Ministry for the Environment
Manatū Mō Te Taiao

Contaminated Sites Remediation Fund

Application Form (Part 1)

Application Overview:	
Council name	Environment Canterbury
Site Name	s 9(2)(a) andfill
Project name	s 9(2)(a) Landfill
CSRF Phase *(Delete non-applicable phases as required)*	Phase 4 – Remediation
Total cost of project	s 9(2)(b)(ii)
Amount requested from CSRF	s 9(2)(b)(ii)
Estimated Duration of project	1 year

Official information and privacy

Official Information Act 1982

Important: Information presented to the Minister for the Environment or the Ministry for the Environment is subject to disclosure under the Official Information Act 1982 (OIA). Certain information may be withheld in accordance with the grounds for withholding information under the OIA. Further information on the OIA is available at www.ombudsmen.parliament.nz.

Information held by the Minister or Ministry may have to be released under the OIA in response to a request from a member of the public (or any other body) for that information. If you wish to provide sensitive information to the Minister or Ministry which you do not want released, it is recommended you consult with the Ministry as to whether the information is necessary for the application, and whether there may be grounds in the OIA for withholding the information. For instance, if release of the information would disclose a trade secret, or be likely to unreasonably prejudice the commercial position of the person who supplied or who is the subject of the information, then there may be grounds to withhold the information. If an OIA request relating to your application is received, the Ministry will endeavour to contact you to discuss it, and what the implications of releasing your information are.

The grounds for withholding information must always be balanced against consideration of public interest that may justify release. Although the Ministry does not give any guarantees as to whether information can be withheld under the OIA, it may be helpful to discuss OIA issues with the Ministry in advance if information provided with an application is sensitive.

Privacy Act 1993

Important: The Ministry for the Environment Environment House, 23 Kate Sheppard Place, Wellington 6011 may collect, use, hold or disclose personal information for the purpose of assessing eligibility and suitability for Contaminated Sites Remediation Fund funding. Individuals have the right in accordance with the Privacy Act 1993 to request access to and correction of their personal information. While the provision of personal information is not mandatory, failure to provide requested information could lead to a delay in considering the application or a decline of the same.

Introduction

This application form is for project proposals to the Contaminated Sites Remediation Fund. We strongly recommend that you read the *Contaminated Sites Remediation Fund Guide for Applicants 2018* before completing this application form.

Important information

- To improve your chance of success, refer to the *Contaminated Sites Remediation Fund Guide for Applicants 2018* before completing this form.
- There are two parts to the application form – both must be completed:
  - Part 1 : Project proposal and governance (in Word) [this document]
  - Part 2 : Estimated Project budget *(in Excel)*

  You must fill out both parts as incomplete applications will not be assessed.
- You can move between boxes in this form by using the mouse, pressing the ↑ and ↓ keys on your keyboard, or using the Tab key. Use text only; do not enter images, tables or graphs into the form.
- Complete all questions and the checklist. If a question does not apply to your project, please use 'N/A' or 'none' instead of leaving the reply blank.
- Follow the word limits for those parts that have them. To check the number of words, highlight the text and use Word Count on the Review toolbar.
- We are unable to accept applications which are late or incomplete. An application will not be considered if:
  - the designated application form (Part 1 and Part 2) is not used or the template form has been altered in any way
  - the application form (Part 1) is not electronically signed
  - the 'Balance of Funds (C)' in application form (Part 2) is showing a negative figure
  - the required supporting documentation has not been attached
  - all of the required information is not submitted as one email
  - it is received after the closing date, or received after the closing time on the closing date.
- Note that Contaminated Site Remediation Fund grant payments can only be paid ***after*** funding is approved and a deed of funding has been signed by both contracting parties. Funds are not available for activities which occur before the deed is signed.

If you need help to complete the application form, refer to the *Contaminated Sites Remediation Fund Guide for Applicants 2018* in the first instance. For any further information, email CSRFapplication@mfe.govt.nz.

When your application is complete

The deadline for completed application forms to be received by the Ministry is the last working day of March (Round 1) or September (Round 2), depending on the funding round. We are unable to accept late applications. We are also unable to assess incomplete applications, so it is important you provide all the required information.

Email your completed application form and supporting documentation (as required) to CSRFapplication@mfe.govt.nz (with 'CSRF application' and your organisation name in the subject line). We will only accept **one email per application** – documents submitted as multiple emails will not be accepted. There is a checklist for your use on the last page of this application form.

Once you have emailed your application, you should receive a reply to acknowledge that your application has been received. If you have not received a reply within one working day please call us to let us know. Rarely emails can be blocked without notification to either party and we do not want to miss your application.

Eligibility criteria

Applications to the Contaminated Sites Remediation Fund must be able to answer 'yes' to each of the eligibility criteria below. The following self-assessment checklist is based on the fund criteria. If you cannot meet these criteria, you are not eligible to apply to the Contaminated Sites Remediation Fund.

Note that meeting the eligibility criteria does not guarantee that your project will be funded. If you have any queries about the eligibility criteria please, email CSRF@mfe.govt.nz.

Contaminated sites that are on Crown land, where Crown has accepted responsibility for the contamination, are not eligible for the CSRF.

Self-assessment checklist

	Does your project meet the following criteria?		Yes / No
1	The application (Part 1 and Part 2) is complete and all supporting information has been provided.		Yes
2	Did site contamination occur **before** the RMA (1991)? *(if **NO**, move to question 3)*		Yes
3	Did site contamination occur **after** the RMA (1991) was enacted, but no enforcement action could be undertaken by regional councils, unitary authorities, or territorial authorities to investigate and/or remediate the contamination **AND** the activities that caused the contamination have since stopped?		No
4	Has the appropriate site investigation(s) been undertaken for the project phase that is being applied for? *Note: reports must be completed in accordance with Contaminated Land Management Guidelines 1 and/or 5 and attached as supporting information to this application.*		Yes
5	The funding application is for one (or more) of the following phases of work:		
	Phase	*Required supporting evidence:*	*Select all that apply:*
	Phase 2 – Detailed Site Investigation	*Preliminary Site Investigation*	☐
	Phase 3 – Remedial Planning	*Above, plus Detailed Site Investigation*	☐
	Phase 4 – Site Remediation	*Above, plus Assessment of Remedial Options and Remedial Action Plan.*	☒
6	Funding is only requested for the years in which the site investigation, remedial planning, and/or site remediation will be undertaken.		Yes
7	The applicant is a regional council or unitary authority.		Yes

Assessment criteria

Projects are measured against assessment criteria. The assessment panel reviews, scores and assesses applications that meet the eligibility criteria by determining the extent to which and how well the project demonstrates it meets the assessment criteria.

Some projects may be recommended for funding without conditions. Some projects may be recommended for funding for less than the requested amount, and/or with specific conditions of funding attached.

Assessment criteria		
1	Partnerships	Is there a demonstrated partnership between the regional council and other interested parties?
2	Human Health and Environmental Risks	Does the site pose (or potentially pose) significant risk to human health or to the environment? *Note this should be demonstrated through the supporting documents.*
3	Project Management	Has the project manager and/or regional council: • Demonstrated their project management expertise using best practice project management methodologies and tools • Established appropriate project management structures • Demonstrated capability to undertake the project (including the practicality and feasibility of the proposed actions)?
4	Priority	Does the site hold a ranking on the CSRF Priority List?
5	Responsibility	Does funding reflect the responsibility for the contamination? Does the landowner/occupier's contribution towards the project costs reflect their degree of responsibility for contaminating the site (fully or partially)?
6	External Funding	Do contributions from other parties reflect on their ability and/or willingness to contribute to the project?

SECTION A: Applicant details

See pages 13 and 14 of the Guide for Applicants 2018 for information on how to complete this section.

1. Regional Council details

Regional Council legal name	Canterbury Regional Council
Trading name (if different)	Environment Canterbury
Physical address *Include post code.*	200 Tuam Street Christchurch Central Christchurch 8011
Postal address *Include post code.*	PO Box 345 Christchurch 8140
Telephone	03 365 3828
Website address	ecan.govt.nz

2. Contact details for this application

Primary contact name	Conor Parker	Secondary contact name	Graham Aveyard
Organisation	Environment Canterbury	Organisation	Environment Canterbury
Role or job title	Senior Scientist	Role or job title	Science Team Leader – Contaminated Environmental Science and Hazards
Phone	03 365 3828 *Landline* s 9(2)(a) *Mobile*	Phone	03 365 3828 *Landline* s 9(2)(a) *Mobile*
Email address	conor.parker@ecan.govt.nz	Email address	graham.aveyard@ecan.govt.nz
Physical address *If different to above*	N/A	Physical address *If different to above*	N/A

SECTION B: Site details

See pages 15 and 16 of the Guide for Applicants 2018 for information on how to complete this section.

The following two sections should be high-level overviews, approximately 100 words per item, with detailed information provided through the supporting information (such as a Preliminary Site Investigation) attached with this application.

3. Details of your site

Site Name *What is the site commonly referred to as?*	s 9(2)(a) Landfill
CSRF Priority List Ranking *See: CSRF Priority List; or N/A if not listed.*	1
Has an application to the CSRF for this site been lodged previously? *If yes, provide the year and funding round. If funding was granted, provide the Deed Number.*	Yes 2017 Round 1 Deed number 22136
If contamination occurred ***after*** the RMA (1991) was enacted, has enforcement action been taken by the council? If yes, please provided details on what action was taken and the outcome. If no, provide details on why no enforcement action was taken.	N/A
Have the HAIL activities that caused the contamination ceased? If so, when?	x Yes ☐ No *If yes, provide details:* Filling of the site with waste material ceased prior to construction of homes in the late 1930's.
Will all, or part, of the site be sold following site works *Note: Sale of the site will trigger the Betterment Return term in the deed of funding.*	☐ Yes x No *If yes, provide details:* As multiple properties are involved in a residential setting, it is likely that properties will be sold in the future depending on individual property owners; however, the application is made with the view that none of the applicants are remediating in order to facilitate a sale of land.
What is the proposed use of the site following remediation?	Residential

Supporting information: It is a requirement to provide as supporting information to this application the most relevant site investigations correlating to the CSRF project phase you are applying for. Any supporting site investigation or remedial plan must have been completed in accordance with Contaminated Land Management Guidelines 1 and/or 5. If you do not submit the relevant supporting information, your application will not be assessed for funding. Refer to page 22 of the *Guide for Applicants 2018* for further information.

4. Site and Landowner Details

s 9(2)(a)							
s 9(2)(a)		s 9(2)(a)					

				s 9(2)(a)			
As above	As above				Occupant		

SECTION C: Project details

See pages 15 and 16 of the Guide for Applications 2018.

5. Project overview

Project Name	s 9(2)(a) Landfill
CSRF Phase *(Delete non-applicable phases as required)*	Phase 4 – Remediation
How many years are you seeking funding for?	1
Total project cost	s 9(2)(b)(ii) *What is the cash cost (exclusive of GST) of your project, including Contaminated Sites Remediation Fund funding, external funding, and your organisation's contribution?* ***This does not include in-kind costs, please indicate these costs below.***
Contaminated Sites Remediation Fund contribution	s 9(2)(b)(ii) *How much funding (exclusive of GST) are you requesting from the Contaminated Sites Remediation Fund?* *Projects that are contributing at least 50% of project costs are looked upon more favourably by the CSRF Assessment Panel*
In-kind Contribution *In-kind contributions include project management and monitoring. Roughly 10% of total project costs are considered a standard in-kind contribution.*	s 9(2)(b)(ii) *If you required a higher percentage of in-kind contribution, please outline the reasoning, below:* N/A
Do you require any statutory or non-statutory permissions to complete the project? *For example, resource consents, planning consents, or landowner permissions?*	X Yes ☐ No *If yes, which permission(s) are required? Have you applied for these? If so, when is a decision expected (if known)?* A resource consent for soil disturbance and removal will be required from Christchurch City Council. This will not be applied for until a contract is awarded for the works. A single consent is anticipated for all works. A resource consent for stormwater discharge will be required from Environment Canterbury. This will not be applied for until a contract is awarded for the works. A single consent is anticipated for all works.

6. Project objectives

Provide between three and six concrete statements which describe the tangible results your project will achieve. Note that some project outcomes will be achieved over a longer timeframe, however the objectives described here must be achievable within the duration of the funding. Please ensure that:

- *objectives are SMART (Specific, Measurable, Achievable, and Realistic within the Timeframe of the project). Refer Appendix 2 (page 42) of the Guide for Applicants 2018 for more information on setting SMART objectives.*
- *all objectives are clearly defined and achievable within the duration of the funding*
- *each objective has at least one key performance indicator (KPI)*
- *successful completion of tasks and activities (question 9) will lead to achievement of the project objectives*
- *you have a clear plan for measuring, evaluating and reporting whether your project objectives have been met.*

Objective *Describe the tangible results your project is trying to achieve.*	**Key performance indicators (KPIs)** *KPIs are concise statements about key benefits of the project and how they will be achieved.*	**How will you monitor and evaluate the achievement of this objective?** *How will you measure your progress and demonstrate that the objective has been achieved?*	**Baseline information** *Describe the current situation, using the data you have available.*	**Expected outcome** *What is the expected benefit from this objective being met? How does this contribute to the purpose of your project?*
The remediation of the s 9(2)(a) Landfill is undertaken in a manner that minimises any risk from the contaminants present to site workers and owner/occupiers.	The health and safety of site users is maintained by all works being undertaken in accordance with the site health and safety plan.	A Site Health Safety and Environment Plan is submitted by the contractor prior to works. An accident register is available to site workers to record any incidents. Corrective action is taken when an issue is identified.	Property owners have site management plans for current use of their land.	The health and safety of workers and occupants is protected.
The remediation of the s 9(2)(a) Landfill results in individual properties being regarded as at least 'managed for residential land use'.	The affected properties are able to be used with limited restrictions for regular tasks after replacement/covering of contaminated fill material.	All properties included in this application are categorised on Environment Canterbury's Listed Land Use Register as "Managed for Residential Land Use" based on evaluation of completion reports in accordance with CLMG 1 and 5.	All properties are currently regarded as "contaminated for residential land use" and are categorised as such on the Listed Land Use Register.	The affected properties are able to be used with limited restrictions for regular tasks. The long-term health of residents is protected from fill material.

The remediation of the s 9(2)(a) Landfill results in individual properties being remediated in a way that is acceptable to current owners and realistically usable by future owners.	Trust from the community is maintained or improved in local and national organisations, and The affected properties are able to be used with limited restrictions for regular tasks, by Using excellent consultation with residents prior to site works and regular communication during site works.	A minimal number of complaints from residents and zero withdrawal of properties from the project by current owners.	An assessment of remediation options has been made and consultation with owners on what option is preferred for how they use their property.	Residents will be satisfied with the project and have confidence in the organisations involved to act in the residents' interest.
Develop and maintain relationships between Christchurch City Council, Environment Canterbury, and Canterbury District Health Board in order to coordinate responses for community wide issues.	Contacts between the organisations are improved and more efficient responses can be made for similar situations using regular meetings and communications documenting progress and key learnings during this project.	Regular meetings and updates will be recorded. An assessment of 'lessons learned' made at the end of the project.	Christchurch City Council, Environment Canterbury, and Canterbury District Health Board have been making a cooperative and coordinated effort since 2015 at s 9(2)(a) Landfill.	Christchurch City Council, Environment Canterbury, and Canterbury District Health Board will have more efficient responses to similar situations.

7. What environmental, social, cultural and economic benefits will occur as a result of this project?

Please outline the economic, environmental, social and/or cultural benefits that will result from the completion of your project. Project benefits may be achieved outside the life of the CSRF funding. Add more rows if required.

See pages 24-25 of the Guide for Applicants 2018 for information on how to complete this question.

Examples include:

- *Environmental - eg, reduction of harm to the environment, improved environmental values*
- *Social - eg, human health, enhanced public safety, improved aesthetics and amenities*
- *Cultural - eg, enhanced cultural awareness/kaitiakitanga,*
- *Economic - eg, future monetary benefits from the remediation of the site*
- *Sustainability - eg, sustainable remedial options to reduce waste to landfill*

Type of benefit	Description
Environmental	• A reduction in the volume of contaminated fill material at the location will have reduced effect on groundwater from the fill material. • Plants and wildlife across 16 properties will be separated from contaminated fill material.
Social	• The risks to human health will be considered to be managed because a physical barrier will prevent human exposure to contaminated soil at depth. • Site users will be able to use and visit the affected properties with few limitations.
Economic	• The value of properties will be increased to that prior to knowledge of contamination. • The financial burden of remediation will not be passed on to future site users.
Sustainability	The site will be remediated in a way that requires little ongoing maintenance.

8. Risk management

Provide a brief description of the major risks to the project achieving the intended outcomes. Include consideration of potential barriers that may pose a risk to the success of the project. Where possible give an indication of the likelihood and significance of the risk and any mitigation strategies to be included in the project.*

*See page 26 of the Guide for Applicants 2018 for information on how to complete this question. *Risks to human health and the environment should be outlined in the supporting documents*

Potential risk *Identify the potential risk to your project (for example, project not completed on time, unpredictable events such as weather, lack of resource commitment, time and cost estimates too optimistic, unexpected budget cuts, stakeholders changing requirements after the project has started, risks to the industry or sector to which the organisation belongs).*	**Level of risk** *Low, medium or high.*	**Impact on project** *Describe the impact the risk would have on the project (for example, misunderstandings, duplication of work, incomplete work).*	**Consequence on project** *Minor, moderate or severe.*	**Strategy to mitigate** *Describe the process you will use to minimise and manage the risk (for example, project manager monitors functional roles to ensure enough time is allocated to complete each task/activity and the project as a whole).*
Project not completed on time	High	Loss of confidence by the community in organisation's abilities and increased costs.	Moderate	Consultant project manager sets and monitors an expected timeline of stages of works. Excellent communication with landowners.
Project not completed on budget	Medium	Incomplete work	Severe	An assessment of cost had been made in the assessment of remedial options. The project is put to competitive tender with clear requirements and targets.
Property owners change requirements after the project has started	Low	Incomplete work	Moderate	Excellent communication and individual property works plans made with site owners prior to works.
Property sold during project	Low	Incomplete work	Minor	Transfer landowner names on the Deed of Funding. Maintain the Listed Land Use Register to ensure

				potential new owners of the current issues.
Media interest	Medium	Slowed work	Moderate	A communications plan currently exists with messaging to present to media. We will not initiate contact with media (e.g. media releases, website updates). Good relations to be maintained with land owners and the community.
Neighbourhood objections to works	High	Slowed work	Moderate	Contractor to ensure that affected properties and neighbours are informed of what is happening and timelines prior to work. Traffic management plans.
Site access is not coordinated	Medium	Slowed or duplication of work resulting in higher costs.	Moderate	Consultant Project Manager and contractors coordinate access and works across properties in a planned timeline.

SECTION C: Resources, capability and partnerships

See pages 27-29 of the Guide for Applicants 2018 for information on how to complete this section.

9. Project team including contractors

You must be able to demonstrate that the project will engage personnel with the required technical, project management, and financial management skills to successfully deliver the project. Provide details of your proposed project team and confirmation of their availability for the duration of the project. Note that it is mandatory to provide details of your project manager.

See page 27 of the Guide for Applicants 2018 for information on how to complete this question.

Name	Organisation	Role in project	Confirmed	Phone	Email
Conor Parker	Environment Canterbury	Project manager *Note that you **must** provide a copy of the project manager's CV or job description of project manager as part of your application.*	Yes	027 839 0101	conor.parker@ecan.govt.nz

If the application is successful, a consultant will be engaged to manage the project in accordance with Environment Canterbury's Procurement and Contract Management Strategy. A procurement plan will be produced and consultants engaged for tendering through TenderLink or GETS in an open competitive procurement method. The Ministry for the Environment will be informed of the successful applicant and their details provided.

10. Governance and management structure

See page 28 of the Guide for Applicants 2018 for information on how to complete this question.

Project governance *Describe the governance structure/s that will be implemented to ensure monitoring and management of performance and effective decision-making occurs. Include information on members of the governance group and their skills.*	Project Sponsor – Stefanie Rixecker (Director Science) Project Lead – Graham Aveyard (Team Leader Contaminated Land, Environmental Science and Hazards) Project Manager – Conor Parker (Senior Scientist) Consultant – TBA Regular (weekly or fortnightly) meetings will occur between the Project Manager and the Consultant. The Ministry for the Environment will be provided weekly updates of progress and issues.
Managing funds *Provide information about how you will manage the project funds if your application is successful. Include information about how you will procure goods and services, approve payments, and monitor and address budget overspend.*	Environment Canterbury have a robust competitive procurement process for projects/expenses valued over s 9(2)(b)(ii). An open tender will be made following the development of a procurement plan that provides specifications of the contract, timelines, and evaluation criteria to compare competing bids. The contract will be awarded for a fixed dollar amount. Any variation from this will require a written variation of contract with Environment Canterbury. Regular (weekly/fortnightly) meetings will take place with the contract manager to report on progress and to identify issues regarding costs and time.

11. Partnerships

See page 29 of the Guide for Applicants 2018 for information on how to complete this question.

Is the current landowner(s) (or guarantor) willing to contribute financially to the project *Note, due diligence may be required to be undertaken on the landowner if application is successful.*	☐ Yes X No *If no, is the landowner willing to support the project in other ways?* No other support is provided.
Which individual organisations will be involved in the project *List the name of the organisation and details of their involvement*	Environment Canterbury Christchurch City Council Community and Public Health CDHB
Who are the projects key stakeholders *List the name of the stakeholders and details of their interest in the project*	• The residents and landowners of properties listed in the 'Site and Landowner Details' are the key stakeholders due to the potential impact on health and the financial loss on property value. • Environment Canterbury are the organisation responsible for making the CSRF application and monitoring contaminated land in Canterbury.

	• Christchurch City Council are responsible for administering the NES for Assessing and Managing Contaminants in Soil to Protect Human Health and land use within Christchurch City.

12. Health and safety

It is important that you have the necessary health and safety policies, resources and expertise to safely undertake and complete the project. You must comply at all times with the requirements and provisions of the Health and Safety at Work Act 2015 (HSWA). You will be asked to submit a health and safety plan for your project if you are invited to proceed to Stage 2. See page 28 of the Guide for Applicants 2018 for information on how to complete this question.

Does your organisation have a health and safety policy?	x Yes ☐ No *If yes, state when this was last reviewed/updated.* 2014
Has your organisation or any other parties involved been issued with any notices under health and safety legislation?	☐ Yes x No *If yes, please provide details.*
Who will be responsible for health and safety for the project?	Health and Safety will be the responsibility of the consultant that performs the works required at s 9(2)(a) Landfill. A Health and Safety Plan will be provided by the consultant and approved by Environment Canterbury before the start of works. This document will be supplied to the CSRF.

SECTION D: Additional information

See pages 30-31 of the Guide to Applicants 2018 for information on how to complete this section.

13. Conflicts of interest

Describe any known conflicts of interest (actual or potential) and steps you will take to manage them. Before completing this section, see page 30 of the Guide for Applicants 2018.

Two of the properties are planned to be sold in the near future. We aim to have the betterment clause removed from the Deeds of Funding due to these properties being improved back to market rate rather than beyond what they were purchased for.

14. Is there anything else we need to consider about your application?

Provide any additional information you or your organisation considers important, but has not been covered in previous questions in this application form. (maximum 400 words)

- It is understood that all property owners had no reasonable way of learning that their property was on a landfill prior to purchase.
- Two other properties in the affected area (s 9(2)(a)) were purchased with information available of their contamination status. These properties will have separate applications for funding but are considered to be an integral part of the wider project in terms of time and cost due to the savings that could be made with a coordinated effort.
- 100% of funding is being requested from the CSRF. It is not possible to equitably distribute costs amongst landowners where remediation costs differ substantially from property to property and each landowner is in very different financial situations and stages in life. Environment Canterbury and Christchurch City Council have contributed significantly in staff time and money toward s 9(2)(a) and will continue to provide in-kind support.
- The Assessment of Remediation Options estimates differ where consultation with landowners has resulted in a mixture of options on different parts of the property (s 9(2)(a)) and where the planned remediation area has been reduced as contaminant concentrations are less than twice the land use standard and can be managed (s 9(2)(a))
- s 9(2)(a) have not been included in this application as remediation and management has respectively occurred.

Declaration

This declaration must be completed by a person with the organisation's signing authority. See page 31 of the Guide for Applicants 2018 for additional information on how to complete this question.

***Important:** Please contact the Ministry if you have any queries about the terms and conditions of the deed of funding for the Contaminated Sites Remediation Fund.*

As a duly authorised representative of the organisation as per Section A of this Contaminated Sites Remediation Fund application form:

- I declare that my project meets all of the eligibility criteria for the Contaminated Sites Remediation Fund (*see page 4 of this application form*).
- I declare that to the best of my knowledge, the information contained in all sections of this application form, or supplied by us in support of our application, is complete, true and correct.
- I declare that I have the authority to sign this application form and to provide this information.
- I declare that the application is not being made by an organisation that is in receivership or liquidation, or by an undischarged bankrupt.
- I declare that I have provided information about any actual or potential conflicts of interest (in question 13) and that I will promptly inform the Ministry for the Environment of any such conflicts if they arise subsequent to the submission of this application.
- I understand that information presented to the Minister for the Environment and Ministry for the Environment is subject to disclosure under the Official Information Act 1982, other legislation, court orders, and in response to Parliamentary questions.
- I understand my rights in accordance with the Privacy Act 1993.
- I agree that the Ministry for the Environment can undertake, for the purpose of assessing eligibility and suitability for Contaminated Sites Remediation Fund funding, a background check on the applicant(s), including but not limited to credit checks, criminal record checks, and reference checks from other parties, and may liaise with local and national organisations about this application.
- I understand that if I receive an invitation to proceed to Stage 2 of the funding process this is not a confirmation of funding, and that the final decision is subject to a successful completion of Stage 2.

Name	Graham Aveyard	
Position	Science Team Leader – Environmental Science and Hazards	
Signature *By typing your name in the space provided you are electronically signing this application form.*	Graham Aveyard	Date 27/09/2018

Checklist

Use the following checklist to confirm you have provided all the required information in your application.

Do not include any attachments that the Ministry has not specifically requested. These will not be provided to the assessment panel.

X All sections of this Application Form (Part 1) have been completed (using 'N/A' or 'none' if required).

X All sections of this Application Form (Part 2) have been completed (using a zero if required).

X All $ figures provided in Application Form (Part 1) and (Part 2) add up and are consistent throughout the application.

X Declaration on the Application Form (Part 1) has been electronically signed and dated.

☐ Letters confirming co-funding for your project from each organisation listed as 'external funding sources' in Application Form (Part 2).

X **Supporting Documents – you must include the appropriate site investigation/remedial plan/etc** in support of your application depending on what project phase you are applying for.

X Application form, project budget, and any supporting information will be submitted as **one email only**. (Documents submitted as multiple emails will **not** be accepted.)

X Application form, project budget, and any supporting information will be submitted no later than **5:00 pm** on the **last working day of March or September**.

cook | costello
Engineers | Architects | Surveyors

ACENZ

PRELIMINARY AND DETAILED SITE INVESTIGATION REPORT

s 9(2)(a) ,
Christchurch
s 9(2)(a)

For Insurerbuild

cook | costello
Consulting Engineers

18 September, 2015

Job Ref # 12202-103

Table of Contents

Table of Appendices

Summary contaminated sites report checklist					
Indicate the reports contained in this document	☐	☑	☐	☐	☐
Report section(s) and information to be presented	**PSI**	**SIR**	**RAP**	**SVR**	**MMP**
Executive summary	R ☐	R ☑	R ☐	R ☐	R ☐
Scope of work	R ☐	R ☑	R ☐	R ☐	R ☐
Site identification	R ☐	R ☑	R ☐	R ☐	R ☐
Site history	R ☐	S ☑	S ☐	S ☐	S ☐
Site condition and surrounding environment	R ☐	S ☑	S ☐	S ☐	S ☐
Geology and hydrology	A ☐	R ☑	S ☐	S ☐	S ☐
Sampling and analysis plan and sampling methodology	A ☐	R ☑	X	R ☐	R ☐
Field quality assurance and quality control (QA/QC)	N ☐	R ☑	X	R ☐	S ☐
Laboratory QA/QC	N ☐	R ☑	X	R ☐	X
QA/QC data evaluation	N ☐	R ☑	X	R ☐	X
Basis for guideline values	R ☐	R ☑	R ☐	R ☐	R ☐
Results	A ☐	R ☑	R ☐	R ☐	S ☐
Site characterisation	R ☐	R ☑	R ☐	R ☐	R ☐
Remedial actions	X	X	R ☐	S ☐	S ☐
Validation	X	X	X	R ☐	S ☐
Site management plan	X	X	R ☐	S ☐	S ☐
Ongoing site monitoring	X	X	X	N ☐	R ☐
Conclusions and recommendations	R ☐	R ☑	R ☐	R ☐	R ☐

1. EXECUTIVE SUMMARY

Cook Costello Ltd have prepared a Preliminary and Detailed Site Investigation Report for the land at s 9(2)(a) , Christchurch.

The preliminary site investigation identified that the neighbouring site (s 9(2)(a)) is located on a historic landfill. The landfill likely operated between 1900 and circa 1930 but is not noted on the earliest aerial image available for the area (1941). 'Landfill sites' is an activity noted on the Hazardous Activities and Industries list (HAIL). A Preliminary Geotechnical Investigation Report completed by Geoconsult (30/04/2014) recommends a full detailed contamination assessment be undertaken due to similarities between s 9(2)(a) .

