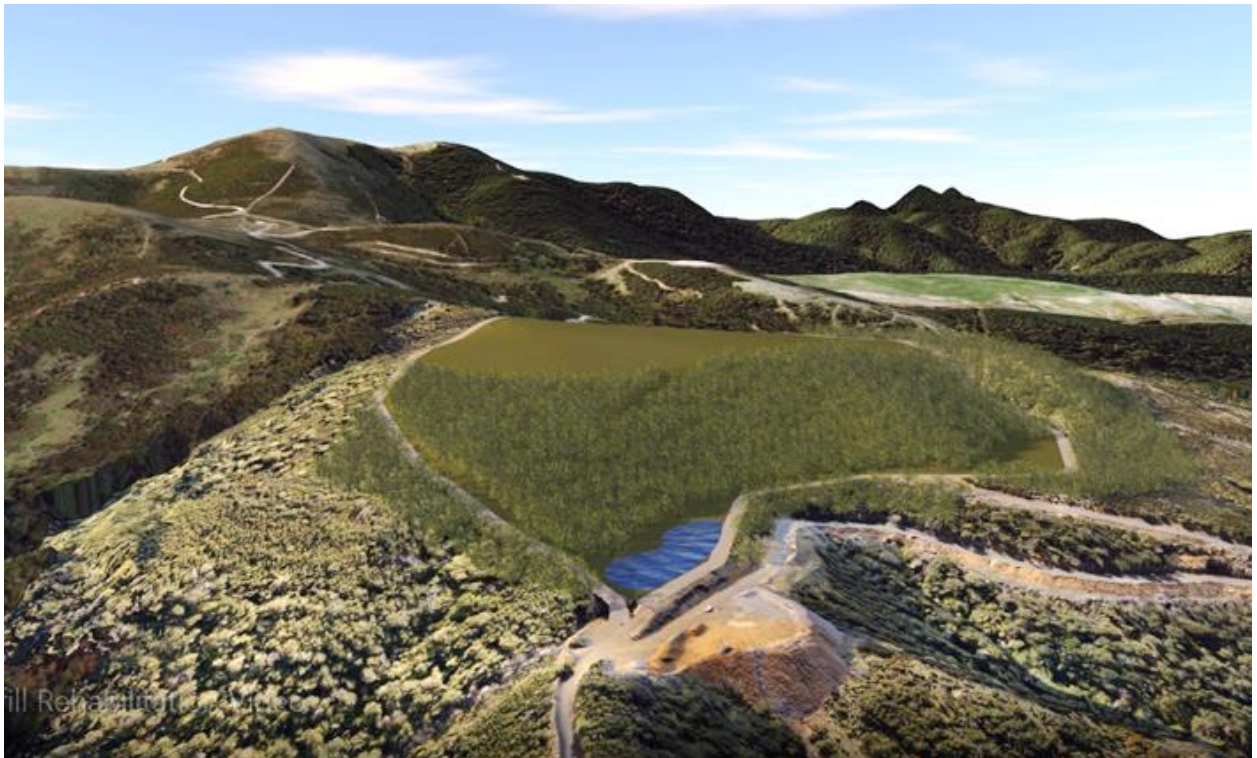


## **Woodstock Landfill**

# **Proposed Conditions of Consent Issue 3**



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

DOCUMENT OWNER	
Document Owner:	Woodstock Quarries Ltd
Document Name:	Woodstock Quarry Proposed Conditions of Consent Issue 2

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
2	21 February 2021	Martin Pinkham	Garry Blay	Darryn Shepherd
3	10 June 2022	Martin Pinkham	Darryn Shepherd	Darryn Shepherd

SUMMARY OF CHANGES SINCE PREVIOUS ISSUE (New or replaced conditions shown in Blue)	
Section / Conditions	Amendment(s)
<b>General Conditions</b>	
5	Addition of conditions relating to the QA required as part of liner construction
10 to 20	Conditions relating to bond replaced with conditions based on current best practice
25 e	Changed Hurunui to Waimakariri
<b>CRC214073 / CRC214077 Land Use Consent</b>	
6	Amended structural design criteria
8a	Added wording regarding visual inspection of demolition waste
8b	Amended percentage of organic material from by volume to weight
6	Changes to terminology and FOS relating to design
9b	Wording added regarding the handling of asbestos in accordance with guidelines
9e	Wording added regarding limits on PFAS
11d	WWTP and other industrial sludges added as not acceptable
20	Leachate not to be treated on site without a specific resource consent
21	Requirement for contaminated soils investigation and certification to be undertaken by an SQEP
<b>CRC214075 Discharge Permit</b>	
19	Changes to wording regarding investigation following a breach of a trigger level at SW01

