative daily cover materials may be used in lieu of the cover(s) specified, with the approval in writing from the Canterbury Regional Council. No refuse shall remain exposed overnight.
- 4 To minimise odour emission during handling of odorous special wastes the following measures shall be taken:
  - a. Vigilant attention and control of odorous loads entering the landfill, including the rejection of unexpected highly odorous loads.
  - b. Highly odorous loads shall only be accepted if their disposal has been pre-booked, to ensure the following measures are prepared:
    - Availability of odour masking chemicals.
    - An appropriately sized pit is available.
    - Suitable meteorological conditions; and
    - Suitable equipment being available.
  - c. Potentially odorous loads shall be required to be delivered during the normal working day and covered as soon as practicable and in any event not later than one hour following placement.
- 5 The Consent Holder shall measure and record on site weather conditions every 30 minutes. The parameters measured shall include:
  - a. wind velocity and direction
  - b. barometric pressure
  - c. rainfall, and
  - d. temperature.
- 6 The Consent Holder shall notify the Canterbury Regional Council and Waimakariri District Council of any complaints received by the Consent Holder regarding odour or dust as soon as practicable, and no longer than one working day after the complaint is received.
- 7 When complaints regarding objectionable or offensive odour or dust are received by the Consent Holder, the Consent Holder shall record the following details in a complaint log:
  - a. type and time of complaint.
  - b. name and address of complainant (if available).
  - c. location from which the complaint arose.
  - d. wind direction at the time of complaint.

- e. the likely cause of the complaint.
- f. the response made by the Consent Holder; and
- g. action taken or proposed because of the complaint.

The complaint log shall be available to the Canterbury Regional Council at all times, on request.

- 8 A walkover site inspection shall be undertaken no less frequently than weekly. Any evidence of actual or potential landfill gas leaks, such as odour, cracks in the Landfill surface, gas bubbles, leaks in the gas extraction system, or vegetation damage, shall be investigated. Where necessary remedial action shall be undertaken as soon as practicable to minimise fugitive gas discharges.
- 9 The concentration of methane at the surface of Landfill areas with intermediate or final cover shall not exceed 0.5 percent by volume. Quarterly monitoring of surface emissions shall be carried out to demonstrate compliance with this Condition.
- 10 The Consent Holder shall submit a Landfill Gas Report to Canterbury Regional Council at the end of each year as part of the Landfill Annual Report. The Landfill Gas Report shall include the following:
  - a. A summary of the monitoring results from the quarterly methane surface emissions monitoring
  - b. A summary of the weekly walkover inspections
  - c. A summary of any odour or dust complaints
  - d. The logs from the weather monitoring devices
  - e. An estimate of the amount of landfill gas being generated from the Landfill
  - f. A recommended programme of landfill gas management to ensure that surface emissions of intermediate or final cover does not exceed 0.5 percent by volume.
  - g. A summary of the performance of any landfill gas extraction and destruction system.
- 11 If the Landfill Gas Report recommends the installation of a landfill gas extraction system the Consent Holder shall engage a suitably qualified person to design the landfill gas extraction system and submit the design to the Canterbury Regional Council for approval.
- 12 All extraction wells that are to be connected to a gas extraction system shall be installed no longer than 12 months after placing wastes within the radius of influence of the wells. Gas venting from the wells prior to connection to the gas extraction system may be burnt by passive flares.
- 13 Landfill gas shall be monitored at each extraction well head or, if more appropriate, at manifold points, on a three monthly basis. The following parameters shall be measured and recorded:
  - a. gas flow rate
  - b. gas composition ( percent methane, percent oxygen, percent carbon dioxide)
  - c. gas temperature
  - d. ambient temperature
  - e. gas pressure
  - f. barometric pressure
  - g. ppm carbon monoxide if residual nitrogen exceeds 15 percent.
- 14 The residual Nitrogen content of landfill gas in all extraction wells shall not exceed 20 percent by volume or exceed five percent oxygen by volume.
- 15 There shall be no visible emission, other than water vapour, light, heat haze, or steam, from any Landfill gas flare.

- 16 The Consent Holder shall provide sufficient on-site electrical generation, or other appropriate measures, to ensure the operation of landfill gas flare equipment is not interrupted for more than two hours through loss of mains power supply. The gas collection and treatment system shall be restored as soon as practicable in the event of a malfunction or fault.
- 17 Until such time as a permanent landfill gas flare (or other utilisation station) is installed, landfill gas (blended) shall be monitored at each flare station on a three monthly basis. The following parameters shall be measured and recorded:
- gas flow rate
  - composition (percent methane, percent oxygen, percent carbon dioxide)
  - gas temperature
  - ambient temperature
  - gas pressure
  - barometric pressure
  - hydrogen sulphide
  - total non-methane organic compounds.
- 18 Except as provided in Condition 12, all extracted landfill gas shall be combusted in a flare (or other utilisation station) in accordance with the following:
- Enclosed flares shall have the following minimum specifications:
    - flame arrester and backflow prevention devices, or similar equivalent system
    - continuous automatic ignition system
    - automatic isolation systems to ensure that there is no discharge of unburnt landfill gas from the flare in the event of flame loss
    - adequate sampling ports to enable emissions testing to be undertaken, and
    - provision of safe access to sampling ports while emissions tests are undertaken
    - minimum temperature at 750 °C and retention time of 0.5 seconds
    - a permanent temperature indicator at half a diameter from the top of the flare with a visual readout at ground level.
  - Open flares shall comply with Condition (18)(a)(i) and (ii) above.
  - Landfill gas fired generators shall comply with specifications (18)(a)(i) to (a)(v) above.
- 19 Once a permanent landfill gas flare (or other utilisation station) is installed, landfill gas (blended) shall be monitored on a continuous basis and recorded electronically.
- gas flow rate
  - composition (percent methane, percent oxygen, percent carbon dioxide)
  - gas temperature
  - gas pressure
- 20 Once a permanent landfill gas flare or utilisation station is installed, landfill gas (blended) shall be monitored on a six-monthly basis. The following parameters shall be measured and recorded:
- hydrogen sulphide
  - total non-methane organic compounds.

- 21** The Consent Holder shall maintain a log of all inspections, investigations and actions taken with respect to the landfill gas system.
- 22** The Consent Holder shall include within the Landfill Management Plan provisions setting out how the Landfill Gas Collection and Treatment system will be maintained to comply with all conditions.
- 26** If monitoring demonstrates that the methane gas concentration limit specified in Condition 9 is exceeded, then remedial action shall be carried out and the concentrations re-tested within 14 days. If this is not practicable, the Consent Holder shall prepare a programme of remedial action, including a timetable, within 14 days of the exceedance. The proposed programme shall be implemented within the proposed time period.