The scope considered by this report includes assessing the likelihood of soil contamination from these activities and if present to assess risk to human health. Due to the very limited early site records and presence of onsite FILL material, further soil testing for NES metals and TPH has been conducted.

A targeted sampling strategy was undertaken and four soil samples were analysed for the below contaminants of concern:

- Heavy metals including arsenic
- Total petroleum hydrocarbons (TPH)

If contaminant levels are above background, any future soil movement exceeding 25m^3 per 500m^2 or removal exceeding 5m^3 per 500m^2 may require resource consent in accordance with the MfE National Environmental Standard for Contaminants on Soil (2011).

This report finds that Hazardous Activities have occurred at s 9(2)(a) , s 9(2)(a) . Based on the investigation, key human health and environmental receptors are likely to be at risk of exposure to unacceptable levels of arsenic, cadmium, lead, nickel and zinc.

2. SCOPE OF WORK

Cook Costello Ltd have been engaged by Insurerbuild to prepare a detailed contamination land assessment report to identify any significant hazardous activities and industries that may affect future development.

The site is not recorded on Environment Canterbury's Listed Land Use Register (LLUR); however, the neighbouring site s 9(2)(a) is noted as G3 – Landfill Sites.

The scope of this assessment is to ascertain the degree and extent of soil contamination and potential risk to human health. This assessment will be completed in accordance with the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES, 2011).

A Detailed Site Investigation was considered necessary as similarities were noted between s 9(2)(a) , FILL material was noted in onsite hand auger logs and it was recommended in the geotechnical report by Geoconsult.

This report considers the following aspects of site investigation:

- Preliminary Site Investigation (PSI)
- Detailed Site Investigations (DSI)

This report must be read in its entirety. The report has been compiled using a desktop review of information available for the property, a site walkover and interpretations of the data from the onsite investigations. This report is based solely on the ground underlying the site. The reliance by other parties on the information or our opinions contained in the report shall, without our prior review and agreement in writing, be at such parties' sole risk.

A site visit and soil sampling for the DSI was undertaken on the 31st of July 2015.

3. PRELIMINARY SITE INVESTIGATION

3.1. Site Identification

The site is located at s 9(2)(a), Christchurch. The property is accessed directly off s 9(2)(a) which forms the eastern property boundary. The legal description of the site is s 9(2)(a) and the total size of the lot is 607m². The Heathcote River is located approximately 170m west of the site. A site plan is attached in Appendix 1 and site photographs taken during the investigation are included in Appendix 2.

3.2. Site History

s 9(2)(a) is presently under the ownership of s 9(2)(a). A review of aerial imagery, Environmental Canterbury (ECAN) and Christchurch City Council (CCC) records have been undertaken to determine the site history.

Historic aerial and satellite images were sourced from 1941 to the present day (attached in Appendix 3). The photographs show the site was developed and contained a dwelling since 1941. Current aerial photographs are consistent with the present situation observed during the site walk over.

Numerous site records were obtained from ECAN and CCC including:

- Identification of the neighbouring site at s 9(2)(a) on the LLUR (Appendix 4). The site is listed as s 9(2)(a), Hail category G3 – landfill sites. Investigations have been undertaken on this site and found various fill material between 0.2 – 2.0mbgl in 4 hand augered boreholes. Soil samples tested found that arsenic, cadmium, lead and ΣBaP concentrations exceed the applicable Soil Contaminant Standards (SCS).
- The site at s 9(2)(a) is not noted on the LLUR and no investigations have been previously undertaken on this site (Appendix 4).
- No Resource Consent records are found for the site.
- The site is noted on SCIRT's Dewatering Contamination Risk Map but not included within the G3 Landfill Sites Map (Appendix 5).
- The properties file including Land Information Memorandum (LIM). This was noted but not inspected at CCC due to time frames for this report.

Since the suspected landfill activities were undertaken pre 1941 no interviews were undertaken with the current site owner.

There are numerous groundwater wells noted on the ECAN database but these are >250m from the site and therefore not relevant to this investigation. A nearby machine drilled borehole s 9(2)(a)) was noted on the Canterbury Geotechnical Database

(CGD) at s 9(2)(a) , 15m north of the site. This BH found the water table around 1.1mbgl. Onsite hand augered (HA) boreholes completed by Geoconsult experienced refusal on obstructions at 1.4mbgl and the groundwater table was not noted. The BH and HA data is included in Appendix 6. The GNS Science median water table elevations find the ground water table 2.0 – 4.0mbgl. It is likely the groundwater flows in a westerly direction towards the Heathcote River.

3.3. Site Condition and Surrounding Environment

The site is currently being used for residential purposes and has been developed since pre 1941.

The site classification according to MBIE is Technical Category 3; the adjacent properties are also classified as TC3. A TC2 zone indicating the location of less land damage and soil which is more resistant to liquefaction induced deformation is located 40m to the southwest of the site.

The site topography is generally flat and is elevated above the river. No interim floor level has been set by the Christchurch City Council (CCC) at the property as it is outside the current 50 Year Floor Level Control Area and Flood Management Area. During the site walkover no surface ponding was observed.

3.4. Geology and Hydrology

The subsoils beneath the site are expected to consist of sandy gravelly silt with some brick and organics (Fill) to 4.3mbgl as identified by the nearby BH (s 9(2)(a)) included in Appendix 6. The onsite Geoconsult hand auger logs refused on obstructions at 1.4mbgl, up to this depth the logs noted soil types of Silt, Sand and Fill. ECAN describes the soil group as 'recent'.

Groundwater flow direction inferred from the topography is assumed to be in a westerly direction towards the Heathcote River. The groundwater table is unconfined and expected to be around 1.5mbgl. The aquifer has been assessed as s 9(2)(a)

3.5. Conceptual Site Model

As identified throughout the preliminary site investigation, there is a potential that the neighbouring HAIL activities have left contamination in the soil, or the site itself had HAIL activities but was excluded from the LLUR. The hail activities may pose a risk to human health or the environment.

A conceptual model representing the site characteristics in written form and showing the possible relationships between source, pathway and receptors is included in Table 1 below.

Source	Pathway	Receptor
Heavy metals – potential topsoil contaminants from landfill sites	Leaching through soil, migration in ground water, skin contact, inhalation of contaminant soil dust or contaminated air, ingestion	Site workers, visitors and occupiers, particularly during earthworks, groundwater
Total petroleum hydrocarbons – potential contaminants from landfill sites	Leaching through soil, migration in ground water, skin contact, inhalation of contaminant soil dust or contaminated air, ingestion	Site workers, visitors and occupiers, particularly during earthworks, groundwater

Table 1. Conceptual Site Model

4. DETAILED SITE INVESTIGATION

4.1. Sampling and Analysis Plan and Sampling Methodology

Based on the findings from the PSI and recommendations from Geoconsult's geotechnical report, a targeted sampling strategy was selected for the site investigation. Sample locations were chosen to represent areas likely exposed to landfill contamination above the ground water table (GWT). This strategy was selected as the most practical means to quantify and identify the extent of contamination without resorting to excessive sampling.

The following samples were collected on 31/07/2015 via hand augering at four locations across the site and tested for Heavy Metals and Total Petroleum Hydrocarbons (see site plan in Appendix 1):

- Sample A (0.5 – 1.0mbgl) – above GWT
- Sample B (0.7 – 0.9mbgl) – above GWT
- Sample C (0.75 – 1.0mbgl) – above GWT
- Sample D (0.85 – 1.0mbgl) – above GWT

Sample A was collected at 0.5mbgl but a void was noted between 0.6 – 0.75mbgl, therefore the sample was slightly disturbed. Two additional hand auger tests were undertaken in this area, close to Sample location A, and confirmed the presence of a void between approximately 0.5 – 0.75mbgl.

4.2. Field Quality Assurance and Quality Control (QA/QC)

Sample collection, handling and dispatch was undertaken in accordance with the Ministry for the Environment Contaminated Land Management guidelines and referenced documents.
No duplicate or blank sampling was undertaken.
Sampling and decontamination procedures are discussed below.

Samples were collected with a hand auger, which was washed and rinsed in water between sub samples. Latex gloves were worn and changed as required.

Plastic containers provided by Hills Laboratory were utilised with samples dispatched immediately for testing. Each container was labelled with permanent marker stating depth, date, time and sample number. The samples were held in a chilled bin until delivery to the lab. A Chain of Custody (CoC) was completed for the batch of samples.

4.3. Laboratory QA/QC

Refer to Appendix 7 for laboratory documentation and results.

4.4. QA/QC Data Evaluation

One person collected, tagged and bottled all samples.

All samples were tested at the same laboratory.

No decontamination or sampling issues were noted during the investigation. Only Sample A had a sampling issue due to the presence of a void in this area.

5. ENVIRONMENTAL ASSESSMENT

5.1. Basis for Guideline Values

The below soil contaminant standards are used for this site:

1. NES for Assessing and Managing Contaminants in Soil to Protect Human Health (Residential - 10% produce)
2. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Module 4 – Tier 1 soil screening criteria (Residential– all pathways)

These standards are summarised in the Ministry for the Environment – Environmental Guideline Value Database (EVG) which provides an appropriate source of guideline values. The EVG database was compiled in October 2003 and is in need of revision and as a consequence the guideline values may change in the future.

An additional contaminant standard is used for Canterbury Soils:

1. Background concentrations of selected trace elements in Canterbury Soils (ECAN Christchurch soil group 'recent')

Table 2 shows the contaminant guideline values based on residential use.

Contaminant (mg/kg)	**Human Health Residential NES SCS New Zealand risk-based and priority contaminant values**	**Module 4 - Tier 1 soil acceptance criteria for TPH (residential use- All Pathways)**	**Background concentrations for Christchurch Urban recent soil type (Level 2)**
Arsenic (As)	20	-	16.3
Cadmium (Cd)	3	-	0.2
Chromium (Cr)	460	-	20.1
Copper (Cu)	>10000	-	19.5
Lead (Pb)	210	-	128.8
Mercury (Hg)	310	-	0.1
Nickel (Ni)	50[a]	-	18.0
Zinc (Zn)	300[a]	-	166.8
C7-C9	-	500	-
C10-C14	-	510	-

C15-C36	-	<4000	-

Table 2. Contaminant risk based on residential land use ([a]- contaminant levels for soil and GWT, NEPM Australia, updated 2013)

5.2. Results

Laboratory results are compared to NES contaminant standards (SCS) for residential land use with 10% produce, Module 4 for petroleum hydrocarbons and background concentrations in Canterbury (Level 2). Lab results are included in Appendix 7.

A summary of results from the samples analysed for heavy metals are included in Table 3 below. The results are compared to background concentrations and adjusted NES standards for residential land use.

- Chromium and Copper were elevated above background concentration levels but significantly below the NES SCS for residential land use.
- Arsenic in Sample A, B and D and Cadmium in Sample A was elevated above NES SCS concentration levels and background concentration levels.
- Lead, Nickel and Zinc were highly elevated above NES SCS concentration levels and background concentration levels.

			Soil samples			
Heavy metals	**Human Health Commercial NES SCS**	**Background Recent (Level 2)**	**Sample A**	**Sample B**	**Sample C**	**Sample D**
Arsenic	20	16.3	52	45	8	24
Cadmium	3	0.2	3.4	2.1	2.3	1.88
Chromium	460	20.1	85	89	32	41
Copper	>10000	19.5	1080	2400	150	750
Lead	210	128.8	4000	5000	1010	4600
Nickel	50[a]	18.0	81	89	71	62
Zinc	300[a]	166.8	2800	4000	830	2900

Table 3. Summary of test results for heavy metals (mg/kg)

A summary of results from the total petroleum hydrocarbon tests are included in Table 4 below. The results are compared to NES Module 4 – Tier 1 soil acceptance criteria for TPH. All samples were recorded below the Tier 1 soils acceptance criteria for TPH.

TPH Sample	C7 – C9	C10 – C14	C14 – C36	Total hydrocarbons (C7 – C36)
A	<8	<20	390	390
B	<8	<20	890	890
C	<9	<20	2500	2500
D	<8	22	2300	2400
Tier 1 soil acceptance criteria for TPH	500	510	<4000	-

Table 4. Summary of test results for TPH (mg/kg)

5.3. Site Characterisation

This report finds that Hazardous Activities have occurred on the site as per the detailed site investigation. Based on the detailed site investigation, key human health and environmental receptors are likely to be at risk of exposure to unacceptable levels of arsenic, cadmium, lead, nickel and zinc.

5.4. Proposed Remediation Action Plan

It is recommended that the contaminated soil is not removed and disposed to landfill due to the following reasons:

1. The volume of soil requiring remediation is expected to exceed 600m^3. This will require resource consent in accordance with the MfE National Environmental Standard for Contaminants on Soil (2011).
2. Burwood Landfill will not accept soil with this level of contamination, therefore soil will need to be disposed to Kate Valley Landfill, approx. 2 hour return trip from site.

Since removal of the soil is not economically viable or time efficient it is recommended to proceed with a new foundation design which will limit the volume of earthworks required on the site.

A specific engineer designed pile solution is recommended where the piles will be driven through the fill material into a competent non-liquefiable founding layer (q_c >15MPa). The following points should be considered within this design:

- A deep geotechnical investigation will be required to confirm the presence of a founding layer.
- The current structure should be demolished.
- Topsoil should be excavated and removed up to 1.0m outside of the building footprint (topsoil depth approx. 300mm).

- The ground should be excavated within the building footprint to a total depth of 500mm. This fill material (approx. 200mm) should be disposed of to an appropriate landfill facility or spread onsite and covered by surplus topsoil.
- Piles should be driven through this to a dense non liquefiable founding layer.
- A 300mm gravel raft should be constructed.
- This should be capped with a concrete slab 400-500mm thick.
- Topsoil should be placed again.
- The site should be put on the LLUR and a covenant placed on the title.

6. CONCLUSION AND RECOMMENDATIONS

The preliminary site investigation finds:

- The soil conditions on site are similar to s 9(2)(a) which is noted on the LLUR as G3 – Landfill Sites. Therefore hazardous acitivites have been undertaken on this site, similar to s 9(2)(a) .
- The groundwater table is likely to be 1.5mbgl.
- The aquifer has been assessed as s 9(2)(a)

The targeted detailed site investigation finds:

- Arsenic in Sample A, B and D and Cadmium in Sample A was elevated above NES SCS concentration levels and background concentration levels.
- Lead, Nickel and Zinc were highly elevated above NES SCS concentration levels and background concentration levels.
- Chromium and Copper concentrations are above background concentration levels for recent soils in Canterbury but significantly lower than the NES SCS standards for a residential site.
- TPH concentrations in the soil samples are significantly lower than NES – Module 4 Tier 1 acceptance criteria.

In summary key human health and environmental receptors are likely to be at risk of exposure to unacceptable levels of arsenic, cadmium, lead, nickel and zinc.

A specific engineer designed piled foundation should be considered as part of a remediation action plan instead of excavation and removal of the contaminated soil.

The site should be placed on the LLUR and a covenant placed on the title.

7. LIMITATIONS

This report has been prepared for the benefit of Insurerbuild as our client with respect to Preliminary and Detailed Site investigation Report. It shall not be relied upon for any other purpose. The reliance by other parties on the information or opinions contained in this report shall, without our prior review and agreement in writing, be at such parties' sole risk.

Opinions and judgments expressed herein are based on our understanding and interpretation of current regulatory standards, and should not be construed as legal opinions. Where opinions or judgments are to be relied on they should be independently verified with appropriate legal advice

The nature and continuity of subsoil conditions is inferred and it must be appreciated that actual conditions could vary considerably from the assumed model.

During excavation and construction the site should be examined by an Engineer or Engineering Geologist competent to judge whether the exposed subsoils are compatible with the inferred conditions on which the report has been based. It is possible that the nature of the exposed subsoils may require further investigation and the modification of the design based on this report.

Cook Costello Ltd would be pleased to provide this service to Industrial Oils NZ and believe that the project would benefit from such continuity. In any event it is essential that the firm is contacted if there is any variation in subsoil conditions from those described in the report as it may affect the design parameters recommended in the report.

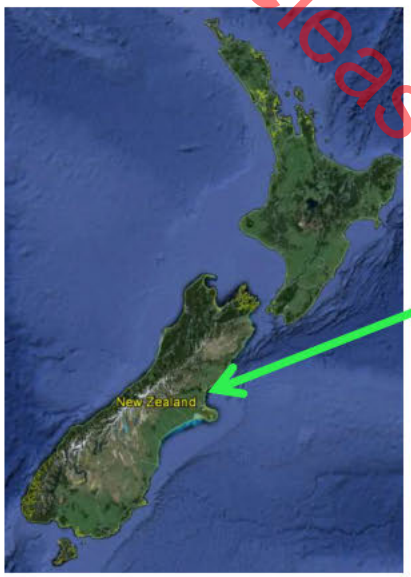
Cook Costello Ltd. have performed the services for this project in accordance with the standard agreement for consulting services and current professional standards for environmental site assessment. No guarantees are either expressed or implied.

There is no investigation which is thorough enough to preclude the presence of materials at the site which presently, or in the future, may be considered hazardous. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants present and considered to be acceptable now may in the future become subject to different regulatory standards which cause them to become unacceptable and require further remediation for this site to be suitable for the existing or proposed land use activities.

M Thrush
Engineer (Geotechnical/Environmental)
BEng (Civil), MSc (Water Resources Mngt), GIPENZ

T Smith
Chartered Professional Engineer
NZIM Dip Mgmt, NZCE (Civil), MIPENZ, CPEng, MIOD

APPENDIX 1 : SITE PLAN



SITE LOCATION

s 9(2)(a)

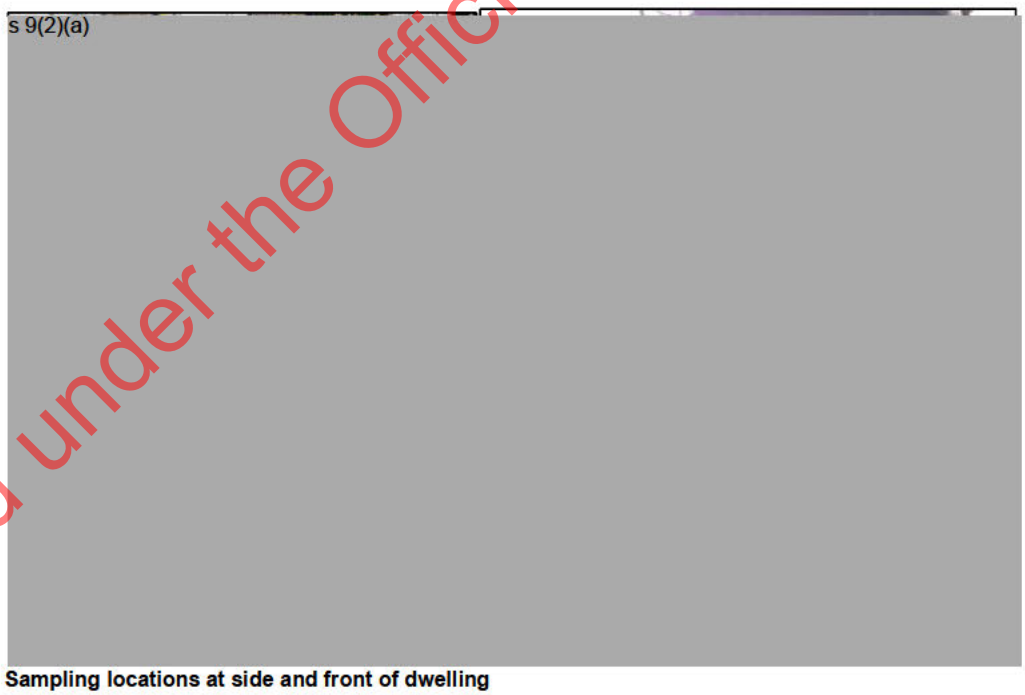
s 9(2)(a)

[redacted] LES:	Not To Scale		Environmental Ground Investigation	DATE:	17/09/2015
DRAWN:	MT	09/15	SITE LOCATION PLAN	CCL JOB No:	12202-103
			Address: [redacted] s 9(2)(a)	cook | costello Consulting Engineers	Rev.0

SCALES:	Not To Scale		Environmental Ground Investigation		DATE:	17/09/2015	
DRAWN:	MT	09/15	SAMPLE LOCATION PLAN	cook | costello Consulting Engineers	CCL JOB No:	12202-103	
			Address: s 9(2)(a)				Rev.0

APPENDIX 2 : SITE PHOTOGRAPHS

Sample locations taken within rear garden area, behind dwelling



Sampling locations at side and front of dwelling

APPENDIX 3 : HISTORIC AERIAL AND SATELLITE IMAGES

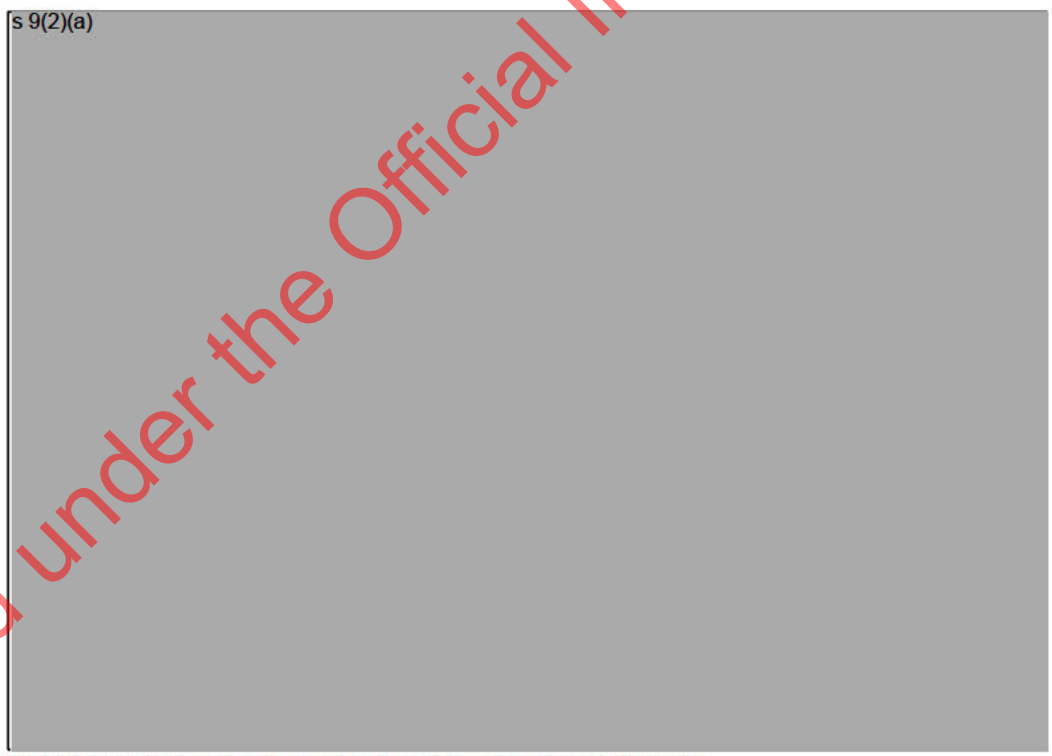
1941 Aerial Imagery showing a dwelling on the site (highlighted blue)

1946 Aerial Imagery showing a dwelling on the site (highlighted blue)

1955 Aerial Imagery showing a dwelling on the site (highlighted blue)

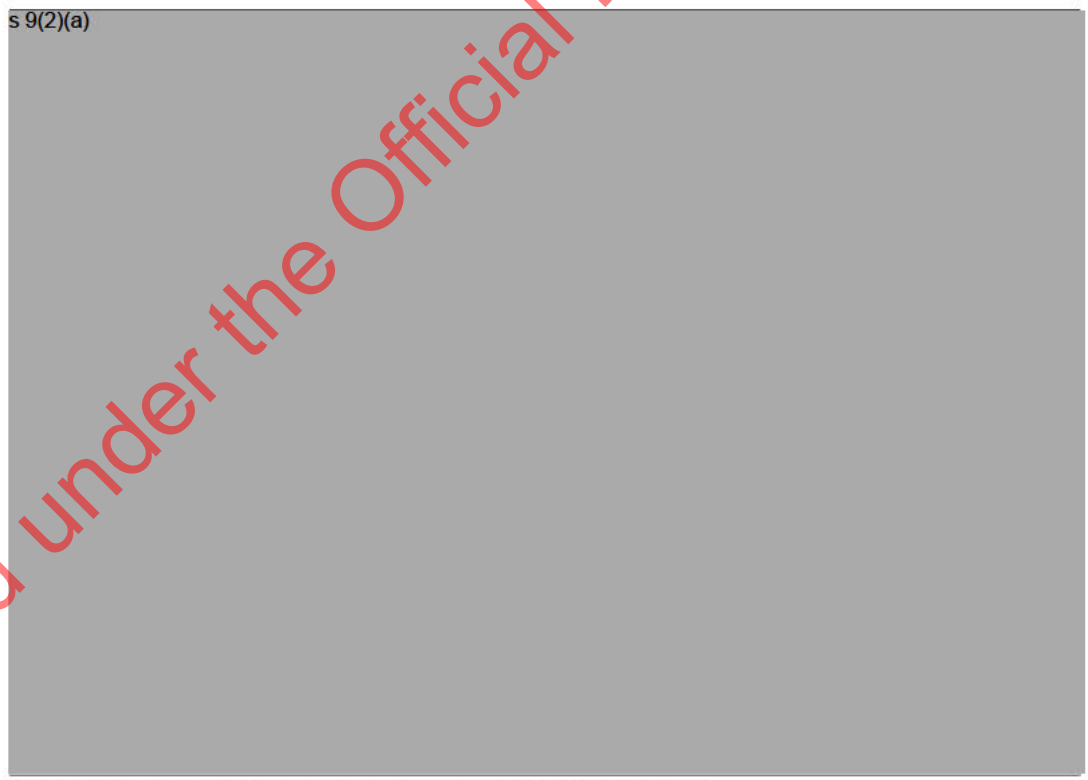
1965 Aerial Imagery showing a dwelling on the site (highlighted blue)

1973 Aerial Imagery showing a dwelling on the site (highlighted blue)



1984 Aerial Imagery showing a dwelling on the site (highlighted blue)

1994 Aerial Imagery showing a dwelling on the site (highlighted blue)



2011 Aerial Imagery showing a dwelling on the site (highlighted blue)

APPENDIX 4 : ENVIRONMENT CANTERBURY LISTED LAND USE REGISTER (LLUR)

19-D-02771

Property Statement from the Listed Land Use Register

Visit www.ecan.govt.nz/HAIL for more information about land uses.

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Customer Services
P. 03 353 9007 or 0800 324 636

PO Box 345
Christchurch 8140

P. 03 365 3828
F. 03 365 3194
E. ecinfo@ecan.govt.nz

www.ecan.govt.nz

Date: 07 July 2015

Land Parcels: s 9(2)(a)

The information presented in this map is specific to the property you have selected. Information on nearby properties may not be shown on this map, even if the property is visible.

Summary of sites:

There are no sites associated with the area of enquiry.

Information held about the sites on the Listed Land Use Register

There are no sites associated with the area of enquiry.

Information held about other investigations on the Listed Land Use Register

For further information from Environment Canterbury, contact Customer Services and refer to enquiry number s 9(2)(a)

Disclaimer: ***The enclosed information is derived from Environment Canterbury's Listed Land Use Register and is made available to you under the Local Government Official Information and Meetings Act 1987 and Environment Canterbury's Contaminated Land Information Management Strategy (ECan 2009).***

The information contained in this report reflects the current records held by Environment Canterbury regarding the activities undertaken on the site, its possible contamination and based on that information, the categorisation of the site. Environment Canterbury has not verified the accuracy or completeness of this information. It is released only as a copy of Environment Canterbury's records and is not intended to provide a full, complete or totally accurate assessment of the site. It is provided on the basis that Environment Canterbury makes no warranty or representation regarding the reliability, accuracy or completeness of the information provided or the level of contamination (if any) at the relevant site or that the site is suitable or otherwise for any particular purpose. Environment Canterbury accepts no responsibility for any loss, cost, damage or expense any person may incur as a result of the use, reference to or reliance on the information contained in this report.

Any person receiving and using this information is bound by the provisions of the Privacy Act 1993.

19-D-02771

Property Statement from the Listed Land Use Register

Visit www.ecan.govt.nz/HAIL for more information about land uses.

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Customer Services
P. 03 353 9007 or 0800 324 636

PO Box 345
Christchurch 8140

P. 03 365 3828
F. 03 365 3194
E. ecinfo@ecan.govt.nz

www.ecan.govt.nz

Date:	07 July 2015
Land Parcels:	s 9(2)(a)

The information presented in this map is specific to the property you have selected. Information on nearby properties may not be shown on this map, even if the property is visible.

Summary of sites:

Site ID	Site Name	Location	HAIL Activity(s)	Category
s 9(2)(a)			G3 - Landfill sites;	Contaminated - Residential

Please note that the above table represents a summary of sites and HAILs intersecting the area of enquiry only.

Information held about the sites on the Listed Land Use Register

s 9(2)(a) **Christchurch** (Intersects enquiry area.)

Site Address:	s 9(2)(a) Christchurch
Legal Description(s):	

19-D-02771

Site Category:	Contaminated - Residential
Definition:	Site investigation demonstrates that the land is significantly contaminated.