## 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.

**Table 1 Schedule of Consents**

Reference	Type	Name
	General	<ul style="list-style-type: none"><li>General Conditions that apply to all consents</li></ul>
CRC214073 and CRC214077	Land Use consent	<ul style="list-style-type: none"><li>To use land to excavate material and to deposit material over an aquifer</li><li>To discharge contaminants from any industrial or trade premises onto or into land</li></ul>
CRC214074	Water permit	<ul style="list-style-type: none"><li>To take and use water for landfill drainage purpose</li></ul>
CRC214075	Discharge permit	<ul style="list-style-type: none"><li>To discharge drainage water and stormwater onto land and into land</li></ul>
CRC214076	Discharge to air permit	<ul style="list-style-type: none"><li>To discharge contaminants to air</li></ul>

## 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. 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 each stage of the landfill construction to certify that the works were carried out in accordance with the design plans submitted.
- 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, 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 The lining system will be installed with a high standard of QA, undertaken by a party independent from the lining installer, contractor, or landfill operator. The purpose of the QA process is to provide reliability that the lining system has been installed with no manufacturing or construction defects that may result in subsequent leakage.

The construction specification will specify the standards to be achieved and the quality control testing required by the contractor to demonstrate compliance with the specification. The QA process comprises an oversight of the testing undertaken by the contractor, regular or continuous observation of lining system placement and testing, and a review of all quality control documentation produced by the supplier and contractor.

Items that are observed and reviewed as part of the QA process include:

  - All specified manufacturing QA documentation and/or independent testing of the geosynthetic materials supplied by the manufacturer;
  - All compaction testing associated with installing the clay liner (strength, density, moisture content, air voids);
  - Permeability testing of the placed clay layer by an independent accredited laboratory;
  - Thickness of the compacted clay layer;
  - Approval of the clay surface for placing any geosynthetic lining components;
  - Approval of the geosynthetic liner placement methodology and panel layout;
  - Observation of placing, welding, and testing of geosynthetic lining components to include:

- Shear and peel testing of test weld samples at the commencement of each day;
- Shear and peel testing of destructive test samples;
- Air pressure testing of all dual track fusion welds;
- Vacuum box or spark testing of all extrusion welds;
- Visual inspection of the completed surface;
- Review of all construction records;
- Observation of placement of aggregate above the geosynthetic liner.

On completion of the construction of the liner system, a report is prepared to include all the test results, a description of the observations undertaken and certification that the lining system had been installed in accordance with the specifications. This report would be submitted to the Peer Review Panel (PRP) who would make recommendations to Environment Canterbury, prior to any waste being placed in that cell.

- 6 At least one months prior to earthworks commencing a Lizard Management Plan shall be forwarded to the Canterbury Regional Council. The Lizard Management Plan shall be prepared by a suitably qualified person and shall provide details of the procedures to be put minimise the potential for adverse effects on the lizard population due to the operation of the Quarry and Landfill.
- 7 At least three months prior to landfilling activity commencing a Landfill Management Plan (LMP) shall be forwarded to the Canterbury Regional Council. 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 refuse the Consent Holder shall provide and maintain in favour of Council, a financial assurance (bond) which, in the event of default by the Consent Holder, would:
  - (a) 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 or rule

in the Auckland Unitary Plan to be avoided, remedied or mitigated. This will include a provision for plausible risks or events that could potentially arise and require remedial works to prevent adverse environmental effects (Compliance) including a provision for any on-site and off-site ecological enhancement or restoration to the extent that it is required in the response to the works that have occurred as part of giving effect to the consent;

- (b) Secure the completion of closure and rehabilitation in accordance with the approved Aftercare section of the Landfill Management Plan, including reasonable provision for early closure events and associated costs in the event of abandonment of the site (Closure):
- (c) Ensure the performance of any monitoring obligations of the Consent Holder under this consent post closure, as well as any site aftercare obligations such as care of the landfill cap and pollution prevention infrastructure (Aftercare).

11. The amount (quantum) of the bond shall be adjusted over time as determined by any review conducted in accordance with Condition 14, provided that at any given time the amount shall be sufficient to cover the estimated cost at that time (including any contingency) of the bond components outlined in Condition 6.