Land Uses (from HAIL):

Period From	Period To	HAIL land use
Pre 1941	Pre 1941	Landfill sites

Notes:

1 Jul 2015 Evidence that the property is located on a historical landfill includes the presence of trace glass, brick, shell, concrete, metal and charcoal encountered between approximately 0.2 and 2.0 metres below ground level during site investigation activities performed by Geoscience Consulting (NZ) in September 2014. In addition, the general area bounded by s 9(2)(a) to the south, s 9(2)(a) to the west is shown as an unidentified shallow landfill on a map of Christchurch landfill sites prepared by Tonkin & Taylor in February 2000. The landfill likely operated between 1900 and the 1930s and is not evident in the earliest aerial photograph available for the area (1941).

Investigations:

3 Nov 2014 **INV 98475: Environmental Soil Investigation at** s 9(2)(a) **Christchurch** (Detailed Site Investigation)
ENGEO

Summary of investigation(s):

In September 2014, Geoscience (ENGEO) performed a detailed site investigation to assess whether or not NES consent was required to control soil disturbance/earthworks during construction activities at the site and to inform soil disposal requirements/options. Four shallow boreholes were advanced with a hand auger to depths of between 0.3 and 1.9 metres below ground level (m bgl). Evidence of historical landfilling in the form of trace glass, brick, shell, concrete, metal and charcoal was found between 0.2 and 2.0 m bgl in each borehole.

Soil from each of the four boreholes was composited at the laboratory to constitute a single sample that was then analysed for heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc) and polycyclic aromatic hydrocarbons (PAH). Reported cadmium, lead, arsenic and benzo(a) pyrene equivalent (∑BaP) concentrations in the composite sample exceeded applicable NES soil contaminant standards (SCSs) for residential land use after adjustment for compositing. Subsequent analysis of the four subsamples for arsenic, cadmium, lead and PAH indicated that reported lead concentrations significantly exceeded the applicable SCS in each of the four samples with reported arsenic, cadmium and ∑BaP concentrations exceeding applicable SCSs in two or more samples.

Not all areas of the property investigated were subject to soil sampling, however the information gathered from the extent of the site sampled was sufficient to demonstrate the presence of significant shallow heavy metals and PAH contamination.

Information held about other investigations on the Listed Land Use Register

For further information from Environment Canterbury, contact Customer Services and refer to enquiry number s 9(2)(a)

Disclaimer:

The enclosed information is derived from Environment Canterbury's Listed Land Use Register and is made available to you under the Local Government Official Information and Meetings Act 1987 and Environment Canterbury's Contaminated Land Information Management Strategy (ECan 2009).

The information contained in this report reflects the current records held by Environment Canterbury regarding the activities undertaken on the site, its possible contamination and based on that information, the categorisation of the site. Environment Canterbury has not verified the accuracy or completeness of this information. It is released only as a copy of Environment Canterbury's records and is not intended to provide a full, complete or totally accurate assessment of the site. It is provided on the basis that Environment Canterbury makes no warranty or representation regarding the reliability, accuracy or completeness of the information provided or the level of contamination (if any) at the relevant site or that the site is suitable or otherwise for any particular purpose. Environment Canterbury accepts no responsibility for any loss, cost, damage or expense any person may incur as a result of the use, reference to or reliance on the information contained in this report.

Any person receiving and using this information is bound by the provisions of the Privacy Act 1993.

APPENDIX 5 : SCIRT'S DEWATERING CONTAMINATION RISK MAP AND G3 LANDFILL SITES MAP

New Zealand Government

Christchurch City Council

Dewatering Contamination Risk

SCIRT
Rebuilding Infrastructure

Printed: 14/08/2015 11:17

s 9(2)(a)

New Zealand Government

Christchurch City Council

Printed: 14/08/2015 11:22

G3 Landfill Sites

s 9(2)(a) not included

SCIRT
Rebuilding Infrastructure

APPENDIX 6 : NEARBY CGD LOGS

Job No: CG115

Job: s 9(2)(a)

BOREHOLE LOG HA1

Soil Group		SOIL SYMBOL	DEPTH (m)	GROUNDWATER	• Peak Corrected Vane Shear Strength(kPa) o Remoulded Corrected Vane Shear Strength(kPa) 50 100 150 200
NON ENGINEERED FILL	Topsoil; Some brick fragments; Trace wood fragments; Dark brown speckled red; Dry; Friable Non plastic				
	SILT; Some topsoil; minor fine to coarse sand; Trace medium gravels; Trace fiberglass; Light greyish brown; Mottled dark brown		1		
	Silty SAND; Some coarse sand to fine gravels; Dark brown; Dry; Friable				
	E.O.HA 1.4m Obstruction (concrete fragment recovered from this depth)		2 3 4 5		

NOTES:

Geoconsult GEOTECHNICAL CONSULTANTS

Date: 21/04/2015 Logged by: WJS

Job No: CG115

Job: s 9(2)(a)

BOREHOLE LOG HA2

Soil Group		SOIL SYMBOL	DEPTH (m)	GROUNDWATER	• Peak Corrected Vane Shear Strength(kPa) o Remoulded Corrected Vane Shear Strength(kPa) 50 100 150 200
NON-ENG FILL	Topsoil; Minor coarse sand to fine gravels (rounded); Trace shell fragments; Trace fine gravel-sized brick fragments; Dark brown; Dry; Non-plastic; Friable Below 0.5m - Minor coarse gravel sized concrete fragments		0		
	E.O.HA 0.7m Obstruction; Several attempts made (Brick marks visible on hand auger)		1 2 3 4 5		

NOTES: NON-ENG FILL - Non engineered fill

Geoconsult GEOTECHNICAL CONSULTANTS

Date: 21/04/2015 Logged by: WJS

Job No: CG115

Job: s 9(2)(a)

BOREHOLE LOG HA3

Soil Group		SOIL SYMBOL	DEPTH (m)	GROUNDWATER	• Peak Corrected Vane Shear Strength(kPa) o Remoulded Corrected Vane Shear Strength(kPa) 50 100 150 200
NON-ENG FILL	Topsoil; Dark brown; Trace to minor brick; Wood and concrete fragments (fine to coarse in size) Dark brown speckled black grey and red				
	E.O.HA 0.7m Obstruction		1 2 3 4 5		

NOTES: NON-ENG FILL - Non engineered fill

Geoconsult GEOTECHNICAL CONSULTANTS

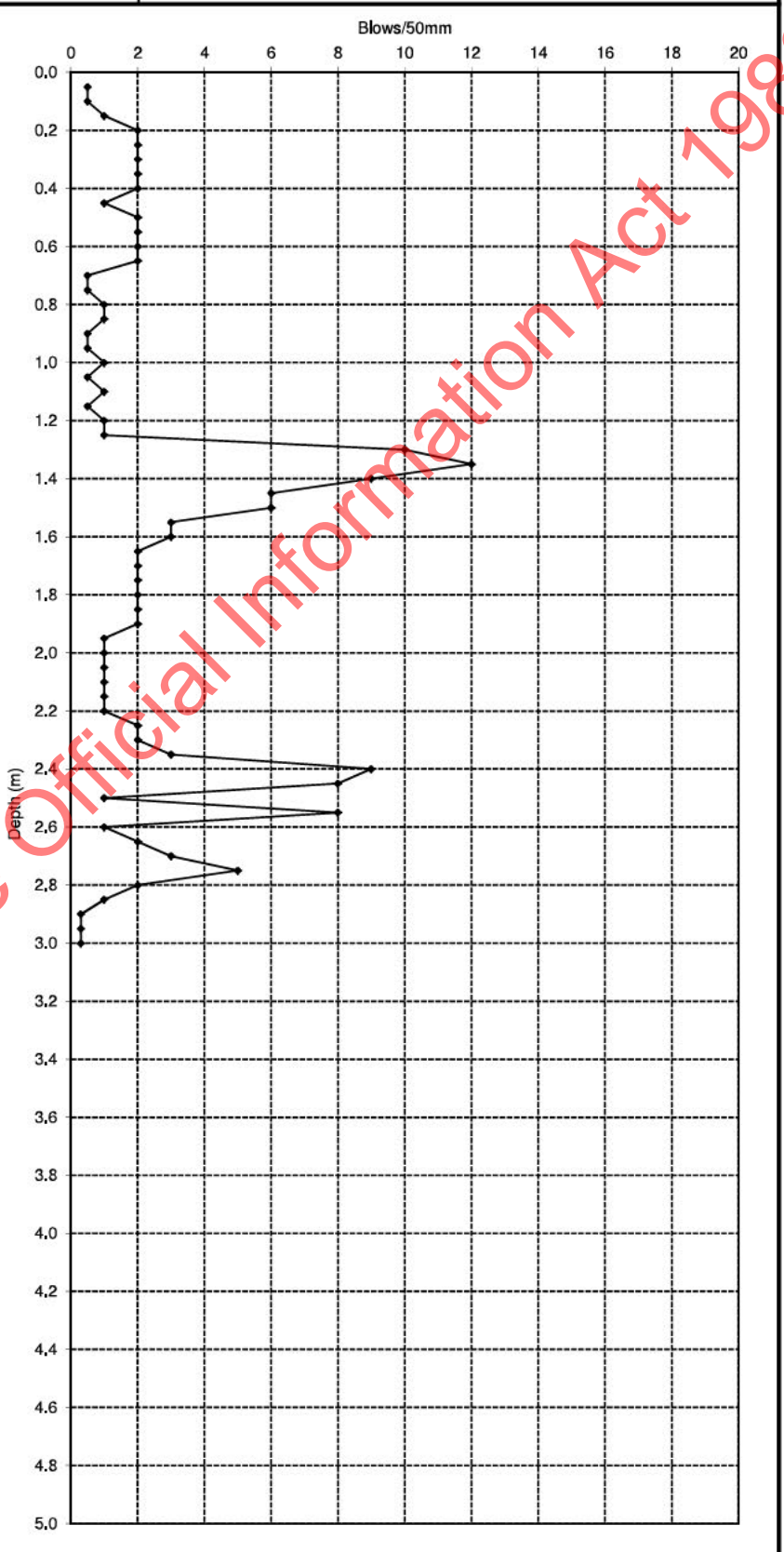
Date: 21/04/2015 Logged by: WJS

SCALA PENETROMETER PROBE TEST

No. SP1

Test Location:	Test carried out By: WJS	GCL. ref.:	CG115
N:	Logged by: WJS	Project:	s 9(2)(a)
E:	Checked by: WJS	Location:	
Elevation:	Date of test: 21/04/2015	Client:	Kontari Consulting
Datum:		Client ref.:	CG115

Depth (m)	Blows/ 50 mm	Depth (m)	Blows/ 50 mm	Depth (m)	Blows/ 50 mm
0.05	0.5	3.05		6.05	
0.10	0.5	3.10		6.10	
0.15	1	3.15		6.15	
0.20	2	3.20		6.20	
0.25	2	3.25		6.25	
0.30	2	3.30		6.30	
0.35	2	3.35		6.35	
0.40	2	3.40		6.40	
0.45	1	3.45		6.45	
0.50	2	3.50		6.50	
0.55	2	3.55		6.55	
0.60	2	3.60		6.60	
0.65	2	3.65		6.65	
0.70	0.5	3.70		6.70	
0.75	0.5	3.75		6.75	
0.80	1	3.80		6.80	
0.85	1	3.85		6.85	
0.90	0.5	3.90		6.90	
0.95	0.5	3.95		6.95	
1.00	1	4.00		7.00	
1.05	0.5	4.05		7.05	
1.10	1	4.10		7.10	
1.15	0.5	4.15		7.15	
1.20	1	4.20		7.20	
1.25	1	4.25		7.25	
1.30	10	4.30		7.30	
1.35	12	4.35		7.35	
1.40	9	4.40		7.40	
1.45	6	4.45		7.45	
1.50	6	4.50		7.50	
1.55	3	4.55		7.55	
1.60	3	4.60		7.60	
1.65	2	4.65		7.65	
1.70	2	4.70		7.70	
1.75	2	4.75		7.75	
1.80	2	4.80		7.80	
1.85	2	4.85		7.85	
1.90	2	4.90		7.90	
1.95	1	4.95		7.95	
2.00	1	5.00		8.00	
2.05	1	5.05		8.05	
2.10	1	5.10		8.10	
2.15	1	5.15		8.15	
2.20	1	5.20		8.20	
2.25	2	5.25		8.25	
2.30	2	5.30		8.30	
2.35	3	5.35		8.35	
2.40	9	5.40		8.40	
2.45	8	5.45		8.45	
2.50	1	5.50		8.50	
2.55	8	5.55		8.55	
2.60	1	5.60		8.60	
2.65	2	5.65		8.65	
2.70	3	5.70		8.70	
2.75	5	5.75		8.75	
2.80	2	5.80		8.80	
2.85	1	5.85		8.85	
2.90	0.3	5.90		8.90	
2.95	0.3	5.95		8.95	
3.00	0.3	6.00		9.00	



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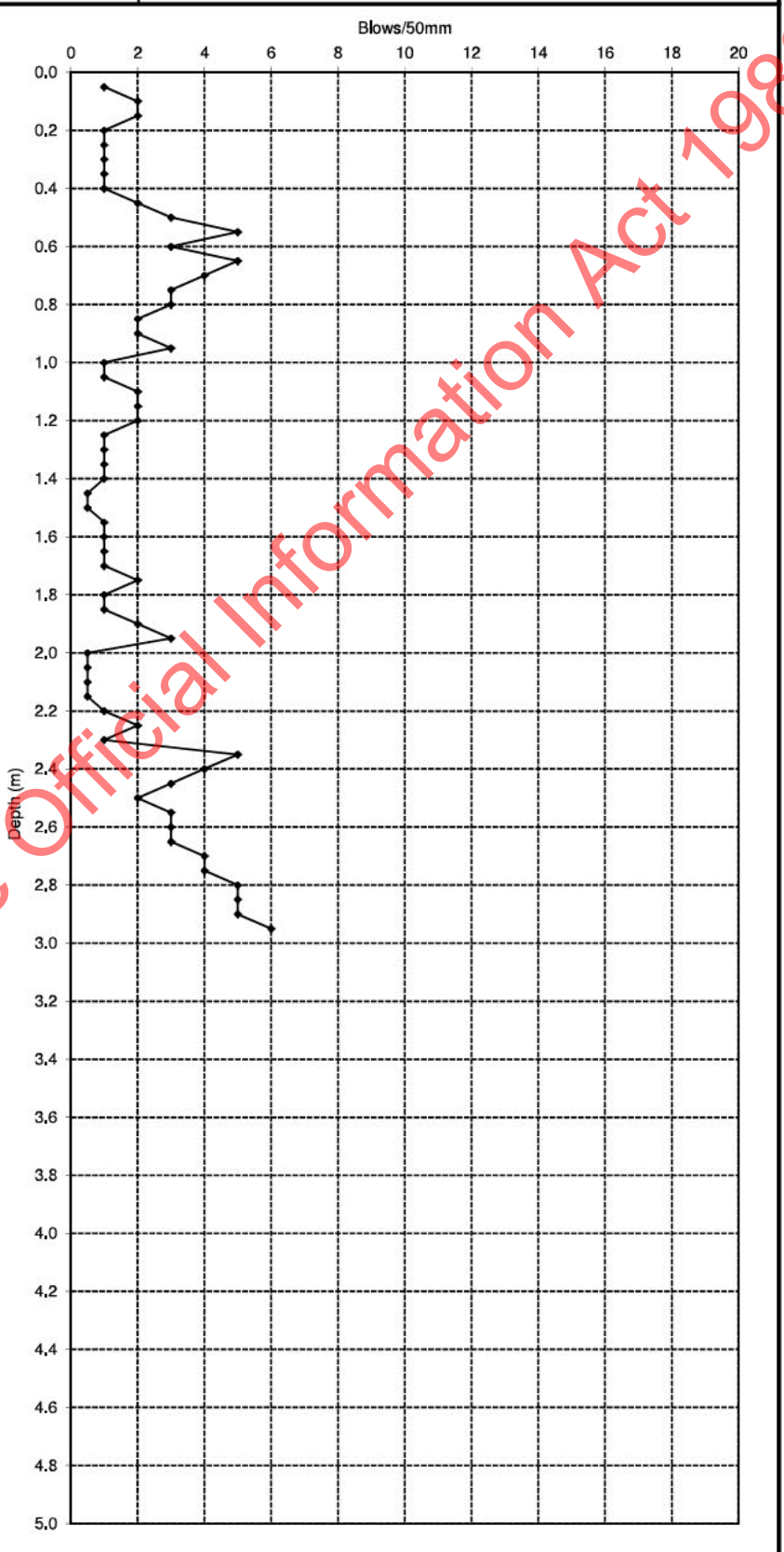
Remarks:

SCALA PENETROMETER PROBE TEST

No. SP2

Test Location:	Test carried out By: WJS	GCL. ref.:	CG115
N:	Logged by: WJS	Project:	s 9(2)(a)
E:	Checked by: WJS	Location:	
Elevation:	Date of test: 21/04/2015	Client:	Kontari Consulting
Datum:		Client ref.:	CG115

Depth (m)	Blows/ 50 mm	Depth (m)	Blows/ 50 mm	Depth (m)	Blows/ 50 mm
0.05	1	3.05		6.05	
0.10	2	3.10		6.10	
0.15	2	3.15		6.15	
0.20	1	3.20		6.20	
0.25	1	3.25		6.25	
0.30	1	3.30		6.30	
0.35	1	3.35		6.35	
0.40	1	3.40		6.40	
0.45	2	3.45		6.45	
0.50	3	3.50		6.50	
0.55	5	3.55		6.55	
0.60	3	3.60		6.60	
0.65	5	3.65		6.65	
0.70	4	3.70		6.70	
0.75	3	3.75		6.75	
0.80	3	3.80		6.80	
0.85	2	3.85		6.85	
0.90	2	3.90		6.90	
0.95	3	3.95		6.95	
1.00	1	4.00		7.00	
1.05	1	4.05		7.05	
1.10	2	4.10		7.10	
1.15	2	4.15		7.15	
1.20	2	4.20		7.20	
1.25	1	4.25		7.25	
1.30	1	4.30		7.30	
1.35	1	4.35		7.35	
1.40	1	4.40		7.40	
1.45	0.5	4.45		7.45	
1.50	0.5	4.50		7.50	
1.55	1	4.55		7.55	
1.60	1	4.60		7.60	
1.65	1	4.65		7.65	
1.70	1	4.70		7.70	
1.75	2	4.75		7.75	
1.80	1	4.80		7.80	
1.85	1	4.85		7.85	
1.90	2	4.90		7.90	
1.95	3	4.95		7.95	
2.00	0.5	5.00		8.00	
2.05	0.5	5.05		8.05	
2.10	0.5	5.10		8.10	
2.15	0.5	5.15		8.15	
2.20	1	5.20		8.20	
2.25	2	5.25		8.25	
2.30	1	5.30		8.30	
2.35	5	5.35		8.35	
2.40	4	5.40		8.40	
2.45	3	5.45		8.45	
2.50	2	5.50		8.50	
2.55	3	5.55		8.55	
2.60	3	5.60		8.60	
2.65	3	5.65		8.65	
2.70	4	5.70		8.70	
2.75	4	5.75		8.75	
2.80	5	5.80		8.80	
2.85	5	5.85		8.85	
2.90	5	5.90		8.90	
2.95	6	5.95		8.95	
3.00		6.00		9.00	



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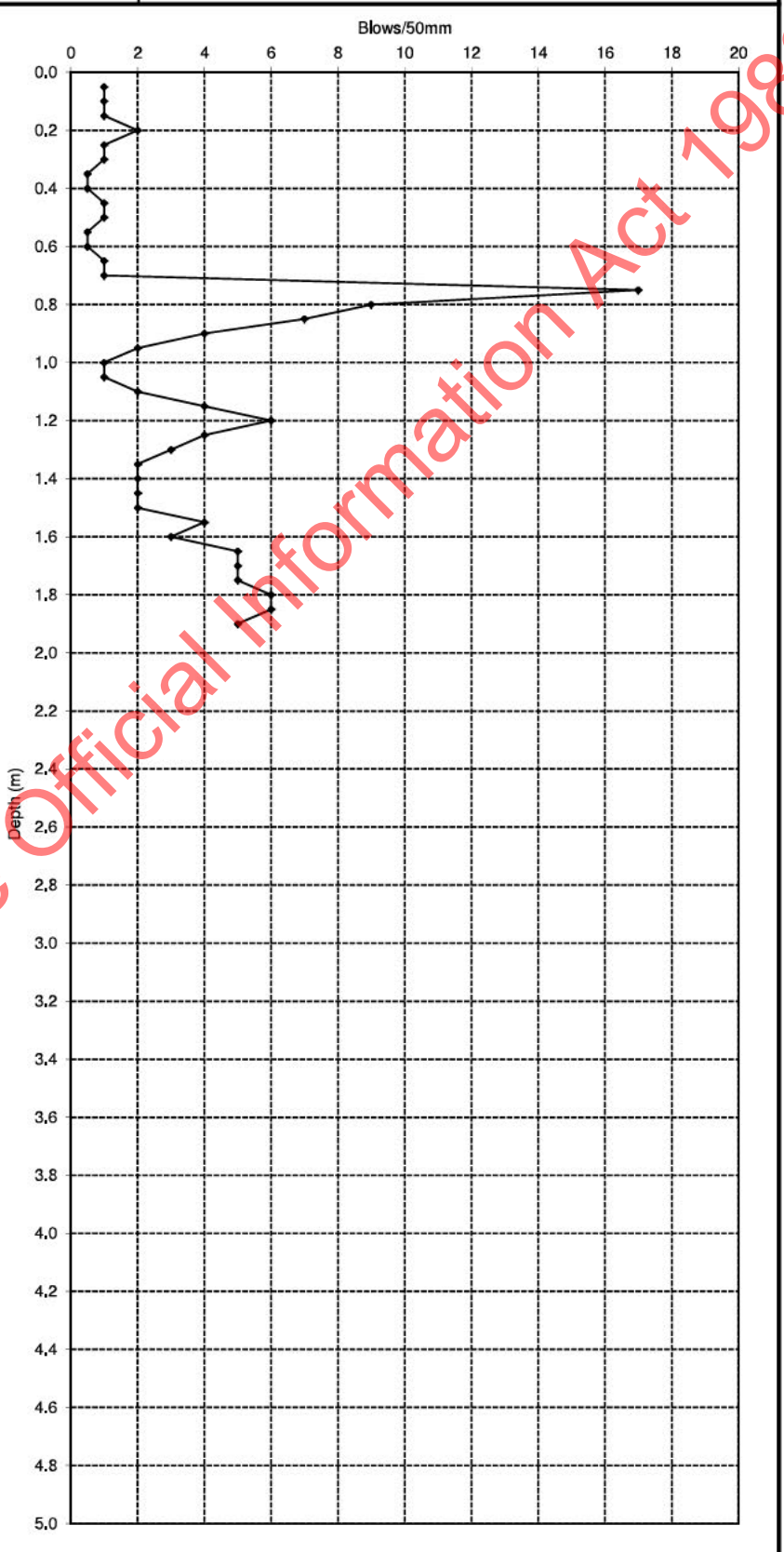
Remarks:

SCALA PENETROMETER PROBE TEST

No. SP3

Test Location:	Test carried out By: WJS	GCL. ref.:	CG115
N:	Logged by: WJS	Project:	s 9(2)(a)
E:	Checked by: WJS	Location:	
Elevation:	Date of test: 21/04/2015	Client:	Kontari Consulting
Datum:		Client ref.:	CG115

Depth (m)	Blows/ 50 mm	Depth (m)	Blows/ 50 mm	Depth (m)	Blows/ 50 mm
0.05	1	3.05		6.05	
0.10	1	3.10		6.10	
0.15	1	3.15		6.15	
0.20	2	3.20		6.20	
0.25	1	3.25		6.25	
0.30	1	3.30		6.30	
0.35	0.5	3.35		6.35	
0.40	0.5	3.40		6.40	
0.45	1	3.45		6.45	
0.50	1	3.50		6.50	
0.55	0.5	3.55		6.55	
0.60	0.5	3.60		6.60	
0.65	1	3.65		6.65	
0.70	1	3.70		6.70	
0.75	17	3.75		6.75	
0.80	9	3.80		6.80	
0.85	7	3.85		6.85	
0.90	4	3.90		6.90	
0.95	2	3.95		6.95	
1.00	1	4.00		7.00	
1.05	1	4.05		7.05	
1.10	2	4.10		7.10	
1.15	4	4.15		7.15	
1.20	6	4.20		7.20	
1.25	4	4.25		7.25	
1.30	3	4.30		7.30	
1.35	2	4.35		7.35	
1.40	2	4.40		7.40	
1.45	2	4.45		7.45	
1.50	2	4.50		7.50	
1.55	4	4.55		7.55	
1.60	3	4.60		7.60	
1.65	5	4.65		7.65	
1.70	5	4.70		7.70	
1.75	5	4.75		7.75	
1.80	6	4.80		7.80	
1.85	6	4.85		7.85	
1.90	5	4.90		7.90	
1.95		4.95		7.95	
2.00		5.00		8.00	
2.05		5.05		8.05	
2.10		5.10		8.10	
2.15		5.15		8.15	
2.20		5.20		8.20	
2.25		5.25		8.25	
2.30		5.30		8.30	
2.35		5.35		8.35	
2.40		5.40		8.40	
2.45		5.45		8.45	
2.50		5.50		8.50	
2.55		5.55		8.55	
2.60		5.60		8.60	
2.65		5.65		8.65	
2.70		5.70		8.70	
2.75		5.75		8.75	
2.80		5.80		8.80	
2.85		5.85		8.85	
2.90		5.90		8.90	
2.95		5.95		8.95	
3.00		6.00		9.00	



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Remarks:

s 9(2)(a)

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KONTARI CONSULTING ENGINEERS
REPAIR/REPLACEMENT OF DWELLING

s 9(2)(a)

SITE PLAN

SCALE (A3): NTS

	BY	DATE
DRAWN	RH	APR 15
CHECKED	WJS	APR 15

DRAWING No. CG115/1

SHEET 1 OF 1

⊕ = Test Location

Note: All images sourced from Google Maps

GEOSCIENCE
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Date	Apr-13	**Client**	Arrow International (NZ) Ltd		
Drawn by	JR	**Project**	Southern Response		
Approved by	RC	**Description**	**Site Location Plan**		
Scale	NTS	**Geoscience Ref.**	9653	**Client Ref.**	D3423475

GEOSCIENCE
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HAND AUGER BOREHOLE - HA01

(Page 1 of 2)

s 9(2)(a)

D3423475

Client	: Arrow International	**Date**	: 26/03/13
Project	: Southern Response	**Hole Depth**	: 1.2 m
Geoscience Ref.	: 9653.000.752	**Shear Vane No.**	: N/A
Drilling Method	: Hand auger	**Logged By**	: JCL/EG
Hole Diameter	: 50 mm	**Reviewed By**	: JR

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Log	Water Level	Moisture Condition	Shear Vane (kPa) Peak/Remolded	Consistency / Density Index	Scala Penetrometer Blows per 100 mm
0.0	TS	ML	SILT with trace gravel and rootlets; brown [TOPSOIL].						
	FILL	ML	SILT with trace gravel, charcoal, brick and wood; brown [FILL].			D		N/A	
0.5		ML	SILT with trace sand, gravel, clinker and brick; dark brown [FILL].						
1.0		ML	Becomes moist at 0.9 m depth.			M			
			EOH: 1.2 m depth.						
1.5									
2.0									
2.5									
3.0									

Scala Penetrometer Blows per 100 mm: 0 2 4 6 8 10 12 14

Termination: Practical Refusal
Hand auger and Scala Penetrometer met practical refusal on inferred fill at 1.2 m depth.
Groundwater not encountered
TS = TOPSOIL

s 9(2)(a)

04-10-2013 X:\Projects\9653.000.000 Southern Response - Arrow\7_Golder Sites\D3423475

GEOSCIENCE
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HAND AUGER BOREHOLE - HA02

s 9(2)(a)

D3423475

Client	: Arrow International	**Date**	: 26/03/13
Project	: Southern Response	**Hole Depth**	: 3.0 m
Geoscience Ref.	: 9653.000.752	**Shear Vane No.**	: N/A
Drilling Method	: Hand auger	**Logged By**	: EG/JCL
Hole Diameter	: 50 mm	**Reviewed By**	: JR

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Log	Water Level	Moisture Condition	Shear Vane (kPa) Peak/Remolded	Consistency / Density Index	Scala Penetrometer Blows per 100 mm
0.0	TOPSOIL	ML	SILT with trace clinker, gravel and rootlets; greyish brown [TOPSOIL].					N/A	
0.5	ALLUVIUM	SP	Fine SAND; light grey. Poorly graded, subrounded to subangular.			D		L-D	
			Orange mottles encountered at 0.9 m depth.						
1.0									
1.5			Becomes moist at 1.5 m depth.			M			
			Sand becomes fine to medium.						
2.0			Becomes wet at 2.1 m depth.			W			
2.5			Becomes saturated and dark grey at 2.5 m depth.		▼	S			
3.0			EOH: 3.0 m depth.						

Termination: Target Depth
Hand auger and Scala Penetrometer met target depth at 3.0 m depth.
Groundwater encountered at 2.5 m depth.

s 9(2)(a)

04-10-2013 X:\Projects\9653.000.000 Southern Response - Arrow\7_Golder Sites\D3423475

19-D-02771

GEOSCIENCE
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Scala Penetrometer Testing

Client: Arrow International Ltd
Project: Southern Response
Site address: s 9(2)(a)
Location: Refer to Site Location Plan

Geoscience ref: 9653
Client ref: D3423475
Date: 26/03/2013
By: JCL/EG

Test No.	HA01	Test No.	HA02	Test No.	SP03	Test No.	SP04
Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows	Depth (mm)	Blows
100	5	100	3	100	2	100	3
200	8	200	2	200	2	200	6
300	7	300	3	300	2	300	5
400	6	400	3	400	2	400	3
500	5	500	2	500	1	500	4
600	3	600	4	600	1	600	2
700	3	700	3	700	3	700	2
800	2	800	3	800	1	800	1
900	7	900	4	900	7	900	2
1000	3	1000	3	1000	6	1000	1
1100	4	1100	3	1100	7	1100	2
1200	15	1200	2	1200	15	1200	3
1300		1300	3	1300		1300	1
1400		1400	3	1400		1400	2
1500		1500	2	1500		1500	2
1600		1600	2	1600		1600	5
1700		1700	2	1700		1700	0
1800		1800	2	1800		1800	0
1900		1900	2	1900		1900	1
2000		2000	3	2000		2000	1
2100		2100	4	2100		2100	1
2200		2200	4	2200		2200	3
2300		2300	4	2300		2300	5
2400		2400	3	2400		2400	4
2500		2500	3	2500		2500	5
2600		2600	6	2600		2600	5
2700		2700	6	2700		2700	7
2800		2800	6	2800		2800	15
2900		2900	7	2900		2900	
3000		3000	8	3000		3000	
3100		3100		3100		3100	
3200		3200		3200		3200	
3300		3300		3300		3300	
3400		3400		3400		3400	
3500		3500		3500		3500	
3600		3600		3600		3600	
3700		3700		3700		3700	
3800		3800		3800		3800	
3900		3900		3900		3900	
4000		4000		4000		4000	

19-D-02771

Golder Associates

Soil Borehole Log

Location: s 9(2)(a) Christchurch

Reference: GA_RO_8493

s 9(2)(a)

Elevation (m): 9
Hole Depth (m): 15.95
Orientation (°): -
Inclination (°): 90

Grid: NZTM

Datum: Ground

Formation	Graphic Log	Description	USC	Moisture Condition	Consistency / Density	Water Observations	Depth	TCR (%)	SPT N-value (Uncorrected)	Samples & In-situ Testing	Backfill & Installation
	TS	Clayey organic TOPSOIL; dark brown. Soft; moist to wet; low plasticity.	OL	M-W			0.00				
		Sandy gravelly SILT with some brick and organics (FILL); dark brown with red. Soft; wet; low plasticity; sand, fine; gravel, subrounded; fine.	ML		S	▼	0.50			SPT N = 9 Depth: 0.50m Type: Solid 60° cone 2, 4 / 3, 2, 2, 2 450mm penetration	Bentonite
							1.00				
							1.50				
							2.00			SPT N = 4 Depth: 2.00m Type: Solid 60° cone 4, 3 / 1, 1, 1, 1 450mm penetration	2.00
							2.50				Gravel
							3.00				
							3.50			SPT N = 5 Depth: 3.50m Type: Solid 60° cone 11, 5 / 2, 1, 1, 1 450mm penetration	
		Silty fine SAND with trace organic material; light bluish grey. 'Loose'; wet; poorly graded; organics, fibrous material.	SP		L		4.00				
		Sandy fine to coarse GRAVEL; dark greenish grey. Medium dense to dense; wet; well graded; subangular to subrounded; sand, fine to medium.	GW	W	D		4.50			SPT N = 34 Depth: 5.00m Type: Solid 60° cone 7, 8 / 7, 8, 10, 9 450mm penetration	
							5.00				
							5.50				
							6.00			SPT N = 29 Depth: 6.50m Type: Solid 60° cone 5, 7 / 8, 7, 8, 6 450mm penetration	
							6.50				
							7.00				
		Fine to medium SAND; dark bluish grey. Medium dense; wet; poorly graded.	SP		MD		7.50				
							8.00			SPT N = 0 Depth: 8.00m Type: Solid 60° cone 1, 0 / 0, 0, 0, 0 450mm penetration	8.00
		SILT with minor clay; light bluish grey. Very soft; wet; low plasticity.	ML		VS		8.50				Bentonite
							9.00				
							9.50			SPT N = 0 Depth: 9.50m Type: Solid 60° cone 1, 0 / 0, 0, 0, 0 450mm penetration	
	C/L	Coreloss					10.00				10.00
	C/L						10.50				
							11.00			SPT N = 30 Depth: 11.00m Type: Solid 60° cone 0, 1 / 2, 8, 10, 10 450mm penetration	
		Fine to medium SAND with some silt; dark bluish grey. Medium dense to dense; wet; poorly graded.			MD-D		11.50				
							12.00				
							12.50			SPT N = 17 Depth: 12.50m Type: Solid 60° cone 2, 2 / 4, 4, 4, 5 450mm penetration	Surrounding ground collapse
							13.00				
		Medium to coarse SAND; light yellowish brown. Dense; wet; poorly graded.	SP	W	D		13.50				
							14.00			SPT N = 31 Depth: 14.00m Type: Solid 60° cone 3, 2 / 5, 6, 9, 11 450mm penetration	
							14.50				
							15.00				
							15.50			SPT N = 40 Depth: 15.50m Type: Solid 60° cone 2, 2 / 7, 10, 12, 11 450mm penetration	

EOH: 15.95 m

Driller Pro-Drill	**Logger** LW	**Remarks** Coordinates and elevation are estimates only.
Drill Method / Rig HQ3		
Start Date 24/07/2012	**Checked By** LC	
End Date 24/07/2012		**Hole Depth** 15.95m

Borehole logged in accordance with NZGS guideline "Field description of soil and rock" 2005
Vane tests completed in accordance with NZGS guideline

19-D-02771

Golder Associates

METHOD OF SOIL DESCRIPTION USED IN BOREHOLE AND TEST PIT REPORTS


FILL


GRAVEL (GP or GW)


SAND (SP or SW)


SILT (ML or MH)


CLAY (CL, CI or CH)


ORGANIC SOILS (OL or OH or Pt)


COBBLES or BOULDERS

CLASSIFICATION AND INFERRED STRATIGRAPHY

Soil and Rock is classified and described in Reports of Boreholes and Test Pits using the descriptions given in NZGS 2005 Field Description of Soil and Rock. The material properties are assessed by visual/tactile methods.

PARTICLE SIZE – NZGS 2005

Major Division	Sub Division	Particle Size
BOULDERS		>200 mm
COBBLES		60 to 200 mm
GRAVEL	Coarse	20 to 60 mm
	Medium	6.0 to 20 mm
	Fine	2.0 to 6.0 mm
SAND	Coarse	0.6 to 2.0 mm
	Medium	0.2 to 0.6 mm
	Fine	0.06 to 0.2 mm
SILT		0.002 to 0.006 mm
CLAY		< 0.002 mm

MOISTURE CONDITION – NZGS 2005

Symbol	Term	Description
D	Dry	Sands and gravels are free flowing. Clays and silts may be brittle or friable and powdery.
M	Moist	Soils are darker than in the dry condition and may feel cool. Sands and gravels tend to cohere.
W	Wet	Soils exude free water. Sands and gravels tend to cohere.
S	Saturated	Feels cool, darkened in colour and free water is present on the sample.

CONSISTENCY AND DENSITY – NZGS 2005

Symbol	Term	Undrained Shear Strength
VS	Very Soft	< 12 kPa
S	Soft	12 to 25 kPa
F	Firm	25 to 50 kPa
St	Stiff	50 to 100 kPa
Vst	Very Stiff	100 to 200 kPa
H	Hard	> 200 kPa

Symbol	Term	Density Index %	SPT "N" Value (blows/300 mm)	Dynamic Cone (blows/300 mm)
VL	Very Loose	< 15	< 4	< 2
L	Loose	15 to 35	4 to 10	1 to 3
MD	Medium Dense	35 to 65	10 to 30	3 to 7
D	Dense	65 to 85	30 to 50	7 to 17
VD	Very Dense	> 85	> 50	> 17

In the absence of test results, consistency and density may be assessed from correlations with the observed behaviour of the material.
SPT "N-Values" are uncorrected.
No correlation is implied between Standard Penetration Test (SPT) and Dynamic Cone Penetrometer Test values.

19-D-02771

Golder Associates

EXPLANATION OF METHOD OF SOIL DESCRIPTION USED IN BOREHOLE AND TEST PIT REPORTS

DRILLING/EXCAVATION METHOD

AS*	Auger Screwing	RD	Rotary Blade or Drag Bit	NQ	Diamond Core – 47 mm
AD*	Auger Drilling	RT	Rotary Tricone bit	NMLC	Diamond Core – 52 mm
*V	V-Bit	RAB	Rotary Air Blast	HQ	Diamond Core – 63 mm
*T	TC-Bit, e.g. ADT	RC	Reverse Circulation	HMLC	Diamond Core – 63 mm
HA	Hand Auger	PT	Push Tube	BH	Tractor Mounted Backhoe
ADH	Hollow Auger	CT	Cable Tool Rig	EX	Tracked Hydraulic Excavator
DTC	Diatube Coring	NDD	Non-Destructive Digging	EE	Existing Excavation
WB	Washbore or Bailer	SON	Sonic Drilling	HAND	Excavated by Hand Methods

WATER

▼ Water level at date shown

GROUNDWATER NOT OBSERVED	The observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave in of the borehole/test pit
GROUNDWATER NOT ENCOUNTERED	The borehole/test pit was dry soon after excavation. However, groundwater could be present in less permeable strata. Inflow may have been observed had the borehole/test pit been left open for a longer period.

SAMPLING AND TESTING

SPT	Standard Penetration Test to NZS4402 Test 6.5.1:1998
2,3 / 3,4,4,4	2,3 / 3,4,4,4 = Blows per 75 mm.
N = 15	N = Blows per 300 mm penetration following 150 mm seating
30/60 mm	Where practical refusal occurs, the blows and penetration for that interval are reported
RW	Penetration occurred under rod weight only
HW	Penetration occurred under the hammer and rod weight only
HB	Hammer double bouncing on anvil
DS	Disturbed sample
BDS	Bulk disturbed sample
G	Gas sample
W	Water sample
FP	Field permeability test over section noted
FV	Field vane shear test expressed as uncorrected shear strength s_v = peak value, s_r = residual value
PID	Photoionisation Detector reading in ppm
PM	Pressuremeter test over section noted
PP	Pocket penetrometer test expressed as instrument reading in kPa
U50	Thin walled tube sample – number indicates nominal sample diameter in milimetres
WPT	Water pressure tests
DCP	Dynamic cone penetration test
CPT	Static cone penetration test
CPTu	Static cone penetration test with pore pressure (u) measurement

SAMPLING AND TESTING

TCR = Total Core Recovery (%)

$$= \frac{\text{Length of core recovered}}{\text{Length of core run}} \times 100$$

APPENDIX 7 : LABORATORY RESULTS AND COC

19-D-02771

Hill Laboratories
BETTER TESTING **BETTER RESULTS**

R J Hill Laboratories Limited
1 Clyde Street
Private Bag 3205
Hamilton 3240, New Zealand

Tel +64 7 858 2000
Fax +64 7 858 2001
Email mail@hill-labs.co.nz
Web www.hill-labs.co.nz

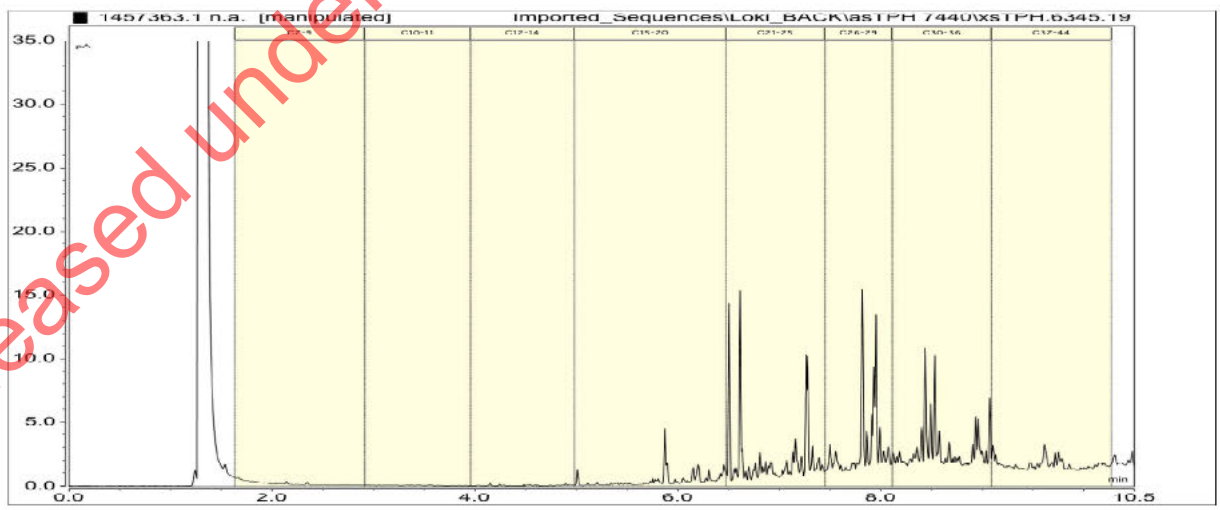
ANALYSIS REPORT

Client:	Cook Costello Limited	**Lab No:**	1457363	SPv1
Contact:	Melanie Thrush	**Date Registered:**	01-Aug-2015	
	C/- Cook Costello Limited	**Date Reported:**	13-Aug-2015	
	PO Box 9337	**Quote No:**		
	Tower Junction	**Order No:**		
	CHRISTCHURCH 8149	**Client Reference:**	12519	
		Submitted By:	Geocivil Limited	

Sample Type: Soil

		Sample Name:	s 9(2)(a) 0.5-1.0 31-Jul-2015 11:40 am	s 9(2)(a) 0.7-0.9 31-Jul-2015 11:50 am	s 9(2)(a) 0.75-1.0 31-Jul-2015 12:15 pm	s 9(2)(a) 0.85-1.0 31-Jul-2015 12:10 pm	
		Lab Number:	1457363.1	1457363.2	1457363.3	1457363.4	
Individual Tests							
Dry Matter	g/100g as rcvd		85	86	80	86	-
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn							
Total Recoverable Arsenic	mg/kg dry wt		52	45	8	24	-
Total Recoverable Cadmium	mg/kg dry wt		3.4	2.1	2.3	1.88	-
Total Recoverable Chromium	mg/kg dry wt		85	89	32	41	-
Total Recoverable Copper	mg/kg dry wt		1,080	2,400	150	750	-
Total Recoverable Lead	mg/kg dry wt		4,000	5,000	1,010	4,600	-
Total Recoverable Nickel	mg/kg dry wt		81	89	71	62	-
Total Recoverable Zinc	mg/kg dry wt		2,800	4,000	830	2,900	-
Total Petroleum Hydrocarbons in Soil							
C7 - C9	mg/kg dry wt		< 8	< 8	< 9	< 8	-
C10 - C14	mg/kg dry wt		< 20	< 20	< 20	22	-
C15 - C36	mg/kg dry wt		390	890	2,500	2,300	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt		390	890	2,500	2,400	-

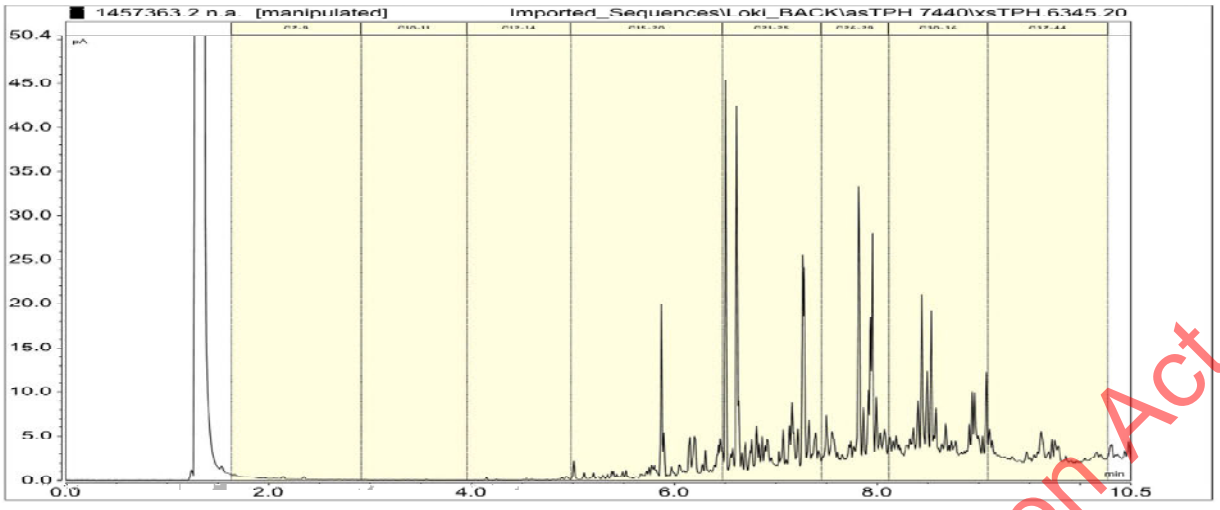
1457363.1
As 9(2)(a) 0.5-1.0 31-Jul-2015 11:40 am
Client Chromatogram for TPH by FID



1457363.2

B s 9(2)(a) 0.7-0.9 31-Jul-2015 11:50 am

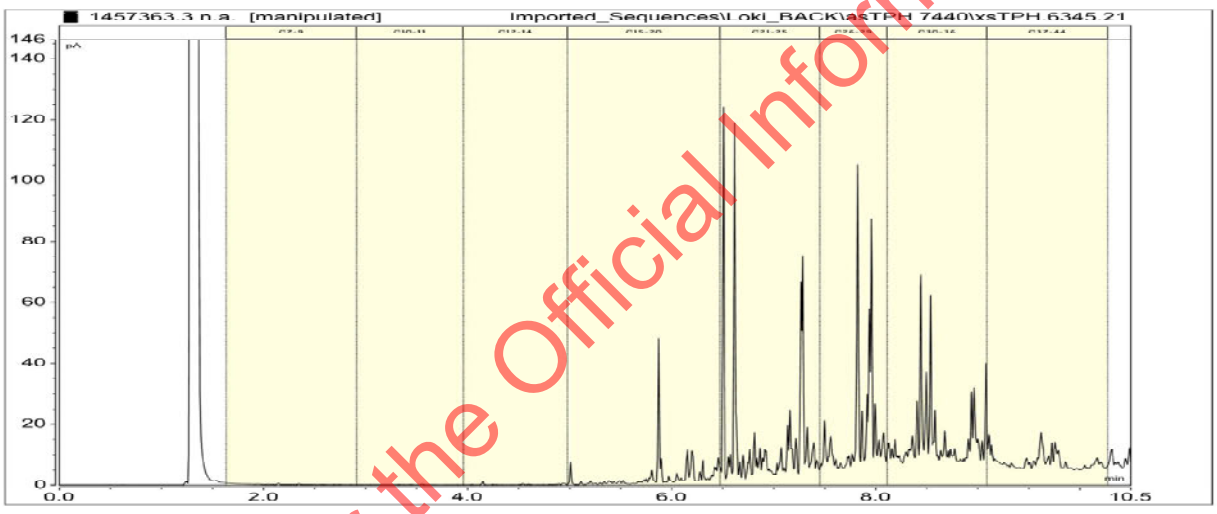
Client Chromatogram for TPH by FID



1457363.3

C s 9(2)(a) 0.75-1.0 31-Jul-2015 12:15 pm

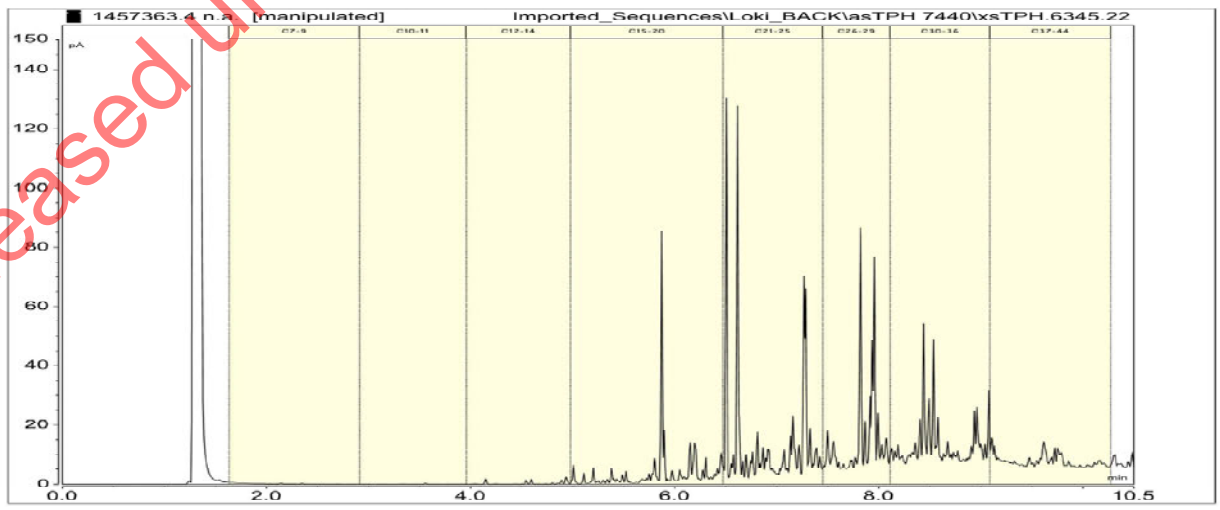
Client Chromatogram for TPH by FID



1457363.4

D s 9(2)(a) 0.85-1.0 31-Jul-2015 12:10 pm

Client Chromatogram for TPH by FID



SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-4
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.10 - 4 mg/kg dry wt	1-4
Total Petroleum Hydrocarbons in Soil*	Sonication extraction in DCM, Silica cleanup, GC-FID analysis US EPA 8015B/MfE Petroleum Industry Guidelines. Tested on as received sample [KBIs:5786,2805,10734]	8 - 60 mg/kg dry wt	1-4
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	1-4
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1-4

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

This report must not be reproduced, except in full, without the written consent of the signatory.

Carole Rodgers-Carroll BA, NZCS
Client Services Manager - Environmental Division

Project Management Plan

s 9(2)(a) Landfill

Phase 2 – Detailed Site Investigation

Date: 12 July 2017 V1.2

Document Control

Version Control

Version	Author	Description of Change	Date
0.1	Ministry for the Environment	Initial Document	07/07/2015
1.0	Environment Canterbury	Update document	30/06/2017
1.1	Ministry for the Environment	Update document	11/07/2017
1.2	Environment Canterbury	Update document	12/07/2017

Referenced Documents

Document Name	Date of Issue	Version
Environment Canterbury Scoping Study – s 9(2)(a) Results Tables and Maps	23/02/2017	1
Environment Canterbury Scoping Study – XRF labelled data	23/02/2017	1
CSRF Application, Environment Canterbury	31/03/2017	1
s 9(2)(a) List of Landowners	23/02/2017	1

Document Approval

Responsible for delivering the result

Signatory	Signature	Date
Davina McNickel **Team Leader, Contaminated Sites**		30/06/2017

Approved by: Project Sponsor

Signatory	Signature	Date
Stefanie Rixecker **Director, Science**		30/06/2017

Table of Contents

1. Introduction

1.1. Document Purpose

The purpose of this Project Plan (PP) document is to define the direction, scope and parameters of the s 9(2)(a) Landfill project and to detail the project management processes and activities which will direct the project during delivery. This PP will act as a base document against which the Project Steering Group and Project Manager can assess progress, project issues and the ongoing viability of the project throughout its lifecycle.

This PP covers the s 9(2)(a) Landfill project which consists of Phase 2: Detailed Site Investigation.

1.2. Background

The s 9(2)(a) Landfill site is located in the Christchurch suburb of s 9(2)(a), bounded by s 9(2)(a) to the east; s 9(2)(a) to the west; and s 9(2)(a) to the south. The land appears to have been filled around the early 1900's as the filling pre-dates houses that were built in the area in the 1940's. Key contaminants of concern are heavy metals and polycyclic aromatic hydrocarbons (PAHs). Lead, arsenic, chromium, copper, and zinc present well above expected background concentrations in surface soils and to depths up to at least 1.5 m below ground level. Lead contamination is the greatest concern, with concentrations at the site exceeding the residential soil contaminant standard of 210 ppm by a factor of up to 28 times.

The contamination was not discovered until after the 2010/2011 earthquakes when fill material was found during earthquake repair works for a number of houses in the area. The area was not identified in Environment Canterbury's records (Listed Land Use Register (LLUR) prior to receiving the reports. The LLUR details would not have been on any LIMs provided to residents by the Christchurch City Council when residents purchased their properties. All properties within the footprint of the site are residential properties with houses and gardens, the surrounding land is also used for residential purposes. The s 9(2)(a) are located around s 9(2)(a) to the s 9(2)(a) of the site respectively.

The site has been subject to a scoping study by Environment Canterbury, which included surface sampling using a portable XRF analyser. The study was undertaken to determine the lateral extent of the contamination. A number of properties have had detailed site investigations undertaken on them for insurance purposes. However, these were limited in scope and were largely for characterising the soil for disposal options, rather than assessing risks to human health. The lateral and vertical extent of the contamination at the site is not fully understood.

1.3. Project Management Plan Development Consultation

The Project Manager has developed the PP with a number of key stakeholders and interested parties. The PP has been agreed with the key stakeholders and was agreed approved by the Project Steering Group.

Below is the list of parties, who have been involved in PP development consultation.

Party	Comments (if any)
Ministry for the Environment (MfE)	Funder
Environment Canterbury	Project Management
Christchurch City Council	Financial Contribution

Landowners	Affected parties
Canterbury District Health Board	Interested Party
Consultant	Undertake detailed site investigation

2. Project Definition

2.1. Project Objectives

This s 9(2)(a) Landfill project has the following primary objectives:

Detailed Site Investigation, Phase 2 objectives:

1. The assessment of the s 9(2)(a) Landfill is undertaken in manner that minimises any risk from the contaminants present to site workers and owner/occupiers.
2. Determine the lateral and vertical extent of the s 9(2)(a) Landfill and characterise the contaminants within the fill materials.
3. Quantify the risk presented to human health and the environment from contamination associated with the historical landfilling activities.
4. Provide landowners and property occupants with information on the extent and severity of the contamination at their property.

2.2. Scope

The following assumptions were made in respect to the project's scope:

- It is assumed that the project will be completed within the funding made available for the project
- It is assumed that the project will be completed within the timeframes as set out in Section 6 of this document entitled *"Project Schedule"*
- Further applications to the fund will be made if future stages of works at the site are required.

Project Lifecycle Stages

The project stages are as follows:

The following tables outline project in-scope and out-of-scope activities.

In Scope Items
s 9(2)(a) **Landfill, Phase 2** • Milestone 1: The completion of a Detailed Site Investigation by a specialist contractor DSI report. o Development of a conceptual site model o Sampling plan o Fieldwork o Laboratory analysis and reporting o Preliminary identification and indicative assessment of remedial options

Out of Scope
The following are excluded from the scope of works

Out of Scope
Phase 2 • Full detailed assessment of remedial options. Due to the complexities of the site with approximately 23 landowners, a future CSRF application will be made for a full assessment of remedial options if required. • Remediation of any contaminated land. • Assessment of any environmental effects on nearby watercourses

2.3. Key Performance Indicators (KPIs)

Phase 2 KPIs

1. The Detailed Site Investigation will be undertaken in accordance with the Project Health and Safety Plan.
2. Completion of a Detailed Site Investigation as per the timings of the project schedule (30/11/2017). This will be measured by:
    - Development of a specific health and safety plan for the detailed site investigation that identifies specific hazards and appropriate mitigations and is consistent with the Environment Canterbury health and safety plan by 15/09/2017. Risk register is kept up to date throughout the project.
    - The completion of a DSI report (including a conceptual site model, sampling plan, fieldwork, laboratory analysis, and indicative assessment of remedial options) in accordance with the MfE Contaminated Land Management Guidelines 1-5 (CLMG 1-5). The DSI report will identify the lateral and vertical extent of the contamination, risks to human and environmental receptors, and assess the requirement for further investigation/remediation to address the risks identified by 30/11/2017.
    - The Detailed Site Investigation will be completed within forecasted budget (s 9(2)(b)(ii))
3. The DSI report will compare contaminant results to applicable soil contaminant standards and guidelines by 30/11/2017.
4. Landowners are provided with a report detailing the results for their individual property by 15/12/2017 which is presented in a form that allows landowners to easily understand the findings and make them aware of extent and nature of the contamination and the potential exposure risks of the site. If relevant, the findings of the report should be shared with property occupants.

2.4. Expected Project Benefits

The project has identified a number of potential benefits to be achieved post project implementation. The table below outlines these benefits.

The key benefits of the project are based on:

Benefit Type	Benefit Description	Measure	Source of measure
Social/Cultural	Enhanced relationship between Christchurch City Council and Environment Canterbury	Joint approach to communications and liaison with community	Works and report satisfies both Environment Canterbury and

Benefit Type	Benefit Description	Measure	Source of measure
		throughout the project	Christchurch City Council requirements
Environmental/Human Health	The occupants of the houses, and any future occupants, will be aware of the status of the soil at their property	DSI report is provided to landowners and local authorities	Local authority records will retain information and reports of works completed
Environmental/Human Health	The investigation will inform the management or remediation of the landfill	The DSI report is robust and will inform future stages of work	Report satisfies both Environment Canterbury and MfE requirements

2.5. Quality Assurance Processes

The table below identifies key Quality Assurance processes for the project and the methods by which success will be measured. These are the components the project needs to satisfy in order to be considered successful by its key stakeholders and end customers.