12. The quantum for the components in Condition 4 shall be determined as follows:

(a) Part 1 – Compliance

The Part 1 component of the bond shall be derived based on reasonably foreseeable contingency scenarios defined in the Risk Management Assessment Report (Technical Report S of the application). This component of the bond shall be required for as long as a discharge consent is required for the landfill activity.

The amount shall include provision for the cost of short-term monitoring, site management and regulator inputs required by the resource consents.

(b) Part 2 – Closure

The Part 2 component of the bond shall be calculated by determining the likely maximum cost (including a 10% contingency) to close and secure the site at any point within a 5 year period following the review date. The Part 2 bond quantum will be derived in current day dollars. Where a risk based approach is adopted to assess potential remedial or other costs associated with the bond quantum, then costs shall be assessed to the 90% confidence limit using appropriate engineering methodology.

The amount shall include reasonable provision for all works necessary to close the site, including but not limited to the following:

- (i) Allowance for repair of damage associated with plausible early closure scenarios including, if applicable, repair of damage due to earthquake or extreme weather events.
- (ii) Allowance for remediation of any adverse effect on the environment that may arise from the site relating to plausible early closure scenarios.
- (iii) Allowance for the full extent of the works needed to complete final capping, revegetation, leachate and gas collection infrastructure and removal of any redundant site infrastructure.
- (iv) Allowance for any other rehabilitation work required by the sections on closure and aftercare in the Landfill Management Plan.
- (v) Allowance for the cost of short-term monitoring, site management and regulator inputs required by

the resource consents during closure works.

(c) Part 3 – Aftercare

The Part 3 component of the bond shall be calculated as the Net Present Value of all aftercare costs and shall be based on the cost elements as set out in the Ministry for the Environment Landfill Full Cost Accounting Guide March 2004. Aftercare costs shall be assessed as series of individual cost items, appropriately assessed over the duration of the aftercare period, with the amounts to be inclusive of contingency and a reasonable allowance for capital works or capital equipment replacement. This component will be developed using commercial financial parameters appropriate at the time of the initial assessment subject to amendment by scheduled review.

13. The amount of the bond required by Condition 4 shall be initially set on the basis of cost estimates, using the methodology in Condition 5, prepared by the Consent Holder and detailed in a bond report. The bond report shall be submitted to the Council for review and approval prior to the commencement of placement of refuse at the site. The amount of the bond shall cover costs associated with the three components defined in Condition 4.
14. An experienced practitioner shall conduct the assessment required by Condition 5 to prepare the bond report required by Condition 7. The method of conducting the bond assessment shall be documented in the bond report. The bond report shall include all assumptions made in completing the quantitative risk assessment.
15. The Consent Holder's bond shall be in a form agreed between the Consent Holder and Council and shall, subject to these conditions, otherwise be on terms and conditions agreed between them. The Consent Holder's bond shall name the Council as the party able to draw on the bond. The bond shall be available to the Council regardless of whether the qualifying event for payment of the bond is the result of any deliberate or inadvertent act of the Consent Holder or its agents.
17. Should the Consent Holder and the Council be unable to reach mutual agreement on the form, terms and conditions, or amount of the bond, in either the establishment of the bond in accordance with Condition 4 or in subsequent review of the bond in accordance with Conditions 13 or 14 or in terminating the bond in accordance with Conditions 14 or 15, 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 Council of the amount of the bond established or proposed to be established by the Consent Holder. If the parties cannot agree upon an arbitrator within 7 days of receiving advice that the amount of the bond is in dispute, then an arbitrator shall be appointed by the President of Engineering New Zealand. 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. If the decision of the arbitrator is not made available by the 30th day after appointment of the arbitrator, then the amount of the bond shall be fixed by the Council, until such time as the arbitrator does make his/her decision. The Consent Holder shall establish or re- establish the bond in accordance with the arbitrator's decision within 60 days after the decision.
18. The quantum of all components of the Consent Holder's bond defined in Condition 4 shall be reviewed every five years from the first placement of refuse at the landfill, by means of review of the bond report required by Condition 7. If, on review, the quantum of the bond to be provided by the Consent Holder varies by more than 10% of the sum secured by the current bond, then within 60 days of the Consent Holder being given written notice by Council of the new amount to be secured by the bond, the Consent Holder shall execute and lodge with the Council a variation of the existing bond or a new bond for the amount fixed on review by the Council.
19. 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 shall be supported by a bond report carried out in accordance with conditions 4, 5, 6 and 7, giving consideration to the following:

- (a) Environmental performance, including verification that groundwater and surface water are not polluted as a result of the landfill activities;
  - (b) Extent to which the offsite planting programme has been completed;
  - (c) Degree of waste stabilisation, as reflected in the results of monitoring of settlement, landfill gas and leachate; and,
  - (d) Integrity of closure works, including the landfill cap and surface water controls.
20. The bond shall continue to be maintained in favour of the Council throughout the aftercare period specified in this consent and shall be adjusted at the periodic reviews required by Condition 13 to align with future conditions at the site following closure. Unless otherwise defined in these conditions, the aftercare period commencement date shall be no earlier than the date of completion of capping of the final landfill cell, or the date of closure following abandonment prior to the final landfill cell being completed. If the landfill has been monitored and a bond report approved by the Council affirms that there are no existing or predicted adverse environmental effects from the landfill operation, then the Council may at its discretion discharge any remaining component(s) of the bond. The bond period may at Council's discretion be extended beyond 30 years following site closure, if the bond report at that time indicates that the landfill continues to pose an ongoing unacceptable risk to the environment such that there is an ongoing requirement for aftercare.
21. 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.
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 Kōiwi Tangata (human bones) or taonga (treasured artefacts), the Consent Holder shall follow the procedures detailed in an approved Accidental Discovery Protocol.
25. The Consent Holder shall establish, at its own cost, an Independent Peer Review Panel, to review the design, construction, operation, and after-care of the Landfill and to assess whether or not the work is undertaken by appropriately qualified personnel in accordance with good practice. The Independent Peer Review Panel shall

comprise at least two persons who shall be:

- a. independent of the Consent Holder
- b. experience in landfill design, construction, and management
- c. experience in landfill geotechnical, groundwater and surface water aspects
- d. recognised by their peers as having such experience, knowledge, and skill
- e. approved in writing by Waimakariri District Council and Canterbury Regional Council.

- 26 The Independent Peer Review Panel shall prepare an annual report for the Consent Holder on the adequacy of the following matters:
- a. management and monitoring plans
  - b. site preparation, including hydrogeological and geotechnical issues
  - c. liner design and construction and use of on-site materials
  - d. water control, including stormwater and leachate management
  - e. compaction, including method and degree
  - f. waste acceptance
  - g. cover material used
  - h. monitoring, modelling and records
  - i. rehabilitation.
- 27 Where the Independent Peer Review Panel does not have expertise in any of the areas it is required to report on, as detailed above, it may, with the agreement of the Consent Holder and Canterbury Regional Council, engage the services of an appropriate expert to report on the relevant matter to the Independent Peer Review Panel. The report shall form part of the review provided by the Independent Peer Review Panel as required by this condition. Copies of all reports shall be sent to the Consent Holder, the Waimakariri District Council, and the Canterbury Regional Council by 31 December each year, unless otherwise agreed in writing with the Waimakariri District Council and Canterbury Regional Council.

- To use land to excavate material and to deposit material over an aquifer
- To discharge contaminants from any industrial or trade premises onto or into land

- 1 This consent is subject to the general conditions listed in 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 1.5 metres.
- 4 The Consent Holder shall include within the Landfill Management Plan (LMP) provisions setting out how the Leachate Collection and Disposal System will be maintained to comply with all conditions.
- 5 A final capping shall be constructed as each stage of the Landfill reaches its final finished level. The minimum standard for the capping is:
  - a. 150mm growth layer
  - b. 600mm compacted soil ( $k < 1 \times 10^{-7}$  m/s)
  - c. Intermediate cover

The Consent Holder may construct an alternative capping design that is at least the equivalent of the minimum standard above.

- 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>
<i>Construction slopes – design conditions</i>	<i>1.3</i>
<i>Construction slopes – elevated groundwater</i>	<i>1.1</i>
<i>Final Design – design conditions</i>	<i>1.5</i>
<i>Final Design - elevated groundwater</i>	<i>1.2</i>
<i>Final Design - extreme groundwater</i>	<i>1.1</i>
	<b>MAXIMUM DISPLACEMENT</b>
<i>Final Design – Design Basis (SLS) Earthquake (150 year)</i>	<i>Displacement of Liner &lt;0.3m Displacement of capping layer &lt;1.0m</i>
<i>Final Design – ULS Earthquake (2500 year)</i>	<i>Displacement of liner &lt;0.5m, Displacement of cap &lt;2.0m</i>

- 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:
- Demolition waste [that has been processed at an accredited demolition waste sorting facility or from a demolition site that has been subject to a detailed site investigation.](#)
  - Untreated wood and vegetative material comprising less than five percent of any load by [weight](#).