Critical Success Factor	Acceptance criteria	Date due	Responsible person
DSI meets CLMG 1-5 requirements	A suitably experienced and reputable consultant is engaged to undertake the DSI. The report is consistent with Contaminated Land Management Guidelines No's 1 & 5.	01/09/2017	Conor Parker
The cash cost of the project does not exceed $ s 9(2)(b)(ii)	The project is managed in a way that ensures it is kept on budget	30/11/2017	Conor Parker
DSI report is submitted in accordance with the project schedule	All site works are completed and report is submitted to Environment Canterbury by 30/11/2017	30/11/2017	Conor Parker

2.6. Key Stakeholders

Stakeholders are defined as affected or interested parties. The following groups have been identified as the key stakeholders for the project.

Stakeholder	Description/roles	Engagement Strategy
Landowners/property occupants	The landowners were unaware of the contamination in the soil when they bought their properties. Partnership will strengthen with Environment Canterbury and Christchurch City Council as works are undertaken to assess the extent and severity of the contamination.	The landowners and property occupants will be involved throughout the process. Individual property results will be shared with the relevant landowners
Christchurch City Council	Partnership will be strengthened with Environment	Sharing of final report

	Canterbury as the two bodies communicate and cooperate with each other on the project. Christchurch City Council will contribute $s 9(2)(b)(ii) towards this phase of the project.	and briefing to key CCC staff at the conclusion of the project.
Environment Canterbury	Environment Canterbury has performed an initial scoping study of the area. Partnership will be strengthened with the Christchurch City Council and the wider community as Environment Canterbury demonstrates its ability to be proactive and supportive in contentious contaminated land situations. Environment Canterbury will contribute $s 9(2)(b)(ii) towards this phase of the project.	Environment Canterbury is the project manager so responsible for all aspects of the project implementation.
Canterbury District Health Board	The Canterbury District Health Board have been involved in initial conversations and meetings with landowners, and have provided advice relating to the health implications on living on contaminated soil. Further advice will be sought following the completion of the detailed site investigation. Partnership will be strengthened as Environment Canterbury and the Canterbury District Health Board communicate and cooperate with each other on the project.	Sharing of final report and briefing to key CDHB staff at the conclusion of the project.
Ministry for the Environment	Active Monitoring Funding up to $s 9(2)(b)(ii)	Reporting, Milestone claims.

2.7. Key Messages

Outline the key messages that the project needs all stakeholders and audiences to understand. There should be no more than three to five.

The key messages for this project are:

- The s 9(2)(a) Landfill in s 9(2)(a), Christchurch was subject to landfilling in the 1900s. The source of the fill is unknown, but initial investigations have found concentrations of lead, arsenic, chromium, copper, zinc, and asbestos that exceed residential soil guideline values for the protection of human health.
- The landowners were unaware of the contamination in the soil when they bought their properties. The landfill only came to the attention of Environment Canterbury following the submission of detailed site investigations for earthquake repair works in 2015.
- Environment Canterbury has commissioned a detailed site investigation (DSI) to be undertaken by a suitably qualified and experienced practitioner. The purpose of the DSI is to determine the lateral and vertical extent of the Hawford Road Landfill and characterise any contamination within the fill materials.
- The DSI report will detail the extent and severity of the contamination at the site, which will assist with the assessment of health risks and the development of remedial options.
- Currently landowners have been advised on measures they can take to reduce their exposure.

2.8. Risk Assessment and Management

The management of the risk associated with this project is an essential element of the overall success. If risks are not identified and managed appropriately, time and financial costs may

increase and at worst, result in damage to property and people. This will have a direct impact on the project and may also have an impact on perceptions of the project's stakeholders.

The process for continuous identification, communication and management of risks throughout the project life is as follows:

a. The identification and assessment of project risks by project manager and the appointed consultant
b. Creation of a Project Safety Plan prior to site works by the Project Manager and checked by the Environment Canterbury Health and Safety Advisor and Project Executive.
c. Daily site assessments by consultants prior to works
d. Erosion, sediment and dust controls
e. Appropriate Personal Protective Equipment, signage and fencing
f. Maintenance of a Project Risk and Issues Register/s
g. Regular communication with the landowner/property occupants, Environment Canterbury, Christchurch City Council, and Ministry for the Environment.

Risks Reporting and Escalation

The Project Manager will be responsible for risk recording, reporting and escalation processes in accordance with the Council's overall risk management framework.

The initial project risk are recorded in the Risk Register attached as Appendix 1. The Risk Register is a living document and the latest updates can be obtained from the Project Manager or found in Environment Canterbury's Records Manager under s 9(2)(a). The Risk Register will be reviewed at regular intervals/project meetings by the Project Team to ensure that risk are being monitored and managed.

2.9. Issues Management

The Project Manager will be accountable for the management of issues with the appropriate owners across the project and stakeholder groups. An issues register will be maintained by the project manager.

Prompt identification and resolution of project issues is a key to successful project delivery. All issues identified by the project team or other stakeholders will be recorded in the Issues Register. The following details for all issues identified will be included:

- issue No.
- full description
- issue rating and priority (H/M/L)
- impact of the issue
- resolution actions required
- resolution date
- status

The project manager will assign an owner for each issue. The owner of the issue must have the appropriate resource and fiscal delegations to be able to implement any actions required to address the issue.

During the course of the Project it is likely that a number of identified risks will materialise and planned mitigation, transfer or acceptance activities will be put in place. Any risks that have materialised will be tracked by the project as an issue.

3. Project Milestones

The Project Manager is responsible for monitoring the project's progress against its detailed schedule.

The table below outlines the high level planned completion dates for each phase of the project. The Project Manager will direct and co-ordinate the individual tasks within the scope of the project ensuring that agreed milestones are met.

[Detailed Site Investigation, Phase 2]

Milestone	Deliverable Items to be provided to MfE to support milestone claims	Original Timing	Actual Timing (if changed)	Resources /costs	CSRF funding	Responsible person
1. Detailed Site Investigation		**From 15/09/2017 to 16/02/2018**		s 9(2)(b)(ii)	s 9(2)(b)(ii)	**Project Manager (Conor Parker)**
1.1 Confirmation of landowner approval	Copies of the signed letter from all landowners	22/09/2017				
1.2 Development of Conceptual Site Model	Initial conceptual site model in accordance with CLMG1 to be reviewed by Environment Canterbury and provided to MfE	22/09/2017		s 9(2)(b)(ii) *	s 9(2)(b)(ii)	Conor Parker
1.3 Sampling Plan	Site sampling plan to be completed in accordance with CLMG1 to be provided to Environment Canterbury for review	22/09/2017		s 9(2)(b)(ii)	*	Conor Parker
1.4 Fieldwork	Collection of samples from fieldwork to be completed in accordance with CLMG5 as evidenced by trial pit/borehole logs	From 22/09/2017 to 30/11/2017		s 9(2)(b)(ii)		Conor Parker
1.5 Laboratory Analysis	Laboratory analytical testing - Copies of chain of custody forms and laboratory analytical reports	From 22/09/2017 to 30/11/2017		s 9(2)(b)(ii)		Conor Parker
1.6 Reporting	Final Report: Detailed Site Investigation – to include the results of sampling, comparison with guideline values/standards; updated conceptual site model and conclusions, an indicative assessment of remedial options, plus recommendations for further works. Report to be completed in accordance with CLMG1	22/12/2017		s 9(2)(b)(ii)		Conor Parker
Milestone claim	Milestone claim form and supporting documents	**16/021/2018**		s 9(2)(b)(ii)		**Conor Parker**
Estimated total cash cost for Phase 2				s 9(2)(b)(ii)		

* All costs are estimates and will be updated when a consultant is selected to undertake the Detailed Site Investigation.

3.1. Expected costs

Expected costs are outlined in the table below:

Description	In-kind	Cash
Detailed Site Investigation – Phase 2		
Environment Canterbury	s 9(2)(b)(ii)	
Christchurch City Council		s 9(2)(b)(ii)
CSRF - funding approved up to		s 9(2)(b)(ii)
Total Detailed Site Investigation Phase 2 project cost		s 9(2)(b)(ii)
Total CSRF contribution for Phase 2 up to		s 9(2)(b)(ii)

*Based on Environment Canterbury's charge out rate of $s 9(2)(b)(ii) per hour

3.2. Dependencies and assumptions

The project has identified key dependencies which have the potential to impact project delivery. Dependencies are documented in the table below.

Dependency	How this will be managed	Person responsible for monitoring
The area to be investigated will be limited to those where Landowner and property occupants' cooperation has been agreed.	Keep landowners and occupants up to date with works and reporting schedule	Conor Parker
Consultants will be available in a high demand, rebuild economy	Early engagement of consultants, Timelines and budgets for works identified before works commence	Conor Parker
The weather will be amenable to site works	Field task timelines will be overestimated to allow for unforeseen delays.	Conor Parker

3.3. Constraints

The project has identified the following constraints which need to be considered by the project and which may impact on the project's ability to deliver against its planned timeframes.

- Consultant access to site. Access to individual properties is dependent on agreement with the landowner/property occupiers. Environment Canterbury will consult with landowners and property occupiers prior to appointing a consultant, to ensure that access is available when a consultant is appointed.
- Access to all areas of the site is limited. Access may be restricted in certain areas due to buildings covering the soil, or due to health and safety issues involved in accessing land. The sampling plan will investigate options to ensure the sampling undertaken appropriately represents the site's exposure area.
- Accidental discovery of unknown contamination presents an unacceptable risk for future works to be undertaken until mitigated or removed. An unexpected discovery protocol is to

be developed prior to commencement of physical works to ensure that the project can continue with minimal delays and cost impacts.

3.4. Project Change Management

Changes will be required to follow the change management process. All variations to the deed will be arranged by Environment Canterbury with the Ministry in accordance with the Deed of Funding. Changes must be advised by the Project Manager.

Any changes that are affecting the work programme budget or timeline agreed in the deed must have to be communicated to the Ministry along with the Request for Variation Form (to be obtained from the Ministry). Request for Variation Form shall be approved by Environment Canterbury's Project Sponsor before being submitted to the Ministry.

3.5. Project Reporting

Project reporting is set at different levels. These are as follows:

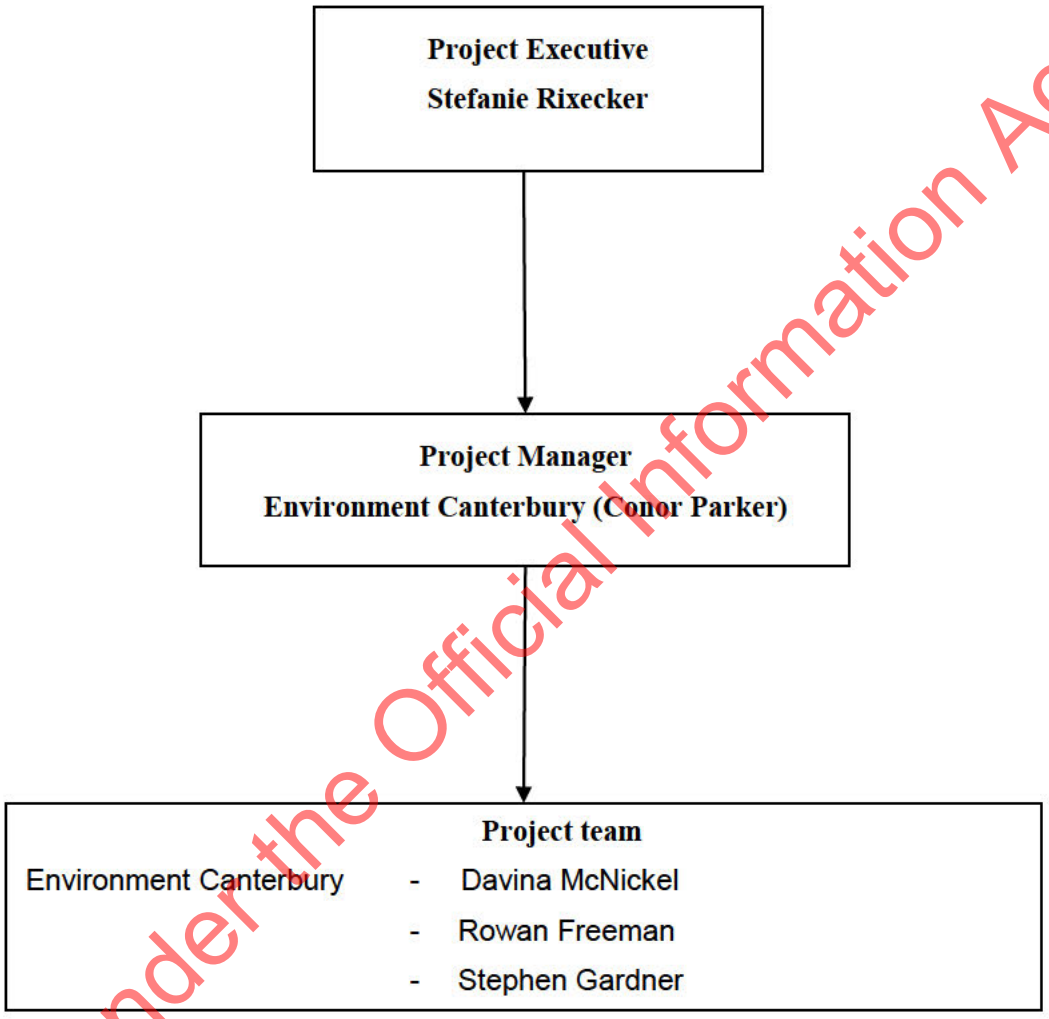
Target audience	Type of reporting	Purpose	Timing
Consultants, project Advisors, Landowners/ Property occupants/MfE	Project Management Plan	Clarification of project purpose, roles and responsibilities	Approved document by 01 August 2017
Consultants/ Landowners/ Property occupants/MfE	Confirmation of engagement of consultant	Report on progress in engaging a consultant, and likely timeframe for investigation works	01 – 15 September 2017
MfE	Status Communication	To provide regular updates to the MfE regarding work under the CSRF deed.	Weekly progress email of meeting minutes/memo's, regarding timing/budget, and when required for any important events.
Landowners/ Property occupants	Technical reports	To provide detailed site investigation report and recommendations for future work	01 – 15 December 2017
Territorial Authorities and MfE	Technical reports	To provide detailed site investigation report and recommendations for future work	01 – 15 December 2017
MfE	Project Closure Report	Report on the success of the project when considering all milestone deliverables, evaluation of the project objectives, identify any lessons learnt.	By 31 January 2018

Other reports might include risks, issues, change requests, or specific reports as directed by the Project Sponsor.

4. Project Organisation & Structure

4.1. Project Structure

To ensure strong governance and project control the following structure has been put in place for the project.



It is the responsibility of the Project Manager to keep the Project Executive informed. A weekly meeting regarding health and safety, timeframes and budget will be held with the Contaminated Sites Team Leader and minutes will be kept. These minutes will be provided to the Project Executive and the Ministry for the Environment.

4.2. Project Team

The project is managed overall by the Project Manager.

The table below summarises the project team roles and the key responsibilities.

Role	Who	Key Responsibility
Project Manager	Conor Parker	Project planning, contractor tendering, report preparation, liaison with MfE and landowners

Project Executive	Stefanie Rixecker	Assume responsibility for delivery of the benefits and success of the project.
Project team members	Davina McNickel Rowan Freeman Stephen Gardner	Assist with project planning, contractor tendering, report preparation, liaison with MfE and landowners
Consultant	Consultant to be arranged	Preparation of DSI

5. Evaluation

Project Evaluation is a step-by-step process of collecting, recording and organizing information about project results, including short-term outputs (immediate results of activities, or project deliverables), and immediate and longer-term project outcomes (changes in behaviour, practice or policy resulting from the project).

5.1. Evaluation of milestone

The table will help to evaluate and measure the successful implementation of each milestone

Evaluation of milestones		
Milestone 1 – Detailed site investigation	**Measure**	**Source of measure**
1.1 Development of Conceptual Site Model	*An initial Conceptual Site Model acceptable to Environment Canterbury officers*	*A Conceptual Site Model developed in accordance with CLMG 1 & 5 to be provided to Environment Canterbury prior to DSI works commencement*
1.2 Sampling plan	*A Sampling Plan to be approved by Environment Canterbury*	*Completion of a DSI sampling plan developed in accordance with CLMG 1 & 5 and is provided to Environment Canterbury*
1.3 Fieldwork	*A walk over survey of the site to identify sampling locations* *Sampling in accordance with the approved sampling plan*	*Evidence of field notes and photographs from site works to be included in the DSI report* *Chain of custody forms to be included in the DSI report*
1.4 Laboratory analysis	*Laboratory analysis provides accurate results that reflect the actual concentrations of contaminants in the soil at the site*	*Laboratory analysis to be undertaken by an IANZ accredited laboratory. Laboratory reports provided in DSI report. Provision of laboratory analysis in Milestone Report*
1.5 Reporting	*Report completed in accordance with CLMG 1 and accepted by Environment Canterbury and MfE.*	*A detailed site investigation report prepared in accordance with CLMG 1.* *The report details the following:* • *Updated conceptual site model* • *Sampling plan including locations and methodologies* • *Location, extent and concentration of any contaminants that may present a risk to site occupants and future landowners* • *Appropriate contaminant standards* • *Assessment of any potential risk to*

Evaluation of milestones		
		landowners/site occupants *The report is to include indicative recommendations for any remedial works that would be required to ensure that the land is suitable for ongoing residential use*

5.2. Evaluation of project objectives

Evaluation of project objectives will help to determine whether the objectives and the benefits of the project have been met.

Complete the table below. Each of the "SMART" objectives listed in the section 2.1 Project Objectives must have a corresponding row in the table.

Evaluation of project objectives			
Objective	**Key performance indicator (KPI)**	**Source of measure**	**Baseline information**
1. *The assessment of the* s 9(2)(a) *Landfill is undertaken in manner that minimises any risk from the contaminants present to site workers and owner/occupiers.*	*All works undertaken in accordance with the site health and safety plan.*	*Health and safety items recorded in meeting minutes and project reports. Health and safety audits, corrective actions identified. Accidents register.*	*Project health and safety plan*
2. *Determine the lateral and vertical extent of the* s 9(2)(a) *Landfill and characterise the contaminants within the fill materials.*	*The completion of a DSI report (including a conceptual site model, sampling plan, fieldwork, laboratory analysis, and indicative assessment of remedial options) in accordance with the MfE Contaminated Land Management Guidelines 1-5 (CLMG 1-5). The DSI report will identify the lateral and vertical extent of the contamination, risks to human and environmental receptors, and assess the requirement for further investigation/remediation to address the risks identified.* *Detailed Site Investigation will be completed within forecasted budget*	*The DSI and report to be completed in accordance with CLMG 1&5 to assess the risk to human health and environmental receptors and to identify the need for further investigation/remediation.* *Milestone claim form to be submitted to MfE on completion of milestones.* *Site Closure Report completed by (30/11/2017)*	*Limited detailed site investigations have been completed for individual properties. An Environment Canterbury scoping study identified surface contamination above residential soil contaminant standards at the site.*

Evaluation of project objectives			
	s 9(2)(b)(ii)		
3. *Quantify the risk presented to human health and the environment from contamination associated with the historical landfilling activities.*	*The DSI report will compare contaminant results to applicable soil contaminant standards and guidelines by 30/11/2017.*	*The DSI and report to be completed in accordance with CLMG 1&5 to assess the risk to human health and environmental receptors and to identify the need for further investigation/remediation.*	*Limited detailed site investigations have been completed for individual properties. An Environment Canterbury scoping study identified surface contamination above residential soil contaminant standards at the site.*
4. *Provide landowners and property occupants with information on the extent and severity of the contamination at their property.*	*Landowners are provided with a report detailing the results for their individual property by 15/12/2017.*	*Individual reports are provided to landowners and property occupants detailing the results for their individual property.*	*Landowners have been provided with preliminary reports and community meetings have been held outlining their soil results and the CSRF process.*

6. Project Schedule

For a full scale project, the project schedule will typically be a Microsoft Project Plan, and normally displayed as a Gantt chart. The project schedule will be reviewed at the beginning and end of each of the project phases.

01/07/2017 – 01/08/2017	Project Management Plan Approval
01/08/2017 – 01/09/2017	Tender for consultants
01/09/2017 – 15/09/2017	Engage consultant
15/09/2017 – 15/11/2017	Undertake DSI works
30/11/2017	DSI Report due
31/01/2018	Closure report to MfE

Appendix 1: Risk Assessment Register

This is a live document and will be held separately to the Project Management Plan in the Project Health and Safety Plan that will be developed with the consultant.

Risk No.	Potential risk	Level of risk	Impact on project	Consequence on project	Strategy to mitigate
1	A Health and Safety incident occurs during investigation works injuring or harming people	Low	Project delayed as incident is attended to, potential for long delay if the incident is serious	Project is delayed while Worksafe investigation is undertaken	Health and safety plan created by consultant. Monitoring and auditing according to the health and safety plan
2	Property or services damage from works	Low	Financial loss due to damage and associated repair works. Loss of faith in Environment Canterbury from site owners	Project is delayed while repairs are made. Increased monetary cost	Ensure consultant follows the provisions in the Health and Safety Plan, and works are discussed with the landowner prior to investigations starting
3	Change in project parameters/consultants	Low	Project is delayed while new parameters are accommodated/consultants sourced. Increased monetary cost	Project delays while sourcing replacement consultant	Contracts from chosen consultant
4	Lack of community/landowner engagement and cooperation	Low	Project is delayed while access is negotiated. Some properties are unable to be sampled	A full lateral and vertical assessment of the landfill is unable to be completed	Engage landowners before consultant is appointed to ensure access is available
5	Negative media coverage of the project	Medium	Loss of faith in Environment Canterbury and Christchurch City Council from homeowners	Project may be delayed, a full lateral and vertical assessment of the landfill is unable to be completed	Create a communications plan for media and homeowner enquiries.

Ministry for the Environment
Manatū Mō Te Taiao

Contaminated Sites Remediation Fund

Application Form (Part 1)

Application Overview:	
Council name	Environment Canterbury
Site Name	s 9(2)(a) andfill – s 9(2)(a)
Project name	s 9(2)(a) – s 9(2)(a)
CSRF Phase *(Delete non-applicable phases as required)*	Phase 4 – Remediation
Total cost of project	s 9(2)(b)(ii)
Amount requested from CSRF	s 9(2)(b)(ii)
Estimated Duration of project	1 year

Official information and privacy

Official Information Act 1982

Important: Information presented to the Minister for the Environment or the Ministry for the Environment is subject to disclosure under the Official Information Act 1982 (OIA). Certain information may be withheld in accordance with the grounds for withholding information under the OIA. Further information on the OIA is available at www.ombudsmen.parliament.nz.

Information held by the Minister or Ministry may have to be released under the OIA in response to a request from a member of the public (or any other body) for that information. If you wish to provide sensitive information to the Minister or Ministry which you do not want released, it is recommended you consult with the Ministry as to whether the information is necessary for the application, and whether there may be grounds in the OIA for withholding the information. For instance, if release of the information would disclose a trade secret, or be likely to unreasonably prejudice the commercial position of the person who supplied or who is the subject of the information, then there may be grounds to withhold the information. If an OIA request relating to your application is received, the Ministry will endeavour to contact you to discuss it, and what the implications of releasing your information are.

The grounds for withholding information must always be balanced against consideration of public interest that may justify release. Although the Ministry does not give any guarantees as to whether information can be withheld under the OIA, it may be helpful to discuss OIA issues with the Ministry in advance if information provided with an application is sensitive.

Privacy Act 1993

Important: The Ministry for the Environment Environment House, 23 Kate Sheppard Place, Wellington 6011 may collect, use, hold or disclose personal information for the purpose of assessing eligibility and suitability for Contaminated Sites Remediation Fund funding. Individuals have the right in accordance with the Privacy Act 1993 to request access to and correction of their personal information. While the provision of personal information is not mandatory, failure to provide requested information could lead to a delay in considering the application or a decline of the same.

Introduction

This application form is for project proposals to the Contaminated Sites Remediation Fund. We strongly recommend that you read the *Contaminated Sites Remediation Fund Guide for Applicants 2018* before completing this application form.

Important information

- To improve your chance of success, refer to the *Contaminated Sites Remediation Fund Guide for Applicants 2018* before completing this form.
- There are two parts to the application form – both must be completed:
  - Part 1 : Project proposal and governance (in Word) [this document]
  - Part 2 : Estimated Project budget *(in Excel)*

  You must fill out both parts as incomplete applications will not be assessed.
- You can move between boxes in this form by using the mouse, pressing the ↑ and ↓ keys on your keyboard, or using the Tab key. Use text only; do not enter images, tables or graphs into the form.
- Complete all questions and the checklist. If a question does not apply to your project, please use 'N/A' or 'none' instead of leaving the reply blank.
- Follow the word limits for those parts that have them. To check the number of words, highlight the text and use Word Count on the Review toolbar.
- We are unable to accept applications which are late or incomplete. An application will not be considered if:
  - the designated application form (Part 1 and Part 2) is not used or the template form has been altered in any way
  - the application form (Part 1) is not electronically signed
  - the 'Balance of Funds (C)' in application form (Part 2) is showing a negative figure
  - the required supporting documentation has not been attached
  - all of the required information is not submitted as one email
  - it is received after the closing date, or received after the closing time on the closing date.
- Note that Contaminated Site Remediation Fund grant payments can only be paid ***after*** funding is approved and a deed of funding has been signed by both contracting parties. Funds are not available for activities which occur before the deed is signed.

If you need help to complete the application form, refer to the *Contaminated Sites Remediation Fund Guide for Applicants 2018* in the first instance. For any further information, email CSRFapplication@mfe.govt.nz.

When your application is complete

The deadline for completed application forms to be received by the Ministry is the last working day of March (Round 1) or September (Round 2), depending on the funding round. We are unable to accept late applications. We are also unable to assess incomplete applications, so it is important you provide all the required information.

Email your completed application form and supporting documentation (as required) to CSRFapplication@mfe.govt.nz (with 'CSRF application' and your organisation name in the subject line). We will only accept **one email per application** – documents submitted as multiple emails will not be accepted. There is a checklist for your use on the last page of this application form.

Once you have emailed your application, you should receive a reply to acknowledge that your application has been received. If you have not received a reply within one working day please call us to let us know. Rarely emails can be blocked without notification to either party and we do not want to miss your application.

Eligibility criteria

Applications to the Contaminated Sites Remediation Fund must be able to answer 'yes' to each of the eligibility criteria below. The following self-assessment checklist is based on the fund criteria. If you cannot meet these criteria, you are not eligible to apply to the Contaminated Sites Remediation Fund.

Note that meeting the eligibility criteria does not guarantee that your project will be funded. If you have any queries about the eligibility criteria please, email CSRF@mfe.govt.nz.

Contaminated sites that are on Crown land, where Crown has accepted responsibility for the contamination, are not eligible for the CSRF.

Self-assessment checklist

	Does your project meet the following criteria?		Yes / No
1	The application (Part 1 and Part 2) is complete and all supporting information has been provided.		Yes
2	Did site contamination occur **before** the RMA (1991)? *(if **NO**, move to question 3)*		Yes
3	Did site contamination occur **after** the RMA (1991) was enacted, but no enforcement action could be undertaken by regional councils, unitary authorities, or territorial authorities to investigate and/or remediate the contamination **AND** the activities that caused the contamination have since stopped?		No
4	Has the appropriate site investigation(s) been undertaken for the project phase that is being applied for? *Note: reports must be completed in accordance with Contaminated Land Management Guidelines 1 and/or 5 and attached as supporting information to this application.*		Yes
5	The funding application is for one (or more) of the following phases of work:		
	Phase	*Required supporting evidence:*	*Select all that apply:*
	Phase 2 – Detailed Site Investigation	*Preliminary Site Investigation*	☐
	Phase 3 – Remedial Planning	*Above, plus Detailed Site Investigation*	☐
	Phase 4 – Site Remediation	*Above, plus Assessment of Remedial Options and Remedial Action Plan.*	☒
6	Funding is only requested for the years in which the site investigation, remedial planning, and/or site remediation will be undertaken.		Yes
7	The applicant is a regional council or unitary authority.		Yes

Assessment criteria

Projects are measured against assessment criteria. The assessment panel reviews, scores and assesses applications that meet the eligibility criteria by determining the extent to which and how well the project demonstrates it meets the assessment criteria.

Some projects may be recommended for funding without conditions. Some projects may be recommended for funding for less than the requested amount, and/or with specific conditions of funding attached.

Assessment criteria		
1	Partnerships	Is there a demonstrated partnership between the regional council and other interested parties?
2	Human Health and Environmental Risks	Does the site pose (or potentially pose) significant risk to human health or to the environment? *Note this should be demonstrated through the supporting documents.*
3	Project Management	Has the project manager and/or regional council: • Demonstrated their project management expertise using best practice project management methodologies and tools • Established appropriate project management structures • Demonstrated capability to undertake the project (including the practicality and feasibility of the proposed actions)?
4	Priority	Does the site hold a ranking on the CSRF Priority List?
5	Responsibility	Does funding reflect the responsibility for the contamination? Does the landowner/occupier's contribution towards the project costs reflect their degree of responsibility for contaminating the site (fully or partially)?
6	External Funding	Do contributions from other parties reflect on their ability and/or willingness to contribute to the project?

SECTION A: Applicant details

See pages 13 and 14 of the Guide for Applicants 2018 for information on how to complete this section.

1. Regional Council details

Regional Council legal name	Canterbury Regional Council
Trading name (if different)	Environment Canterbury
Physical address *Include post code.*	200 Tuam Street Christchurch Central Christchurch 8011
Postal address *Include post code.*	PO Box 345 Christchurch 8140
Telephone	03 365 3828
Website address	ecan.govt.nz

2. Contact details for this application

Primary contact name	Conor Parker	Secondary contact name	Graham Aveyard
Organisation	Environment Canterbury	Organisation	Environment Canterbury
Role or job title	Senior Scientist	Role or job title	Science Team Leader – Contaminated Environmental Science and Hazards
Phone	03 365 3828 *Landline* s 9(2)(a) *Mobile*	Phone	03 365 3828 *Landline* s 9(2)(a) *Mobile*
Email address	conor.parker@ecan.govt.nz	Email address	graham.aveyard@ecan.govt.nz
Physical address *If different to above*	N/A	Physical address *If different to above*	N/A

SECTION B: Site details

See pages 15 and 16 of the Guide for Applicants 2018 for information on how to complete this section.

The following two sections should be high-level overviews, approximately 100 words per item, with detailed information provided through the supporting information (such as a Preliminary Site Investigation) attached with this application.

3. Details of your site

Site Name *What is the site commonly referred to as?*	s 9(2)(a)
CSRF Priority List Ranking *See: CSRF Priority List; or N/A if not listed.*	1
Has an application to the CSRF for this site been lodged previously? *If yes, provide the year and funding round. If funding was granted, provide the Deed Number.*	Yes 2017 Round 1 Deed number 22136
If contamination occurred ***after*** the RMA (1991) was enacted, has enforcement action been taken by the council? If yes, please provided details on what action was taken and the outcome. If no, provide details on why no enforcement action was taken.	N/A
Have the HAIL activities that caused the contamination ceased? If so, when?	X Yes ☐ No *If yes, provide details:* Filling of the site with waste material ceased prior to construction of homes in the late 1930's.
Will all, or part, of the site be sold following site works *Note: Sale of the site will trigger the Betterment Return term in the deed of funding.*	☐ Yes X No *If yes, provide details:*
What is the proposed use of the site following remediation?	Residential

Supporting information: It is a requirement to provide as supporting information to this application the most relevant site investigations correlating to the CSRF project phase you are applying for. Any supporting site investigation or remedial plan must have been completed in accordance with Contaminated Land Management Guidelines 1 and/or 5. If you do not submit the relevant supporting information, your application will not be assessed for funding. Refer to page 22 of the *Guide for Applicants 2018* for further information.

4. Site and Landowner Details

Complete the following table. If the landowner and site occupier for one piece of land are different, use two rows and 'as above' where information is doubled up such as the address and legal description.

See page 27 of the Guide for Applicants 2018 for information on how to complete this question.

Address	**Legal Description**	**Landowner/ Occupier's Legal Name** *Include trading name, if different*	**Contact Person**	**Phone number & Email**	**Relationship to site** *Landowner, occupier, other (please specify)*	**What year was the site purchased?**	**Was the landowner aware of the contamination when the site was purchased?** *(Y/N)*
[redacted]	[redacted]	s 9(2)(a) [redacted]	[redacted]	[redacted]	Landowner	2016	Y

SECTION C: Project details

See pages 15 and 16 of the Guide for Applications 2018.

5. Project overview

Project Name	s 9(2)(a) Landfill – s 9(2)(a)
CSRF Phase *(Delete non-applicable phases as required)*	Phase 4 – Remediation
How many years are you seeking funding for?	1
Total project cost	s 9(2)(b)(ii) *What is the cash cost (exclusive of GST) of your project, including Contaminated Sites Remediation Fund funding, external funding, and your organisation's contribution?* ***This does not include in-kind costs, please indicate these costs below.***
Contaminated Sites Remediation Fund contribution	s 9(2)(b)(ii) *How much funding (exclusive of GST) are you requesting from the Contaminated Sites Remediation Fund?* *Projects that are contributing at least 50% of project costs are looked upon more favourably by the CSRF Assessment Panel*
In-kind Contribution *In-kind contributions include project management and monitoring. Roughly 10% of total project costs are considered a standard in-kind contribution.*	s 9(2)(b)(ii) *If you required a higher percentage of in-kind contribution, please outline the reasoning, below:* N/A
Do you require any statutory or non-statutory permissions to complete the project? *For example, resource consents, planning consents, or landowner permissions?*	X Yes ☐ No *If yes, which permission(s) are required? Have you applied for these? If so, when is a decision expected (if known)?* A resource consent for soil disturbance and removal will be required from Christchurch City Council. This will not be applied for until a contract is awarded for the works. A resource consent for stormwater discharge will be required from Environment Canterbury. This will not be applied for until a contract is awarded for the works.

6. Project objectives

Provide between three and six concrete statements which describe the tangible results your project will achieve. Note that some project outcomes will be achieved over a longer timeframe, however the objectives described here must be achievable within the duration of the funding. Please ensure that:

- *objectives are SMART (Specific, Measurable, Achievable, and Realistic within the Timeframe of the project). Refer Appendix 2 (page 42) of the Guide for Applicants 2018 for more information on setting SMART objectives.*
- *all objectives are clearly defined and achievable within the duration of the funding*
- *each objective has at least one key performance indicator (KPI)*
- *successful completion of tasks and activities (question 9) will lead to achievement of the project objectives*
- *you have a clear plan for measuring, evaluating and reporting whether your project objectives have been met.*

Objective *Describe the tangible results your project is trying to achieve.*	**Key performance indicators (KPIs)** *KPIs are concise statements about key benefits of the project and how they will be achieved.*	**How will you monitor and evaluate the achievement of this objective?** *How will you measure your progress and demonstrate that the objective has been achieved?*	**Baseline information** *Describe the current situation, using the data you have available.*	**Expected outcome** *What is the expected benefit from this objective being met? How does this contribute to the purpose of your project?*
The remediation of s 9(2) is undertaken in a manner that minimises any risk from the contaminants present to site workers and owner/occupiers.	The health and safety of site users is maintained by all works being undertaken in accordance with the site health and safety plan.	A Site Health Safety and Environment Plan is submitted by the contractor prior to works. An accident register is available to site workers to record any incidents. Corrective action is taken when an issue is identified.	Property owners have site management plans for current use of their land.	The health and safety of workers and occupants is protected.
s 9(2)(a) being regarded as at least 'managed for residential land use'.	The affected property is able to be used with limited restrictions for regular tasks after replacement/covering of contaminated fill material.	The property included in this application is categorised on Environment Canterbury's Listed Land Use Register as "Managed for Residential Land Use" based on evaluation of completion reports in accordance with CLMG 1 and 5.	The property is currently regarded as "contaminated for residential land use" and are categorised as such on the Listed Land Use Register.	The affected property is able to be used with limited restrictions for regular tasks. The long-term health and wellbeing of residents is protected from fill material.

The remediation of s 9(2) is done in a way that is acceptable to current owners and realistically usable by future owners.	Trust from the community is maintained or improved in local and national organisations, and The affected property can be used with limited restrictions for regular tasks, by Using excellent consultation with residents prior to site works and regular communication during site works.	A minimal number of complaints from residents and no withdrawal from the project by current owners.	An assessment of remediation options has been made and consultation with owners on what option is preferred for how they use their property.	Residents will be satisfied with the project and have confidence in the organisations involved to act in the residents' interest.
Develop and maintain relationships between Christchurch City Council, Environment Canterbury, and Canterbury District Health Board in order to coordinate responses for community wide issues.	Contacts between the organisations are improved and more efficient responses can be made for similar situations using regular meetings and communications documenting progress and key learnings during this project.	Regular meetings and updates will be recorded. An assessment of 'lessons learned' made at the end of the project.	Christchurch City Council, Environment Canterbury, and Canterbury District Health Board have been making a cooperative and coordinated effort since 2016 at s 9(2)(a) Landfill.	Christchurch City Council, Environment Canterbury, and Canterbury District Health Board will have more efficient responses to similar situations.

7. What environmental, social, cultural and economic benefits will occur as a result of this project?

Please outline the economic, environmental, social and/or cultural benefits that will result from the completion of your project. Project benefits may be achieved outside the life of the CSRF funding. Add more rows if required.

See pages 24-25 of the Guide for Applicants 2018 for information on how to complete this question.

Examples include:

- *Environmental - eg, reduction of harm to the environment, improved environmental values*
- *Social - eg, human health, enhanced public safety, improved aesthetics and amenities*
- *Cultural - eg, enhanced cultural awareness/kaitiakitanga,*
- *Economic - eg, future monetary benefits from the remediation of the site*
- *Sustainability - eg, sustainable remedial options to reduce waste to landfill*

Type of benefit	Description
Environmental	• A reduction in the volume of contaminated fill material at the location will have reduced effect on groundwater from the fill material. • Plants and wildlife across 16 properties will be separated from contaminated fill material.
Social	• The risks to human health will be considered to be managed because a physical barrier will prevent human exposure to contaminated soil at depth. • Site users will be able to use and visit the affected properties with few limitations.
Economic	• The value of properties will be increased to that prior to knowledge of contamination. • The financial burden of remediation will not be passed on to future site users.
Sustainability	The site will be remediated in a way that requires little ongoing maintenance.

8. Risk management

Provide a brief description of the major risks to the project achieving the intended outcomes. Include consideration of potential barriers that may pose a risk to the success of the project. Where possible give an indication of the likelihood and significance of the risk and any mitigation strategies to be included in the project.*

*See page 26 of the Guide for Applicants 2018 for information on how to complete this question. *Risks to human health and the environment should be outlined in the supporting documents*

Potential risk *Identify the potential risk to your project (for example, project not completed on time, unpredictable events such as weather, lack of resource commitment, time and cost estimates too optimistic, unexpected budget cuts, stakeholders changing requirements after the project has started, risks to the industry or sector to which the organisation belongs).*	**Level of risk** *Low, medium or high.*	**Impact on project** *Describe the impact the risk would have on the project (for example, misunderstandings, duplication of work, incomplete work).*	**Consequence on project** *Minor, moderate or severe.*	**Strategy to mitigate** *Describe the process you will use to minimise and manage the risk (for example, project manager monitors functional roles to ensure enough time is allocated to complete each task/activity and the project as a whole).*
Project not completed on time	Medium	Loss of confidence by the community in organisation's abilities and increased costs.	Moderate	Consultant project manager sets and monitors an expected timeline of stages of works. Excellent communication with landowners.
Project not completed on budget	Medium	Incomplete work	Severe	An assessment of cost had been made in the assessment of remedial options. The project is put to competitive tender with clear requirements and targets.
Property owners change requirements after the project has started	Low	Incomplete work	Moderate	Excellent communication and individual property works plans made with site owners prior to works.
Property sold during project	Low	Incomplete work	Minor	Transfer landowner names on the Deed of Funding. Maintain the Listed Land Use Register to ensure

				potential new owners of the current issues.
Media interest	Medium	Slowed work	Moderate	A communications plan currently exists with messaging to present to media. We will not initiate contact with media (e.g. media releases, website updates). Good relations to be maintained with land owners and the community.
Neighbourhood objections to works	Medium	Slowed work	Moderate	Contractor to ensure that affected properties and neighbours are informed of what is happening and timelines prior to work. All properties surrounding s 9(2)(a) Road are similarly affected.
Site access is not coordinated	Medium	Slowed or duplicat on of work resulting in higher cos s.	Moderate	Consultant Project Manager and contractors coordinate access and works across properties in a planned timeline.

SECTION C: Resources, capability and partnerships

See pages 27-29 of the Guide for Applicants 2018 for information on how to complete this section.

9. Project team including contractors

You must be able to demonstrate that the project will engage personnel with the required technical, project management, and financial management skills to successfully deliver the project. Provide details of your proposed project team and confirmation of their availability for the duration of the project. Note that it is mandatory to provide details of your project manager.

See page 27 of the Guide for Applicants 2018 for information on how to complete this question.

Name	Organisation	Role in project	Confirmed	Phone	Email
Conor Parker	Environment Canterbury	Project manager *Note that you **must** provide a copy of the project manager's CV or job description of project manager as part of your application.*	Yes	027 839 0101	conor.parker@ecan.govt.nz

If the application is successful, a consultant will be engaged to manage the project in accordance with Environment Canterbury's Procurement and Contract Management Strategy. A procurement plan will be produced and consultants engaged for tendering through TenderLink or GETS in an open competitive procurement method. The Ministry for the Environment will be informed of the successful applicant and their details provided.

10. Governance and management structure

See page 28 of the Guide for Applicants 2018 for information on how to complete this question.

Project governance *Describe the governance structure/s that will be implemented to ensure monitoring and management of performance and effective decision-making occurs. Include information on members of the governance group and their skills.*	Project Sponsor – Stefanie Rixecker (Director Science) Project Lead – Graham Aveyard (Team Leader Contaminated Land, Environmental Science and Hazards) Project Manager – Conor Parker (Senior Scientist) Consultant – TBA Regular (weekly or fortnightly) meetings will occur between the Project Manager and the Consultant. The Ministry for the Environment will be provided weekly updates of progress and issues.
Managing funds *Provide information about how you will manage the project funds if your application is successful. Include information about how you will procure goods and services, approve payments, and monitor and address budget overspend.*	Environment Canterbury have a robust competitive procurement process for projects/expenses valued over s 9(2)(b)(ii). An open tender will be made following the development of a procurement plan that provides specifications of the contract, timelines, and evaluation criteria to compare competing bids. The contract will be awarded for a fixed dollar amount. Any variation from this will require a written variation of contract with Environment Canterbury. Regular (weekly/fortnightly) meetings will take place with the contract manager to report on progress and to identify issues regarding costs and time.

11. Partnerships

See page 29 of the Guide for Applicants 2018 for information on how to complete this question.

Is the current landowner(s) (or guarantor) willing to contribute financially to the project *Note, due diligence may be required to be undertaken on the landowner if application is successful.*	☐ Yes ✓ No *If no, is the landowner willing to support the project in other ways?* The landowner may be able to provide funds for decking to cover up to 50% of the current lawn area which would also be regarded as a viable management option.
Which individual organisations will be involved in the project *List the name of the organisation and details of their involvement*	Environment Canterbury Christchurch City Council Community and Public Health CDHB
Who are the projects key stakeholders *List the name of the stakeholders and details of their interest in the project*	• The current landowner and neighbouring properties. • Environment Canterbury are the organisation responsible for making the CSRF application and monitoring contaminated land in Canterbury. • Christchurch City Council are responsible for administering the NES for Assessing and Managing Contaminants in Soil to Protect Human Health and land use within Christchurch City.

12. Health and safety

It is important that you have the necessary health and safety policies, resources and expertise to safely undertake and complete the project. You must comply at all times with the requirements and provisions of the Health and Safety at Work Act 2015 (HSWA). You will be asked to submit a health and safety plan for your project if you are invited to proceed to Stage 2. See page 28 of the Guide for Applicants 2018 for information on how to complete this question.

Does your organisation have a health and safety policy?	✓ Yes ☐ No *If yes, state when this was last reviewed/updated.* 2014
Has your organisation or any other parties involved been issued with any notices under health and safety legislation?	☐ Yes ✓ No *If yes, please provide details.*
Who will be responsible for health and safety for the project?	Health and Safety will be the responsibility of the consultant that performs the works required at s 9(2)(a) Landfill. A Health and Safety Plan will be provided by the consultant and approved by Environment Canterbury before the start of works. This document will be supplied to the CSRF.

SECTION D: Additional information

See pages 30-31 of the Guide to Applicants 2018 for information on how to complete this section.

13. Conflicts of interest

Describe any known conflicts of interest (actual or potential) and steps you will take to manage them. Before completing this section, see page 30 of the Guide for Applicants 2018.

The current landowners have an arrangement as part of their sale agreement to have the land remediated to a standard considered as managed by Environment Canterbury. $s 9(2)(b)(ii) has been retained in a trust account with a lawyer and communication has broken down with the previous owner. The current landowners are being encouraged to gain legal advice.

14. Is there anything else we need to consider about your application?

Provide any additional information you or your organisation considers important, but has not been covered in previous questions in this application form. (maximum 400 words)

- s 9(2)(a) is one of a number of properties affected by the landfill and is considered to be an integral part of the wider project in terms of time and cost due to the savings that could be made with a coordinated effort.
- The current owners paid s 9(2)(b)(ii) (RV s 9(2)(b)(ii) for the property on 22 November 2017.
- The land owners are not in a financial position to provide funds for the required remediation. Environment Canterbury and Christchurch City Council have made substantial contributions to investigations of the landfill and in-kind with time. As a result, 100% funding is being requested for the project.

Declaration

This declaration must be completed by a person with the organisation's signing authority. See page 31 of the Guide for Applicants 2018 for additional information on how to complete this question.

***Important:** Please contact the Ministry if you have any queries about the terms and conditions of the deed of funding for the Contaminated Sites Remediation Fund.*

As a duly authorised representative of the organisation as per Section A of this Contaminated Sites Remediation Fund application form:

- I declare that my project meets all of the eligibility criteria for the Contaminated Sites Remediation Fund (*see page 4 of this application form*).
- I declare that to the best of my knowledge, the information contained in all sections of this application form, or supplied by us in support of our application, is complete, true and correct.
- I declare that I have the authority to sign this application form and to provide this information.
- I declare that the application is not being made by an organisation that is in receivership or liquidation, or by an undischarged bankrupt.
- I declare that I have provided information about any actual or potential conflicts of interest (in question 13) and that I will promptly inform the Ministry for the Environment of any such conflicts if they arise subsequent to the submission of this application.
- I understand that information presented to the Minister for the Environment and Ministry for the Environment is subject to disclosure under the Official Information Act 1982, other legislation, court orders, and in response to Parliamentary questions.
- I understand my rights in accordance with the Privacy Act 1993.
- I agree that the Ministry for the Environment can undertake, for the purpose of assessing eligibility and suitability for Contaminated Sites Remediation Fund funding, a background check on the applicant(s), including but not limited to credit checks, criminal record checks, and reference checks from other parties, and may liaise with local and national organisations about this application.
- I understand that if I receive an invitation to proceed to Stage 2 of the funding process this is not a confirmation of funding, and that the final decision is subject to a successful completion of Stage 2.

Name	Graham Aveyard	
Position	Science Team Leader: Environmental Science and Hazards	
Signature *By typing your name in the space provided you are electronically signing this application form.*	Graham Aveyard	Date 28/09/2018

Checklist

Use the following checklist to confirm you have provided all the required information in your application.

Do not include any attachments that the Ministry has not specifically requested. These will not be provided to the assessment panel.

- ☐ All sections of this Application Form (Part 1) have been completed (using 'N/A' or 'none' if required).
- ☐ All sections of this Application Form (Part 2) have been completed (using a zero if required).
- ☐ All $ figures provided in Application Form (Part 1) and (Part 2) add up and are consistent throughout the application.
- ☐ Declaration on the Application Form (Part 1) has been electronically signed and dated.
- ☐ Letters confirming co-funding for your project from each organisation listed as 'external funding sources' in Application Form (Part 2).
- ☐ **Supporting Documents – you must include the appropriate site investigation/remedial plan/etc** in support of your application depending on what project phase you are applying for.
- ☐ Application form, project budget, and any supporting information will be submitted as **one email only**. (Documents submitted as multiple emails will **not** be accepted.)
- ☐ Application form, project budget, and any supporting information will be submitted no later than **5:00 pm** on the **last working day of March or September**.

19-D-02771

Christchurch City Council

DOCUMENT 05

19 July 2019

03 941 8999

53 Hereford Street
Christchurch 8013

PO Box 73013
Christchurch 8154

ccc.govt.nz

The Chief Executive
Environment Canterbury
200 Tuam Street
CHRISTCHURCH

Email: Bill.Bayfield@ecan.govt.nz

Dear Mr Bayfield

Contaminated Residential Sites, s 9(2)(a)

Following a joint investigation by ECan and Christchurch City Council in to the contaminated land in Opawa, an application was made on behalf of the residents to the Ministry for the Environment for funding. You will be aware that the Ministry has approved 70% funding levels from its Contaminated Land Remediation Fund for 19 properties in s 9(2)(a) Christchurch, as well as 30% funding for two other properties which are in a different category.

At a recent meeting Councillors requested staff to investigate a request to the Ministry for the Environment to reconsider the level of funding to 100%. This was for the following reasons;

- The contamination levels are many times above the National Environmental Standards
- The contamination is not as a result of the actions of the current owners and nor was it sanctioned by the Christchurch City Council or its predecessor
- It is unlikely that property owners will be able to afford, or elect to have the remediation carried out if they have to bear some of the cost
- The Christchurch City Council is already dealing with the costs of recovering from New Zealand's largest natural disaster
- The purpose of the Contaminated Land Remediation fund is to deal with these situations

As Environment Canterbury is leading this application process, we felt that it would be best if a request for reconsideration of the funding level came from your organisation. Could you please consider our request and make an approach to the Ministry for the Environment.

Yours faithfully

Leonie Rae
Acting Chief Executive
Christchurch City Council

Christchurch City Council

19-D-02771

Eliot Sinclair & Partners Limited
Consulting Surveyors • Consulting Engineers

Land Surveyors
Civil & Structural Engineers
Land Development Consultants
Hydrographic and Photogrammetric Surveyors
Advanced Computer Applications in Surveying and Engineering

Level 5, Transport House
151 Kilmore Street
PO Box 4597
Christchurch, New Zealand
Telephone (03) 379-4014
Fax (03) 365-2449
Email esp@eliotsin.co.nz

Our Ref: 181544

23 December 1998

Christchurch City Council
Sockburn Service Centre
PO Box 11011
Sockburn
CHRISTCHURCH 4

Attention: Mr G. Marsh

Dear Sir

Re: s 9(2)(a) - LIM Hazard - 'Uncontrolled Fill'

We are writing to provide information on the 'Uncontrolled Fill' hazard identified in the Council's Land Information Memorandum dated 28 October 1998.

We understand from discussions with you that a number of surrounding properties along s 9(2)(a) also have this hazard classification on their respective property files, although there is no certainty that this hazard exists on all properties. We also understand that the term 'Uncontrolled Fill' generally relates to pits that were excavated to recover shingle deposits for construction purposes, generally pre-1940s, and were later infilled and covered over.

We have therefore carried out a site investigation of the above property to confirm the ground conditions and the relevance of the LIM hazard. We report as follows.

The property has been well developed with the construction of a two storey house of approximately 15 years old, a detached garage and an in-ground swimming pool and there is minimal, if any, scope for building extensions in the future. The outdoor living area adjacent to s 9(2)(a) along the eastern boundary has been landscaped and built up with planter boxes to form level terraces.

Our investigation consisted of a series of hand auger holes to a depth of up to 2.8 metres and corresponding Scala penetrometer tests to 1.4 metres depth located in the lawn and garden areas around the buildings. We also carried out a visual inspection of the house and garage to check for signs of foundation settlement.

The test bores generally revealed a topsoil layer of varying thicknesses overlying various layers of natural silt and sand material to at least 2.8 metres depth. Only one test site (No. 2) indicated localised shallow disturbed ground to 500mm depth. This area could have been disturbed for any number of reasons, and it is likely to have been associated with the house construction. It is not significant and certainly does not relate to an area of 'Uncontrolled Fill'.

The safe bearing pressures inferred from the penetrometer tests were variable in the top 800mm of material, typically of between 50kPa to 100kPa. Below this depth bearing pressures were consistently around 100kPa. The variation and lower readings in the upper layers is typical of natural fine silty sand material. This would only have a minor influence on foundation requirements for new buildings, such as a requirement to widen out the base of the foundation footings.

Our visual inspection of the section noted that there has been some movement in the concrete pavers on the eastern side of the house adjacent to s 9(2)(a) As indicated previously, along the s 9(2)(a) this area has been built up and landscaped. There is also a very large gum tree in this area and we understand that a similar sized tree was located nearby and has since been removed. The movement of the pavers is most likely related to a combination of minor settlement of the sub-base material beneath the pavers and to tree root intrusion.

A visual check of the exterior and interior of the house and garage revealed no obvious signs of foundation movement and it can be concluded that the building foundations are adequate for the ground conditions. Also, from these observations and the fact that we did not encounter any uncontrolled fill around the buildings, that it is very unlikely that suspect ground is present beneath the buildings.

In summary, our investigation revealed no signs of uncontrolled filling on the site of the nature inferred from the Council's LIM. We consider that the building's foundations are adequate for the ground conditions.

We request that you hold a copy of this report on the Property File and summarise our investigation and conclusions and record this on future LIM's issued for this property to identify that the 'Uncontrolled Fill' hazard has been investigated.

Please contact me if you have any questions.

Yours faithfully
ELIOT SINCLAIR & PARTNERS LTD.

Richard Wilson
rhjw:li
181544-001-rhjw

c.c. Mr & Mrs Georgieff
C/- Weston Ward & Lascelles
Solicitors
PO Box 13339
Christchurch

Eliot Sinclair & Partners Limited
Consulting Surveyors • Consulting Engineers

19-D-02771

Eliot Sinclair & Partners Limited
Consulting Surveyors • Consulting Engineers

Level 5, Transport House, 151 Kilmore St.
PO Box 4597, Christchurch N.Z.
Ph. (03) 379-4014 Fax. (03) 365-2449

Job Number	181544
Date Tested	2/11/98
Page 1 of 4	

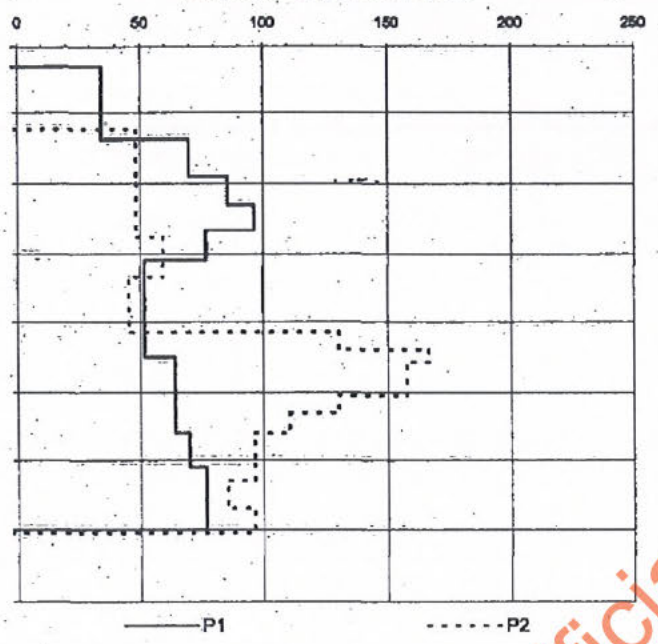
SITE INVESTIGATION RECORD

D.P	
Lot	
Project No.	

Client s 9(2)(a) **Site** s 9(2)(a)

SCALA PENETROMETER TESTS

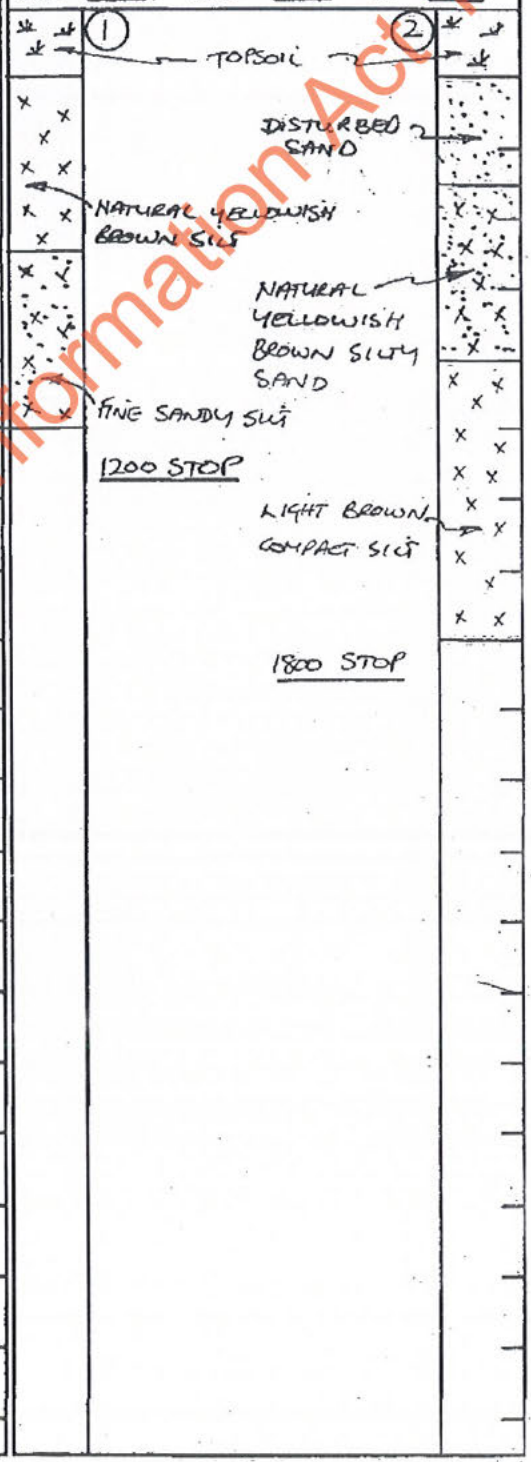
Inferred Bearing Pressure [kPa]



DEPTH [m]

BORE LOGS

Hand Auger [X] Machine Auger [ ] Test Pit [ ]



s 9(2)(a)

s 9(2)(a)

Registered Engineer [signature] Date: 23/12/98

19-D-02771

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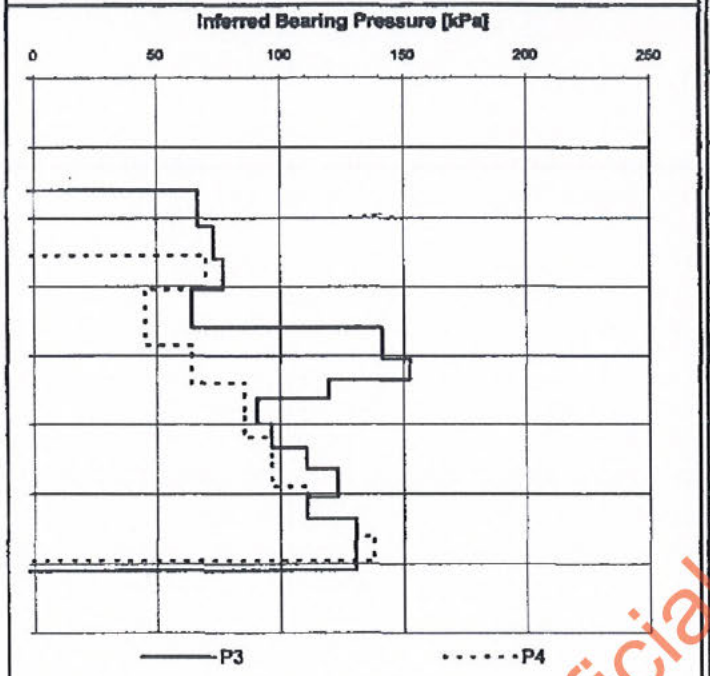
Job Number	181544
Date Tested	2/11/98
Page	2 of 4
D.P	
Lot	
Project No.	