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)
- 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.
  - Asbestos that has been removed, transported, and disposed of in accordance with the Asbestos Regulations. [Asbestos containing waste shall be handled in accordance with WasteMINZ publication "Waste industry guidelines to manage the collection, receipt, transport and disposal of asbestos waste – 2019"](#)
  - Treated hazardous waste
  - Medical wastes treated for disposal in accordance with NZS 4304:2002 "Health Care Waste Management".
  - [Waste containing PFAS products as detailed in Section 14 of the current PFAS NEMP](#)
- 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:
- Household municipal waste
  - Putrescible waste, except for the wastes listed in Condition 8a.
  - Prohibited wastes listed in Appendix I of the WasteMINZ Technical Guidelines for Disposal to Land: August 2018.
  - [WWTP sludges and other industrial sludges](#)
  - Any liquid wastes as defined by condition 12 of this consent, with the exception of landfill leachate and LFG condensate; and
  - 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:
- 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 baitsThe 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.
20. The Consent Holder shall not undertake the treatment of leachate on site without obtaining a specific resource consent to do so.
21. The Consent Holder shall require that 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.

**CRC214074      Water Permit**

- To take and use water for landfill drainage purpose

- 1 This consent is subject to the general conditions listed in 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 six months of continuous monitoring
  - b. Conductivity = the mean plus three standard deviations of conductivity data from at least six 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 underdrainage 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.

## **CRC214075      Discharge Permit**

- To discharge drainage water and stormwater onto land and into land

- 1 This consent is subject to the general conditions listed in 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, the point of compliance, shown on Drawing E2.
- 13 The Consent Holder shall continuously monitor (15-minute readings) water flowing at the point of compliance for the following parameters:



1. pH
2. conductivity

- 14 There shall be no discharge at the point of compliance that results in any of the following effects:
  - the production of any conspicuous oil or grease film, scums or foams or floatable or suspended material;
  - any conspicuous change in colour or visual clarity;
  - the rendering of freshwater unsuitable for consumption by farm animals;
  - any significant adverse effect on aquatic life in Woodstock Stream downstream of the discharge point.
- 15 Trigger levels to monitor the water quality of the discharge at the point of compliance 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 six months of continuous monitoring within the water supply dam during a period where it is representative of baseline conditions.
  - b. Conductivity = the mean plus three standard deviations of conductivity data from at least six months of continuous monitoring within the water supply dam during a period where it is representative of baseline conditions.
- 16 The Consent Holder shall submit a report to the Canterbury Regional Council with the trigger levels set as of condition 4(b) for approval within two months of the analysis.
- 17 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.
- 18 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.
- 19 If the trigger levels agreed as of Condition 15 above are exceeded, the Consent Holder shall investigate the likely cause of the exceedance. [The investigation shall include an assessment of potential toxicity effects in accordance with the ANZG 2018 water management framework. Should such an assessment indicate that potential or actual effects are more than minor the consent holder shall manage these effects in accordance with the effects management heirachy.](#) The outcome of the investigation , including any recommendations to improve the water quality, shall be included in the annual report.

- 20 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.
- 21 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.
- 22 Water used for container or landfill face access vehicle washdown, shall be treated as leachate, with appropriate storage and treatment.

- To discharge contaminants to air

- 1 This consent is subject to the general conditions listed in 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:
- a. gas flow rate
  - b. composition (percent methane, percent oxygen, percent carbon dioxide)
  - c. gas temperature
  - d. ambient temperature
  - e. gas pressure
  - f. barometric pressure
  - g. hydrogen sulphide
  - h. 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:
- a. Enclosed flares shall have the following minimum specifications:
    - i. flame arrester and backflow prevention devices, or similar equivalent system
    - ii. continuous automatic ignition system
    - iii. automatic isolation systems to ensure that there is no discharge of unburnt landfill gas from the flare in the event of flame loss
    - iv. adequate sampling ports to enable emissions testing to be undertaken, and
    - v. provision of safe access to sampling ports while emissions tests are undertaken
    - vi. minimum temperature at 750 °C and retention time of 0.5 seconds
    - vii. a permanent temperature indicator at half a diameter from the top of the flare with a visual readout at ground level.
  - b. Open flares shall comply with Condition (18)(a)(i) and (ii) above.
  - c. 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.
- a. gas flow rate
  - b. composition (percent methane, percent oxygen, percent carbon dioxide)
  - c. gas temperature
  - d. 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:

- a. hydrogen sulphide
- b. 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.