SITE INVESTIGATION RECORD

Client s 9(2)(a)

Site s 9(2)(a)

SCALA PENETROMETER TESTS



DEPTH [m]

GL
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2
2.4
2.6
2.8
3.0
3.2
3.4
3.6
3.8
4.0

BORE LOGS

Hand Auger [X] Machine Auger [ ] Test Pit [ ]

(3) (4)

BORELOG RESULTS SIMILAR TO (1)

SITE PLAN

North

SEE PAGE 1 OF 4

COMMENTS

Registered Engineer R Hyndman Date: 23/12/98

19-D-02771

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Level 5, Transport House, 151 Kilmore St.
PO Box 4597, Christchurch N.Z.
Ph. (03) 379-4014 Fax. (03) 365-2449

Job Number 181544
Date Tested 2/11/98
Page 3 of 4

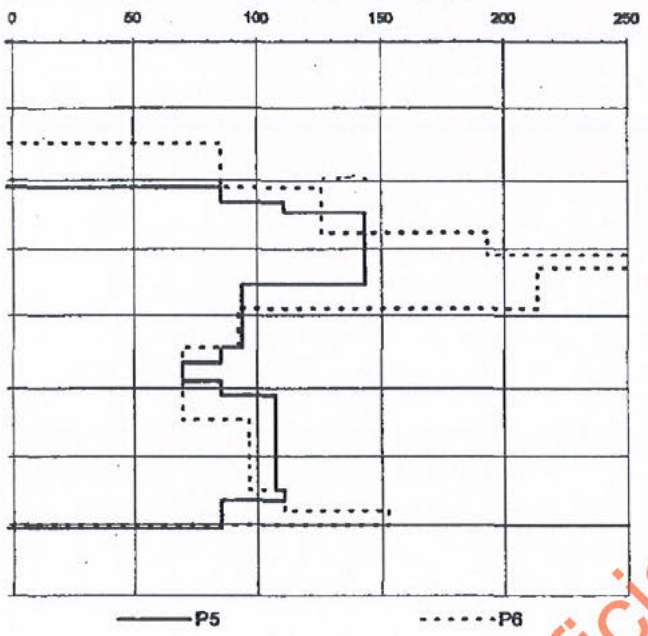
SITE INVESTIGATION RECORD

D.P
Lot
Project No.

Client s 9(2)(a)

Site s 9(2)(a)

SCALA PENETROMETER TESTS



DEPTH [m]

GL, 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.2, 2.4, 2.6, 2.8, 3.0, 3.2, 3.4, 3.6, 3.8, 4.0

BORE LOGS

Hand Auger [X] Machine Auger [ ] Test Pit [ ]

(5) (6)

BORELOG RESULTS SIMILAR TO (1).

SITE PLAN

North

SEE PAGE 1 OF 4

COMMENTS

Registered Engineer [signature] Date 23/12/98

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Job Number	181544
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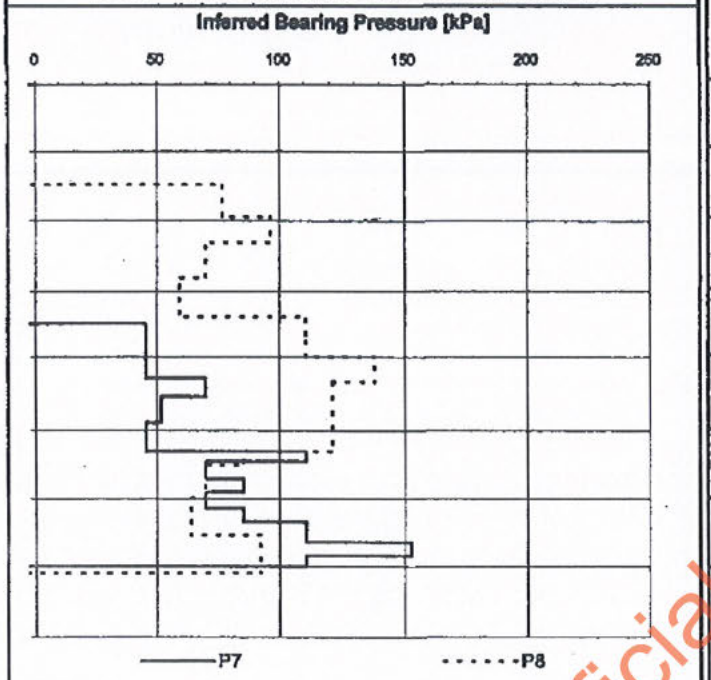
Page	4 of 4

SITE INVESTIGATION RECORD

D.P	
Lot	
Project No.	

Client s 9(2)(a) **Site** s 9(2)(a)

SCALA PENETROMETER TESTS



SITE PLAN

North

SEE PAGE 1 OF 4

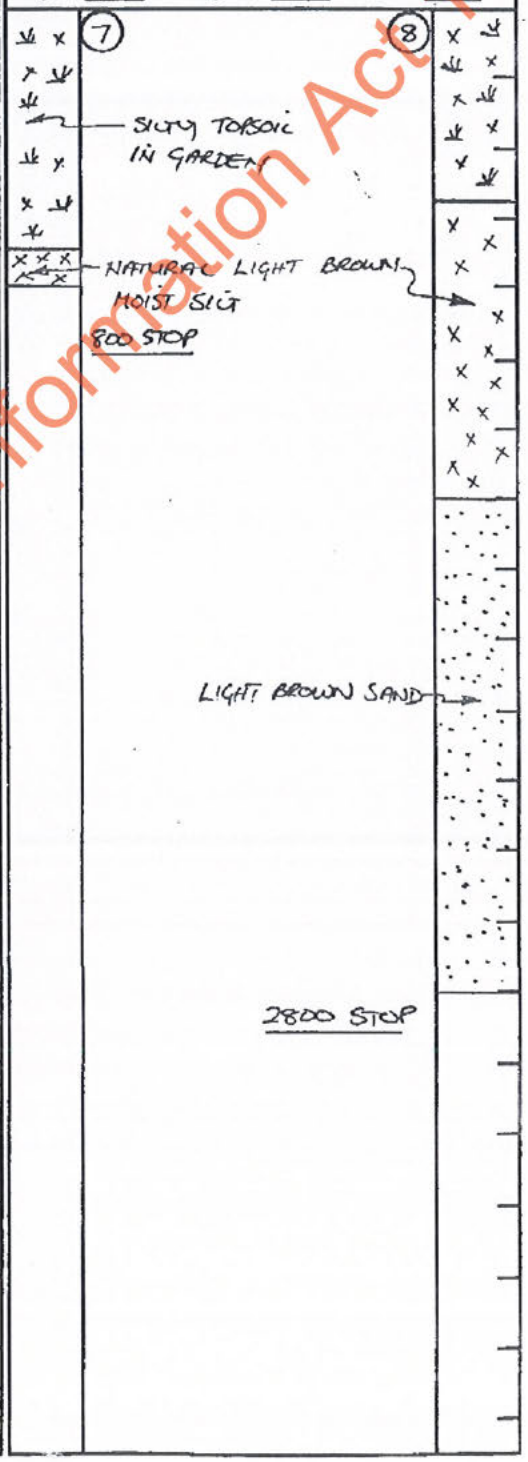
COMMENTS

Registered Engineer Date: 23/12/98

BORE LOGS

DEPTH [m]

Hand Auger X Machine Auger ☐ Test Pit ☐



Southern Response
C/- Arrow International (NZ) Ltd

29 July 2013

RE: Environmental Soil Investigation at s 9(2)(a) **, Christchurch.** s 9(2)(a) **.**

1. Introduction

Geoscience Consulting (NZ) Ltd (Geoscience) was requested by Arrow International (NZ) Ltd (Arrow) to undertake an intrusive soil investigation at the above property (herein referred to as "the site") as part of the Southern Response Project. We understand the site has been identified as potentially having a hazardous industry or activity undertaken on it as determined on the Ministry for the Environment (MfE) Hazardous Activities and Industries list (HAIL)[1].

2. Objective

The objective of the work is to provide information on the chemical quality of the soil present onsite and potential disposal/management options relating to the sites proposed development.

3. Site Information

Table 1: Summary of Site Description

Item	Description
Location:	s 9(2)(a)
Legal Description:	s 9(2)(a)
Current Site Use:	Residential
Proposed Site Use:	Residential
Site Area:	1079 m^2
Geology[2]:	Dominantly alluvial sand and silt overbank deposits
Identified HAIL activities:	G3 – Landfill Sites.

4. Potential Issues

Dependent on the original waste source and composition. The MfE provides a list of substances typically associated with individual activities or industries[3]. Using this as a guide and based on visual evidence during the sample collection, Geoscience suggested that the soils at the site were sampled for analysis of contaminants typically found in a landfill which include heavy metals (As, Cd, Cr, Cu, Pb, Ni and Zn), and Polycyclic Aromatic Hydrocarbons (PAHs), to provide an indication of soil quality.

5. Site Investigation

Geoscience visited the site on the 15th July 2013 and undertook soil samples in conjunction with the geotechnical investigation. The environmental investigation comprised:

- Collection of 4 samples from 0.3 m below ground level (bgl). All samples were submitted to R J Hill Laboratories (Hills) with 1 composite requested to be made from the 4 samples;
- Analysis of the 1 composite soil sample for a suite of common heavy metals (As, Cd, Cu, Cr, Ni, Pb and Zn) and PAHs.

All fieldwork was carried out following procedures for the appropriate handling of potentially contaminated soils, including:

- Each soil sample was visually and olfactory inspected for indicators of contamination;
- The samples were collected from 0.3 m bgl using a hand auger. The soil was compressed directly into laboratory supplied containers by the field technicians using a new pair of nitrile gloves for each sample;
- Prior to sampling, equipment was decontaminated using a triple wash procedure with Decon 90 solution, potable water and deionised water; and
- Following collection, all samples were placed directly into a chilly bin prior to transport, under standard Geoscience chain of custody procedures, to Hills for analysis.

6. Adopted Investigation Criteria

The specific criteria referenced in this report have been selected in accordance with the *National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*[3] (NES) and the *MfE Contaminated Land Management Guidelines No.2 – Hierarchy and Application in New Zealand of Environmental Guideline Values*[4].

Residential land use criteria with an anticipated ingestion of 10% produce grown on the site have been selected considering the current and proposed end use of the site. Criteria for Maintenance / Excavation activities have also been presented to assess the risks to human health during redevelopment earthworks and for future maintenance of underground services.

The MfE criteria were adjusted according to the requirements for composite samples specified in the MfE *Contaminated Land Management Guidelines No.5 – Site Investigation and Analysis of Soils*[5]. As the composite samples consisted of 4 sub-samples, the guideline criteria were divided by 4 to result in the adjustment criteria for the composite samples used in this investigation.

Burwood Landfill use the recreational guidelines as acceptance limits and the results have been assessed against these criteria which have not been adjusted as the composite samples provide an indication of the average concentration present.

7. Results

The surface soil encountered is shown in Table 2 below:

Table 2: Summary of Typical Subsurface Conditions

Depth (m)	Material Type
0.0 – 0.2	SILT with some sand, trace rootlets, trace brick; brown [FILL]
0.2 – 1.5	SAND with minor silt, trace ceramic, trace gravel, trace charcoal, trace rootlets; dark brown [FILL]

Visual signs of contamination were noticed, with the soil containing small pieces of ceramic, brick and glass. Pieces of metal were observed with the soil stained blue.

Table 3 presents the summary of the heavy metals and PAH concentrations. Full analytical results are presented in Attachment 2.

Table 3: Laboratory Test Results

Sample Name	**S1**	Soil Contaminant Standards Residential Land Use ALL PATHWAYS[1] (Adjusted)	Soil Contaminant Standards Recreational Land Use[2]	Soil Contaminant Standards *Maintenance/excavation workers*[3] (Adjusted)
Soil Type	SAND			
Sample Depth, m	0.3			
Heavy Metals in soil, mg/kg				
Arsenic	**26**	5	80	17.5
Cadmium[5]	**4.8**	0.75	400	325
Chromium[6]	44	115	2,700	1,575
Copper	720	>2,500	>10,000	>2,500
Lead	***4,400***	52.5	880	825
Nickel	78	150[4]	600	-
Zinc	**2,700**	1,750[4]	14,000	-
ΣBaP[7]	***32.96***	2.5	40	8.75

Notes: [1] Adjusted MfE, 2012. Soil Contaminant Standards, Residential Land Use Exceeded concentrations are highlighted in **bold**.

[2] MfE, 2012. Soil Contaminant Standards, Recreational Land Use. Exceeded concentrations are highlighted in *italics*.

[3] Adjusted MfE, 2012. Soil Contaminant Standards, Maintenance/excavation workers. Exceeded concentrations are underlined.

[4]Guideline on the Investigation Levels for Soils and Groundwater (NEPC, 1999); Health Investigation Level.

[5] Assumes soil pH of 5.

[6] Criteria for Chromium VI were conservatively selected.

[7] Risk associated with a mixture of carcinogenic PAH's calculated using criteria based on Benzo(a)pyrene equivalent concentration. Refer to Section 4.4.3 of the MfE (1999) Guidelines.

Results of the soil sample analysis show exceedances of arsenic, lead and PAH for residential land use and maintenance/excavation workers; and cadmium and zinc for residential land use. Lead and PAH was also exceeded for recreational land use.

8. Conceptual Site Model

A contamination conceptual side model consist of three primary components to allow the potential for risk to be determined, these are:

- Source of contamination;
- Pathway to allow the contamination to mobilise; and
- Sensitive receptors which may be impacted by the contamination.

Table 4: Conceptual Site Model

Source	Pathway	Receptor
Potential landfill waste	Direct contact; ingestion or inhalation of Soil; Surface/groundwater; Air/Wind blown	Future residents/site workers. Surrounding residents and environment.
Risk of Contamination	**High** – elevated concentrations of arsenic, lead, cadmium, zinc and benzo(a)pyrene equivalent were returned. Measured concentrations of lead and benzo(a)pyrene equivalent exceed all the applicable criteria (i.e residential, recreational and maintenance/excavation workers).	

9. Conclusions and Recommendations

The soil analysis results show arsenic, lead, cadmium, zinc and benzo(a)pyrene equivalent exceeding residential guideline values, and arsenic and lead exceeding the guideline values for maintenance / excavation workers. Therefore impacted soils are present which may effect the site redevelopment workers and the site end users. To minimise the impacts on the site workers and the surrounding population and environment, mitigation measures should be outlined in a redevelopment site management plan.

During the redevelopment at the site, the volume of soil disturbance needs to be checked to determine if the NES is triggered. The triggering of the NES is dependent on the final foundation design for the site and may require additional consent to be applied for. Since only the sleep-out and not the residential dwelling present on site will be rebuilt, the anticipated volume of soil to be disturbed or removed from site is likely to be below the NES guideline values. Therefore it is unlikely that the NES will be triggered.

The soil concentrations returned for ead and BaP exceed the recreational guideline criteria, and are therefore not suitable for disposal at Burwood Landfill. If any soil is to be disposed of site during the work it is likely that it will have to go to Kate Valley, however toxicity characterisation leachate potential (TCLP) tests are required before the soil will be accepted and should be undertaken if required.

As the sample analysed was a composite, the laboratory results provide an average concentration for soils that may be excavated from the site.

Site occupants should also be informed of the confirmed presence of contaminants in the underlying soil and potential long term impacts from this material.

10. REFERENCES

1 MfE Oct 2011: *Ministry for the Environment Hazardous Activities and Industries List.*

2 Brown, L.J., Webber, J.H., 1992: Sheet 1 - Geology of the Christchurch Urban Area 1:25,000. Institute of Geological and Nuclear Sciences, Lower Hutt.

3 MFE 2012: *Users' guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.*

4 MfE 2011: *Contaminated Land Management Guidelines No.2 : Hierarchy and Application in New Zealand of Environmental Guideline Values.*

5 MfE 2011: *Contaminated Land Management Guidelines No.5: Site Investigation and Analysis of Soils*.

6 MfE 1999: *Guidelines for Assessing and Managing Petroleum hydrocarbon Contaminated Sites in New Zealand: Module 4 – Tier 1 Soil Screening Criteria.*

11. Limitations

i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Arrow International (NZ) Ltd, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site inspections and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the Client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it must be appreciated that actual conditions could vary from the assumed model.

iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

iv. This Limitation should be read in conjunction with the AMI Canterbury Earthquake Reconstruction (ACER) Project – Master Agreement with Arrow International (NZ) Ltd dated 30th January 2012.

v. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on 03 328 9012 if you require any further information.

For and on behalf of Geoscience Consulting (NZ) Ltd,

Ellen Clara

Engineering/Environmental Geologist

David Robotham, CEnvP

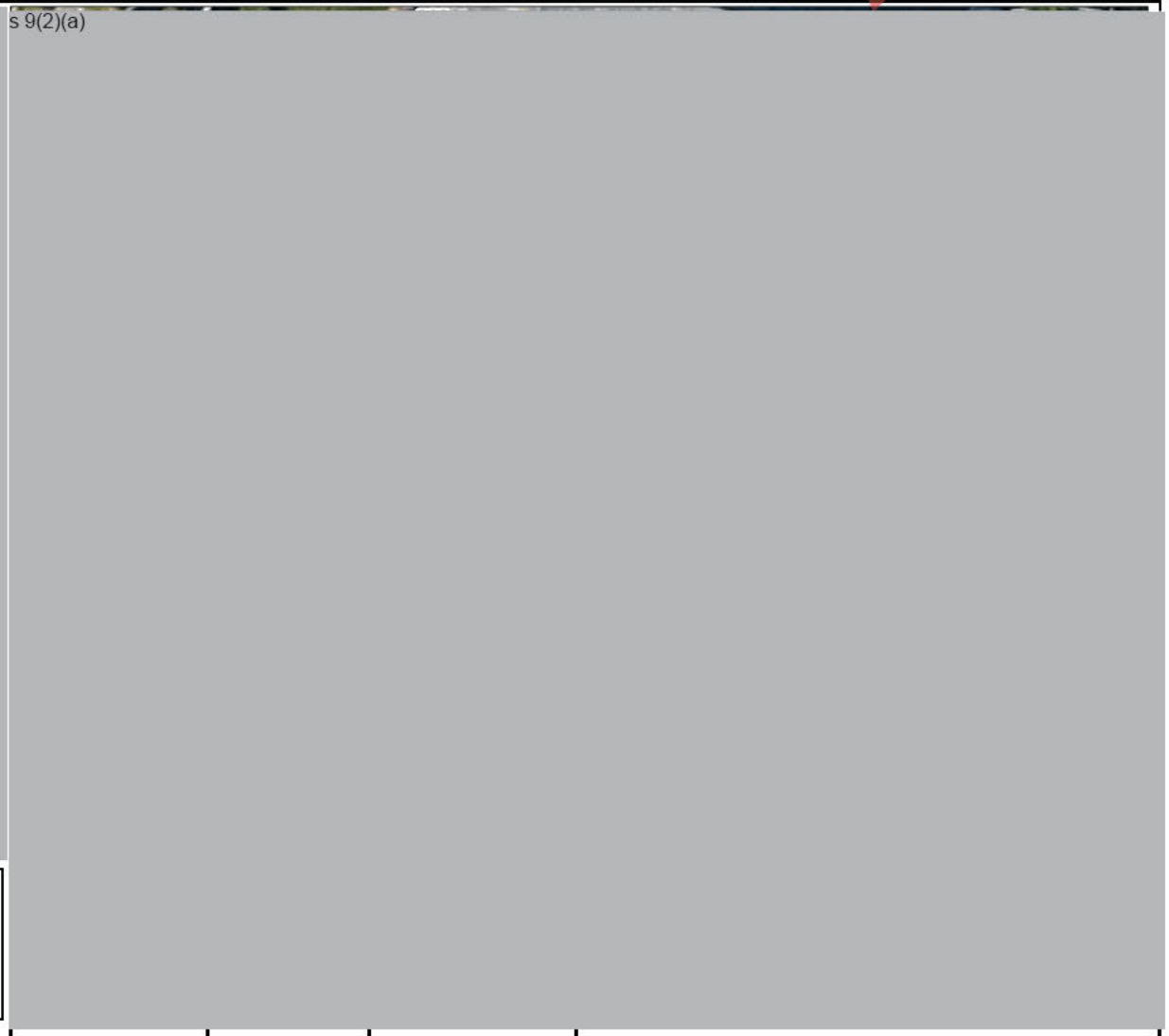
Associate Environmental Consultant

Attachments:

- Site Location Plan

- Laboratory Analysis Results

s 9(2)(a)



⊕ = Test Location

Note: All images sourced from Google Maps

GEOSCIENCE
A proud partner of ENGEO

Date	Jul-13	**Client**	**Southern Response c/- Arrow International NZ Ltd**		
Drawn by	EC	**Project**	s 9(2)(a)		
Approved by	DR	**Description**	**Site Location Plan**		
Scale	NTS	**Geoscience Ref.**	9653.001.204	**Client Ref.**	D3464919

19 D 02271

ENVIRONMENTAL Analysis Request Form

Hill Laboratories
R J Hill Laboratories Limited — accredited
Accreditation NZ

Job No: 115 6214
Date Recv: 15-Jul-13 16:69
No of samples: 0 No of Fractions: 0

1 Clyde Street, Telephone: +6
Private Bag 3205, Facsimile: +6

3111562140

Hill Laboratories office use only:
Date In | Job # | No. of Samples

CLIENT

Name: Geoscience Consulting (NZ) Ltd. [160117]
PO Box 110
Lyttelton 8841

Phone: 03 328 9012 Fax:

Client Reference: 9653 s 9(2)(a) (Project Code)

Quote Number: 53616 Order No: (Cost Centre)

Submitted By: Eamon

Charge To: Geoscience Consulting (NZ) Ltd. [160117]

RESULTS TO

☐ Mail Client ☐ Mail Submitter
☐ Fax Results
X Email Results: hazel@nzgeoscience.co.nz

✠ C.O.C & coversheet to be scanned and emailed back

Additional Information

Please scan and email the COC form to
hazel@nzgeoscience.co.nz

Chain of Custody Record

Delivered to Hill Laboratories (Depatched by)	Date & Time:	Eamon Goodwin 4.25pm
	Name:	
	Signature:	
Received at Hill Laboratories	Date & Time:	15 JUL 13 PM 4:24
	Name:	
	Signature:	
Condition	☐ Ambient Temp	☐ Chilled 10.5 °C

PRIORITY ☑ Normal (up to 10 days) ☐ High (approx 5 days) ☐ Urgent (MUST be pre-arranged)
Results required by: .....

Sample types

GW	Bore/well	TW	Trade waste	S	Saline water	ES	Soil/Solid
SW	Surface water	E	Effluent	O	Oil	Sed	Sediment
P	Potable/DI	L	Leachate	Sl	Sludge	BS	Biosolid

PI	Plant
BM	Fish/shellfish/Biota
M	Misc (Specify)

Site ID	Sample type	Tests required	Comments
HA01, S1	ES	PAHs + MSHMs	
HA02, S1	ES	PAHs + MSHMs	
HA03, S1	ES	PAHs + MSHMs	
HA04, S1	ES	PAHs + MSHMs	
(Composite)			

KB Item: Version: 1

19-D-02271

Hill Laboratories
BETTER TESTING BETTER RESULTS

R J Hill Laboratories Limited
1 Clyde Street
Private Bag 3205
Hamilton 3240, New Zealand

Tel +64 7 858 2000
Fax +64 7 858 2001
Email mail@hill-labs.co.nz
Web www.hill-labs.co.nz

Job Information Summary

Client:	Geoscience Consulting (NZ) Limited	**Lab No:**	1156214
Contact:	H Atkins	**Date Registered:**	16-Jul-2013 9:24:44 am
	C/- Geoscience Consulting (NZ) Limited	**Priority:**	High
	PO Box 373	**Quote No:**	53616
	CHRISTCHURCH 8140	**Order No:**	
		Client Reference:	9653 s 9(2)(a)
		Add. Client Ref:	
		Submitted By:	Eamon Goodwin
		Charge To:	Geoscience Consulting (NZ)

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
1	HA01, S1 15-Jul-2013	Soil	PSoil250, GSoil300	Composite Environmental Solid Samples
2	HA02, S1 15-Jul-2013	Soil	PSoil250, GSoil300	Composite Environmental Solid Samples
3	HA03, S1 15-Jul-2013	Soil	PSoil250, GSoil300	Composite Environmental Solid Samples
4	HA04, S1 15-Jul-2013	Soil	PSoil250, GSoil300	Composite Environmental Solid Samples
5	Composite of HA01, S1 + HA02, S1 + HA03, S1 + HA04, S1	Soil	GSoil300	Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn; Polycyclic Aromatic Hydrocarbons Screening in Soil

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Samples
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	5
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	-	5
Polycyclic Aromatic Hydrocarbons Screening in Soil	Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample. [KBIs:5786,2805,2695]	-	5
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	5
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	5
Composite Environmental Solid Samples	Individual sample fractions mixed together to form a composite fraction.	-	1-4

19-D-02271

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Hamilton 3240, New Zealand

Tel +64 7 858 2000
Fax +64 7 858 2001
Email mail@hill-labs.co.nz
Web www.hill-labs.co.nz

ANALYSIS REPORT

Client:	Geoscience Consulting (NZ) Limited	**Lab No:**	1156214 SPv1
Contact:	H Atkins	**Date Registered:**	16-Jul-2013
	C/- Geoscience Consulting (NZ) Limited	**Date Reported:**	23-Jul-2013
	PO Box 373	**Quote No:**	53616
	CHRISTCHURCH 8140	**Order No:**	
		Client Reference:	9653 s 9(2)(a)
		Submitted By:	Eamon Goodwin

Sample Type: Soil

Sample Name:		Composite of HA01, S1 + HA02, S1 + HA03, S1 + HA04, S1				
Lab Number:		1156214.5				
Individual Tests						
Dry Matter	g/100g as rcvd	78	-	-	-	-
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	26	-	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	4.8	-	-	-	-
Total Recoverable Chromium	mg/kg dry wt	44	-	-	-	-
Total Recoverable Copper	mg/kg dry wt	720	-	-	-	-
Total Recoverable Lead	mg/kg dry wt	4,400	-	-	-	-
Total Recoverable Nickel	mg/kg dry wt	78	-	-	-	-
Total Recoverable Zinc	mg/kg dry wt	2,700	-	-	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	0.22	-	-	-	-
Acenaphthylene	mg/kg dry wt	1.53	-	-	-	-
Anthracene	mg/kg dry wt	1.73	-	-	-	-
Benzo[a]anthracene	mg/kg dry wt	15.5	-	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	24	-	-	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	20	-	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	22	-	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	8.6	-	-	-	-
Chrysene	mg/kg dry wt	15.1	-	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	4.4	-	-	-	-
Fluoranthene	mg/kg dry wt	24	-	-	-	-
Fluorene	mg/kg dry wt	0.26	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	27	-	-	-	-
Naphthalene	mg/kg dry wt	0.29	-	-	-	-
Phenanthrene	mg/kg dry wt	7.3	-	-	-	-
Pyrene	mg/kg dry wt	25	-	-	-	-

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Samples
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	5

19-D-02271

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Samples**
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	-	5
Polycyclic Aromatic Hydrocarbons Screening in Soil	Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample. [KBIs:5786,2805,2695]	-	5
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	5
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	5
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-4

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

This report must not be reproduced, except in full, without the written consent of the signatory.

Carole Rodgers-Carroll BA, NZCS
Client Services Manager - Environmental Division

Ministry for the Environment
Manatū Mō Te Taiao

Contaminated Sites Remediation Fund

Application Form (Part 1)

Application Overview:	
Council name	Environment Canterbury
Site Name	s 9(2)(a) andfill – s 9(2)(a)
Project name	s 9(2)(a) Landfill – s 9(2)(a)
CSRF Phase *(Delete non-applicable phases as required)*	Phase 4 – Remediation
Total cost of project	s 9(2)(b)(ii)
Amount requested from CSRF	s 9(2)(b)(ii)
Estimated Duration of project	1 year

Official information and privacy

Official Information Act 1982

Important: Information presented to the Minister for the Environment or the Ministry for the Environment is subject to disclosure under the Official Information Act 1982 (OIA). Certain information may be withheld in accordance with the grounds for withholding information under the OIA. Further information on the OIA is available at www.ombudsmen.parliament.nz.

Information held by the Minister or Ministry may have to be released under the OIA in response to a request from a member of the public (or any other body) for that information. If you wish to provide sensitive information to the Minister or Ministry which you do not want released, it is recommended you consult with the Ministry as to whether the information is necessary for the application, and whether there may be grounds in the OIA for withholding the information. For instance, if release of the information would disclose a trade secret, or be likely to unreasonably prejudice the commercial position of the person who supplied or who is the subject of the information, then there may be grounds to withhold the information. If an OIA request relating to your application is received, the Ministry will endeavour to contact you to discuss it, and what the implications of releasing your information are.

The grounds for withholding information must always be balanced against consideration of public interest that may justify release. Although the Ministry does not give any guarantees as to whether information can be withheld under the OIA, it may be helpful to discuss OIA issues with the Ministry in advance if information provided with an application is sensitive.

Privacy Act 1993

Important: The Ministry for the Environment Environment House, 23 Kate Sheppard Place, Wellington 6011 may collect, use, hold or disclose personal information for the purpose of assessing eligibility and suitability for Contaminated Sites Remediation Fund funding. Individuals have the right in accordance with the Privacy Act 1993 to request access to and correction of their personal information. While the provision of personal information is not mandatory, failure to provide requested information could lead to a delay in considering the application or a decline of the same.

Introduction

This application form is for project proposals to the Contaminated Sites Remediation Fund. We strongly recommend that you read the *Contaminated Sites Remediation Fund Guide for Applicants 2018* before completing this application form.

Important information

- To improve your chance of success, refer to the *Contaminated Sites Remediation Fund Guide for Applicants 2018* before completing this form.
- There are two parts to the application form – both must be completed:
  - Part 1 : Project proposal and governance (in Word) [this document]
  - Part 2 : Estimated Project budget *(in Excel)*

  You must fill out both parts as incomplete applications will not be assessed.
- You can move between boxes in this form by using the mouse, pressing the ↑ and ↓ keys on your keyboard, or using the Tab key. Use text only; do not enter images, tables or graphs into the form.
- Complete all questions and the checklist. If a question does not apply to your project, please use 'N/A' or 'none' instead of leaving the reply blank.
- Follow the word limits for those parts that have them. To check the number of words, highlight the text and use Word Count on the Review toolbar.
- We are unable to accept applications which are late or incomplete. An application will not be considered if:
  - the designated application form (Part 1 and Part 2) is not used or the template form has been altered in any way
  - the application form (Part 1) is not electronically signed
  - the 'Balance of Funds (C)' in application form (Part 2) is showing a negative figure
  - the required supporting documentation has not been attached
  - all of the required information is not submitted as one email
  - it is received after the closing date, or received after the closing time on the closing date.
- Note that Contaminated Site Remediation Fund grant payments can only be paid ***after*** funding is approved and a deed of funding has been signed by both contracting parties. Funds are not available for activities which occur before the deed is signed.

If you need help to complete the application form, refer to the *Contaminated Sites Remediation Fund Guide for Applicants 2018* in the first instance. For any further information, email CSRFapplication@mfe.govt.nz.

When your application is complete

The deadline for completed application forms to be received by the Ministry is the last working day of March (Round 1) or September (Round 2), depending on the funding round. We are unable to accept late applications. We are also unable to assess incomplete applications, so it is important you provide all the required information.

Email your completed application form and supporting documentation (as required) to CSRFapplication@mfe.govt.nz (with 'CSRF application' and your organisation name in the subject line). We will only accept **one email per application** – documents submitted as multiple emails will not be accepted. There is a checklist for your use on the last page of this application form.

Once you have emailed your application, you should receive a reply to acknowledge that your application has been received. If you have not received a reply within one working day please call us to let us know. Rarely emails can be blocked without notification to either party and we do not want to miss your application.

Eligibility criteria

Applications to the Contaminated Sites Remediation Fund must be able to answer 'yes' to each of the eligibility criteria below. The following self-assessment checklist is based on the fund criteria. If you cannot meet these criteria, you are not eligible to apply to the Contaminated Sites Remediation Fund.

Note that meeting the eligibility criteria does not guarantee that your project will be funded. If you have any queries about the eligibility criteria please, email CSRF@mfe.govt.nz.

Contaminated sites that are on Crown land, where Crown has accepted responsibility for the contamination, are not eligible for the CSRF.

Self-assessment checklist

	Does your project meet the following criteria?		Yes / No
1	The application (Part 1 and Part 2) is complete and all supporting information has been provided.		Yes
2	Did site contamination occur **before** the RMA (1991)? *(if **NO**, move to question 3)*		Yes
3	Did site contamination occur **after** the RMA (1991) was enacted, but no enforcement action could be undertaken by regional councils, unitary authorities, or territorial authorities to investigate and/or remediate the contamination **AND** the activities that caused the contamination have since stopped?		No
4	Has the appropriate site investigation(s) been undertaken for the project phase that is being applied for? *Note: reports must be completed in accordance with Contaminated Land Management Guidelines 1 and/or 5 and attached as supporting information to this application.*		Yes
5	The funding application is for one (or more) of the following phases of work:		
	Phase	*Required supporting evidence:*	*Select all that apply:*
	Phase 2 – Detailed Site Investigation	*Preliminary Site Investigation*	☐
	Phase 3 – Remedial Planning	*Above, plus Detailed Site Investigation*	☐
	Phase 4 – Site Remediation	*Above, plus Assessment of Remedial Options and Remedial Action Plan.*	☒
6	Funding is only requested for the years in which the site investigation, remedial planning, and/or site remediation will be undertaken.		Yes
7	The applicant is a regional council or unitary authority.		Yes

Assessment criteria

Projects are measured against assessment criteria. The assessment panel reviews, scores and assesses applications that meet the eligibility criteria by determining the extent to which and how well the project demonstrates it meets the assessment criteria.

Some projects may be recommended for funding without conditions. Some projects may be recommended for funding for less than the requested amount, and/or with specific conditions of funding attached.

Assessment criteria		
1	Partnerships	Is there a demonstrated partnership between the regional council and other interested parties?
2	Human Health and Environmental Risks	Does the site pose (or potentially pose) significant risk to human health or to the environment? *Note this should be demonstrated through the supporting documents.*
3	Project Management	Has the project manager and/or regional council: • Demonstrated their project management expertise using best practice project management methodologies and tools • Established appropriate project management structures • Demonstrated capability to undertake the project (including the practicality and feasibility of the proposed actions)?
4	Priority	Does the site hold a ranking on the CSRF Priority List?
5	Responsibility	Does funding reflect the responsibility for the contamination? Does the landowner/occupier's contribution towards the project costs reflect their degree of responsibility for contaminating the site (fully or partially)?
6	External Funding	Do contributions from other parties reflect on their ability and/or willingness to contribute to the project?

SECTION A: Applicant details

See pages 13 and 14 of the Guide for Applicants 2018 for information on how to complete this section.

1. Regional Council details

Regional Council legal name	Canterbury Regional Council
Trading name (if different)	Environment Canterbury
Physical address *Include post code.*	200 Tuam Street Christchurch Central Christchurch 8011
Postal address *Include post code.*	PO Box 345 Christchurch 8140
Telephone	03 365 3828
Website address	ecan.govt.nz

2. Contact details for this application

Primary contact name	Conor Parker	Secondary contact name	Graham Aveyard
Organisation	Environment Canterbury	Organisation	Environment Canterbury
Role or job title	Senior Scientist	Role or job title	Science Team Leader – Contaminated Environmental Science and Hazards
Phone	03 365 3828 *Landline* s 9(2)(a) *Mobile*	Phone	03 365 3828 *Landline* s 9(2)(a) *Mobile*
Email address	conor.parker@ecan.govt.nz	Email address	graham.aveyard@ecan.govt.nz
Physical address *If different to above*	N/A	Physical address *If different to above*	N/A

SECTION B: Site details

See pages 15 and 16 of the Guide for Applicants 2018 for information on how to complete this section.

The following two sections should be high-level overviews, approximately 100 words per item, with detailed information provided through the supporting information (such as a Preliminary Site Investigation) attached with this application.

3. Details of your site

Site Name *What is the site commonly referred to as?*	s 9(2)(a) Landfill – s 9(2)(a)
CSRF Priority List Ranking *See: CSRF Priority List; or N/A if not listed.*	1
Has an application to the CSRF for this site been lodged previously? *If yes, provide the year and funding round. If funding was granted, provide the Deed Number.*	Yes 2017 Round 1 Deed number s 9(2)(a)
If contamination occurred ***after*** the RMA (1991) was enacted, has enforcement action been taken by the council? If yes, please provided details on what action was taken and the outcome. If no, provide details on why no enforcement action was taken.	N/A
Have the HAIL activities that caused the contamination ceased? If so, when?	X Yes ☐ No *If yes, provide details:* Filling of the site with waste material ceased prior to construction of homes in the late 1930's.
Will all, or part, of the site be sold following site works *Note: Sale of the site will trigger the Betterment Return term in the deed of funding.*	☐ Yes X No *If yes, provide details:*
What is the proposed use of the site following remediation?	Residential

Supporting information: It is a requirement to provide as supporting information to this application the most relevant site investigations correlating to the CSRF project phase you are applying for. Any supporting site investigation or remedial plan must have been completed in accordance with Contaminated Land Management Guidelines 1 and/or 5. If you do not submit the relevant supporting information, your application will not be assessed for funding. Refer to page 22 of the *Guide for Applicants 2018* for further information.

4. Site and Landowner Details

Complete the following table. If the landowner and site occupier for one piece of land are different, use two rows and 'as above' where information is doubled up such as the address and legal description.

See page 27 of the Guide for Applicants 2018 for information on how to complete this question.

Address	**Legal Description**	**Landowner/ Occupier's Legal Name** *Include trading name, if different*	**Contact Person**	**Phone number & Email**	**Relationship to site** *landowner, occupier, other (please specify)*	**What year was the site purchased?**	**Was the landowner aware of the contamination when the site was purchased?** *(Y/N)*
[redacted]	[redacted]	s 9(2)(a)	[redacted]	[redacted]	Landowner	2016	Y

SECTION C: Project details

See pages 15 and 16 of the Guide for Applications 2018.

5. Project overview

Project Name	s 9(2)(a) Landfill
CSRF Phase *(Delete non-applicable phases as required)*	Phase 4 – Remediation
How many years are you seeking funding for?	1
Total project cost	s 9(2)(b)(ii) *What is the cash cost (exclusive of GST) of your project, including Contaminated Sites Remediation Fund funding, external funding, and your organisation's contribution?* ***This does not include in-kind costs, please indicate these costs below.***
Contaminated Sites Remediation Fund contribution	s 9(2)(b)(ii) *How much funding (exclusive of GST) are you requesting from the Contaminated Sites Remediation Fund?* *Projects that are contributing at least 50% of project costs are looked upon more favourably by the CSRF Assessment Panel*
In-kind Contribution *In-kind contributions include project management and monitoring. Roughly 10% of total project costs are considered a standard in-kind contribution.*	s 9(2)(b)(ii) *If you required a higher percentage of in-kind contribution, please outline the reasoning, below:* N/A
Do you require any statutory or non-statutory permissions to complete the project? *For example, resource consents, planning consents, or landowner permissions?*	X Yes ☐ No *If yes, which permission(s) are required? Have you applied for these? If so, when is a decision expected (if known)?* A resource consent for soil disturbance and removal will be required from Christchurch City Council. This will not be applied for until a contract is awarded for the works. A resource consent for stormwater discharge will be required from Environment Canterbury. This will not be applied for until a contract is awarded for the works.

6. Project objectives

Provide between three and six concrete statements which describe the tangible results your project will achieve. Note that some project outcomes will be achieved over a longer timeframe, however the objectives described here must be achievable within the duration of the funding. Please ensure that:

- *objectives are SMART (Specific, Measurable, Achievable, and Realistic within the Timeframe of the project). Refer Appendix 2 (page 42) of the Guide for Applicants 2018 for more information on setting SMART objectives.*
- *all objectives are clearly defined and achievable within the duration of the funding*
- *each objective has at least one key performance indicator (KPI)*
- *successful completion of tasks and activities (question 9) will lead to achievement of the project objectives*
- *you have a clear plan for measuring, evaluating and reporting whether your project objectives have been met.*

Objective *Describe the tangible results your project is trying to achieve.*	**Key performance indicators (KPIs)** *KPIs are concise statements about key benefits of the project and how they will be achieved.*	**How will you monitor and evaluate the achievement of this objective?** *How will you measure your progress and demonstrate that the objective has been achieved?*	**Baseline information** *Describe the current situation, using the data you have available.*	**Expected outcome** *What is the expected benefit from this objective being met? How does this contribute to the purpose of your project?*
The remediation of s 9(2)(a) is undertaken in a manner that minimises any risk from the contaminants present to site workers and owner/occupiers.	The health and safety of site users is maintained by all works being undertaken in accordance with the site health and safety plan.	A Site Health Safety and Environment Plan is submitted by the contractor prior to works. An accident register is available to site workers to record any incidents. Corrective action is taken when an issue is identified.	Property owners have site management plans for current use of their land.	The health and safety of workers and occupants is protected.
s 9(2)(a) being regarded as at least 'managed for residential land use'.	The affected property is able to be used with limited restrictions for regular tasks after replacement/covering of contaminated fill material.	The property included in this application is categorised on Environment Canterbury's Listed Land Use Register as "Managed for Residential Land Use" based on evaluation of completion reports in accordance with CLMG 1 and 5.	The property is currently regarded as "contaminated for residential land use" and are categorised as such on the Listed Land Use Register.	The affected property is able to be used with limited restrictions for regular tasks. The long-term health and wellbeing of residents is protected from fill material.

The remediation of s 9(2)(a) is done in a way that is acceptable to current owners and realistically usable by future owners.	Trust from the community is maintained or improved in local and national organisations, and The affected property can be used with limited restrictions for regular tasks, by Using excellent consultation with residents prior to site works and regular communication during site works.	A minimal number of complaints from residents and no withdrawal from the project by current owners.	An assessment of remediation options has been made and consultation with owners' on what option is preferred for how they use their property.	Residents will be satisfied with the project and have confidence in the organisations involved to act in the residents' interest.
Develop and maintain relationships between Christchurch City Council, Environment Canterbury, and Canterbury District Health Board in order to coordinate responses for community wide issues.	Contacts between the organisations are improved and more efficient responses can be made for similar situations using regular meetings and communications documenting progress and key learnings during this project.	Regular meetings and updates will be recorded. An assessment of 'lessons learned' made at the end of the project.	Christchurch City Council, Environment Canterbury, and Canterbury District Health Board have been making a cooperative and coordinated effort since 2016 at s 9(2)(a) Landfill.	Christchurch City Council, Environment Canterbury, and Canterbury District Health Board will have more efficient responses to similar situations.

7. What environmental, social, cultural and economic benefits will occur as a result of this project?

Please outline the economic, environmental, social and/or cultural benefits that will result from the completion of your project. Project benefits may be achieved outside the life of the CSRF funding. Add more rows if required.

See pages 24-25 of the Guide for Applicants 2018 for information on how to complete this question.

Examples include:

- *Environmental - eg, reduction of harm to the environment, improved environmental values*
- *Social - eg, human health, enhanced public safety, improved aesthetics and amenities*
- *Cultural - eg, enhanced cultural awareness/kaitiakitanga,*
- *Economic - eg, future monetary benefits from the remediation of the site*
- *Sustainability - eg, sustainable remedial options to reduce waste to landfill*

Type of benefit	Description
Environmental	• A reduction in the volume of contaminated fill material at the location will have reduced effect on groundwater from the fill material. • Plants and wildlife across 16 properties will be separated from contaminated fill material.
Social	• The risks to human health will be considered to be managed because a physical barrier will prevent human exposure to contaminated soil at depth. • Site users will be able to use and visit the affected properties with few limitations.
Economic	• The value of properties will be increased to that prior to knowledge of contamination. • The financial burden of remediation will not be passed on to future site users.
Sustainability	The site will be remediated in a way that requires little ongoing maintenance.

8. Risk management

Provide a brief description of the major risks to the project achieving the intended outcomes. Include consideration of potential barriers that may pose a risk to the success of the project. Where possible give an indication of the likelihood and significance of the risk and any mitigation strategies to be included in the project.*

*See page 26 of the Guide for Applicants 2018 for information on how to complete this question. *Risks to human health and the environment should be outlined in the supporting documents*

Potential risk *Identify the potential risk to your project (for example, project not completed on time, unpredictable events such as weather, lack of resource commitment, time and cost estimates too optimistic, unexpected budget cuts, stakeholders changing requirements after the project has started, risks to the industry or sector to which the organisation belongs).*	**Level of risk** *Low, medium or high.*	**Impact on project** *Describe the impact the risk would have on the project (for example, misunderstandings, duplication of work, incomplete work).*	**Consequence on project** *Minor, moderate or severe.*	**Strategy to mitigate** *Describe the process you will use to minimise and manage the risk (for example, project manager monitors functional roles to ensure enough time is allocated to complete each task/activity and the project as a whole).*
Project not completed on time	Medium	Loss of confidence by the community in organisation's abilities and increased costs.	Moderate	Consultant project manager sets and monitors an expected timeline of stages of works. Excellent communication with landowners.
Project not completed on budget	Medium	Incomplete work	Severe	An assessment of cost had been made in the assessment of remedial options. The project is put to competitive tender with clear requirements and targets.
Property owners change requirements after the project has started	Low	Incomplete work	Moderate	Excellent communication and individual property works plans made with site owners prior to works.
Property sold during project	Low	Incomplete work	Minor	Transfer landowner names on the Deed of Funding. Maintain the Listed Land Use Register to ensure

				potential new owners of the current issues.
Media interest	Medium	Slowed work	Moderate	A communications plan currently exists with messaging to present to media. We will not initiate contact with media (e.g. media releases, website updates). Good relations to be maintained with land owners and the community.
Neighbourhood objections to works	Medium	Slowed work	Moderate	Contractor to ensure that affected properties and neighbours are informed of what is happening and timelines prior to work. All properties surrounding s 9(2)(a) are similarly affected.
Site access is not coordinated	Medium	Slowed or duplicat on of work resulting in higher cos s.	Moderate	Consultant Project Manager and contractors coordinate access and works across properties in a planned timeline.

SECTION C: Resources, capability and partnerships

See pages 27-29 of the Guide for Applicants 2018 for information on how to complete this section.

9. Project team including contractors

You must be able to demonstrate that the project will engage personnel with the required technical, project management, and financial management skills to successfully deliver the project. Provide details of your proposed project team and confirmation of their availability for the duration of the project. Note that it is mandatory to provide details of your project manager.

See page 27 of the Guide for Applicants 2018 for information on how to complete this question.

Name	Organisation	Role in project	Confirmed	Phone	Email
Conor Parker	Environment Canterbury	Project manager *Note that you **must** provide a copy of the project manager's CV or job description of project manager as part of your application.*	Yes	027 839 0101	conor.parker@ecan.govt.nz

If the application is successful, a consultant will be engaged to manage the project in accordance with Environment Canterbury's Procurement and Contract Management Strategy. A procurement plan will be produced and consultants engaged for tendering through TenderLink or GETS in an open competitive procurement method. The Ministry for the Environment will be informed of the successful applicant and their details provided.

10. Governance and management structure

See page 28 of the Guide for Applicants 2018 for information on how to complete this question.

Project governance *Describe the governance structure/s that will be implemented to ensure monitoring and management of performance and effective decision-making occurs. Include information on members of the governance group and their skills.*	Project Sponsor – Stefanie Rixecker (Director Science) Project Lead – Graham Aveyard (Team Leader Contaminated Land, Environmental Science and Hazards) Project Manager – Conor Parker (Senior Scientist) Consultant – TBA Regular (weekly or fortnightly) meetings will occur between the Project Manager and the Consultant. The Ministry for the Environment will be provided weekly updates of progress and issues.
Managing funds *Provide information about how you will manage the project funds if your application is successful. Include information about how you will procure goods and services, approve payments, and monitor and address budget overspend.*	Environment Canterbury have a robust competitive procurement process for projects/expenses valued over s 9(2)(b)(ii). An open tender will be made following the development of a procurement plan that provides specifications of the contract, timelines, and evaluation criteria to compare competing bids. The contract will be awarded for a fixed dollar amount. Any variation from this will require a written variation of contract with Environment Canterbury. Regular (weekly/fortnightly) meetings will take place with the contract manager to report on progress and to identify issues regarding costs and time.

11. Partnerships

See page 29 of the Guide for Applicants 2018 for information on how to complete this question.

Is the current landowner(s) (or guarantor) willing to contribute financially to the project *Note, due diligence may be required to be undertaken on the landowner if application is successful.*	☐ Yes ✓ No *If no, is the landowner willing to support the project in other ways?* No other support is provided.
Which individual organisations will be involved in the project *List the name of the organisation and details of their involvement*	Environment Canterbury Christchurch City Council Community and Public Health CDHB
Who are the projects key stakeholders *List the name of the stakeholders and details of their interest in the project*	• The current landowner and neighbouring properties. • Environment Canterbury are the organisation responsible for making the CSRF application and monitoring contaminated land in Canterbury. • Christchurch City Council are responsible for administering the NES for Assessing and Managing Contaminants in Soil to Protect Human Health and land use within Christchurch City.

12. Health and safety

It is important that you have the necessary health and safety policies, resources and expertise to safely undertake and complete the project. You must comply at all times with the requirements and provisions of the Health and Safety at Work Act 2015 (HSWA). You will be asked to submit a health and safety plan for your project if you are invited to proceed to Stage 2. See page 28 of the Guide for Applicants 2018 for information on how to complete this question.

Does your organisation have a health and safety policy?	✓ Yes ☐ No *If yes, state when this was last reviewed/updated.* 2014
Has your organisation or any other parties involved been issued with any notices under health and safety legislation?	☐ Yes ✓ No *If yes, please provide details.*
Who will be responsible for health and safety for the project?	Health and Safety will be the responsibility of the consultant that performs the works required at s 9(2)(a) A Health and Safety Plan will be provided by the consultant and approved by Environment Canterbury before the start of works. This document will be supplied to the CSRF.

SECTION D: Additional information

See pages 30-31 of the Guide to Applicants 2018 for information on how to complete this section.

13. Conflicts of interest

Describe any known conflicts of interest (actual or potential) and steps you will take to manage them. Before completing this section, see page 30 of the Guide for Applicants 2018.

14. Is there anything else we need to consider about your application?

Provide any additional information you or your organisation considers important, but has not been covered in previous questions in this application form. (maximum 400 words)

- s 9(2)(a) is considered to be an integral part of the wider project at s 9(2)(a) in terms of time and cost due to the savings that could be made with a coordinated effort.
- The owner paid s 9(2)(a) s 9(2)(a)) on 01 December 2016.
- The land owner is not in a financial position to provide funds for remediation (see attached letter). Environment Canterbury and Christchurch City Council have made substantial contributions to investigations of the landfill and in-kind with time. As a result, 100% funding is being requested for the project.

Declaration

This declaration must be completed by a person with the organisation's signing authority. See page 31 of the Guide for Applicants 2018 for additional information on how to complete this question.

***Important:** Please contact the Ministry if you have any queries about the terms and conditions of the deed of funding for the Contaminated Sites Remediation Fund.*

As a duly authorised representative of the organisation as per Section A of this Contaminated Sites Remediation Fund application form:

- I declare that my project meets all of the eligibility criteria for the Contaminated Sites Remediation Fund (*see page 4 of this application form*).
- I declare that to the best of my knowledge, the information contained in all sections of this application form, or supplied by us in support of our application, is complete, true and correct.
- I declare that I have the authority to sign this application form and to provide this information.
- I declare that the application is not being made by an organisation that is in receivership or liquidation, or by an undischarged bankrupt.
- I declare that I have provided information about any actual or potential conflicts of interest (in question 13) and that I will promptly inform the Ministry for the Environment of any such conflicts if they arise subsequent to the submission of this application.
- I understand that information presented to the Minister for the Environment and Ministry for the Environment is subject to disclosure under the Official Information Act 1982, other legislation, court orders, and in response to Parliamentary questions.
- I understand my rights in accordance with the Privacy Act 1993.
- I agree that the Ministry for the Environment can undertake, for the purpose of assessing eligibility and suitability for Contaminated Sites Remediation Fund funding, a background check on the applicant(s), including but not limited to credit checks, criminal record checks, and reference checks from other parties, and may liaise with local and national organisations about this application.
- I understand that if I receive an invitation to proceed to Stage 2 of the funding process this is not a confirmation of funding, and that the final decision is subject to a successful completion of Stage 2.

Name		
Position		
Signature *By typing your name in the space provided you are electronically signing this application form.*		Date

Checklist

Use the following checklist to confirm you have provided all the required information in your application.

Do not include any attachments that the Ministry has not specifically requested. These will not be provided to the assessment panel.

- ☐ All sections of this Application Form (Part 1) have been completed (using 'N/A' or 'none' if required).
- ☐ All sections of this Application Form (Part 2) have been completed (using a zero if required).
- ☐ All $ figures provided in Application Form (Part 1) and (Part 2) add up and are consistent throughout the application.
- ☐ Declaration on the Application Form (Part 1) has been electronically signed and dated.
- ☐ Letters confirming co-funding for your project from each organisation listed as 'external funding sources' in Application Form (Part 2).
- ☐ **Supporting Documents – you must include the appropriate site investigation/remedial plan/etc** in support of your application depending on what project phase you are applying for.
- ☐ Application form, project budget, and any supporting information will be submitted as **one email only**. (Documents submitted as multiple emails will **not** be accepted.)
- ☐ Application form, project budget, and any supporting information will be submitted no later than **5:00 pm** on the **last working day of March or September**.

GEOSCIENCE
A proud partner of ENGEO

Southern Response
C/- Arrow International (NZ) Ltd

3 November 2014

RE: Environmental Soil Investigation at s 9(2)(a), Christchurch (D3423475)

1 Introduction

Geoscience Consulting (NZ) Ltd (Geoscience) was requested by Arrow International (NZ) Ltd (Arrow) to undertake an intrusive soil investigation at the above property (herein referred to as "the site") as part of the Southern Response Project. The Ministry for the Environment (MfE) has produced the Hazardous Activities and Industries List (HAIL)[1] which documents activities and industries which have the potential to contaminate land. We understand the site has been identified as potentially having a historic hazardous activity or industry undertaken on it.

2 Objective

The objective of this environmental assessment is to provide information on the soil concentrations of contaminants of concern (CoC) present onsite, a comparison of the concentrations against applicable standards and a recommendation for the potential disposal/management options relating to the sites proposed redevelopment.

Please note this report is for redevelopment purposes only and does not seek to provide a full characterisation of soil concentrations across the whole site.

3 Site Information

Table 1: Summary of Site Description

Item	Description
Location:	s 9(2)(a) Christchurch
Legal Description:	s 9(2)(a)
Current Site Use:	Residential
Proposed Site Use:	Residential
Site Area:	746 m^2
Geology[2]:	Dominantly alluvial sand and silt overbank deposits
Identified HAIL activities:	G3 – Landfill sites

Geoscience Consulting (NZ) Limited
124 Montreal Street, Christchurch 8023, New Zealand
PO Box 373, Christchurch 8140, New Zealand
T (+64) (3) 328 9012 F (+64) (3) 328 9013
www.nzgeoscience.co.nz

ACENZ

4 Potential Issues

During the geotechnical investigation at the site, unidentified fill material was encountered. The MfE provides a list of substances typically associated with the individual HAIL activities or industries[1]. Using this a guide, Geoscience recommended that soil samples at the site were collected and analysed for CoC typically associated with unidentified fill sites. This includes heavy metals (As, Cd, Cr, Cu, Pb, Ni and Zn), and polycyclic aromatic hydrocarbons (PAHs). The analytical results have been used to provide an assessment of the potential risk to human health from the aforementioned CoC and the suitability of the land for the proposed land use (residential).

The potential for ground gas associated with the former landfill in the subsurface at the Site has not been assessed as part of this assessment but is considered unlikely to be an issue as no filling activities at the site can be identified in the historic aerial photographs for the area. No putrescible material was identified in the soils sampled during this investigation.

5 Site Investigation

Geoscience visited the site on the 8 September 2014 and undertook soil sampling. The environmental investigation comprised:

- Collection of four samples from 0.3 to 1.9 m below ground level (bgl). The depth was considered suitable to provide a representative indication of contaminant concentrations that workers could come into contact with during foundation excavations. The sample depths are also considered suitable for the assessment of the future risk to human health from the CoC through the potentially completed pathways present, including dermal contact and accidental ingestion of soil. The samples were also considered suitable to assess disposal options for the excavated material (if any). All samples were submitted to R J Hill Laboratories (Hills) with one composite requested to be made from the four samples;
- Analysis of the one composite soil sample for a suite of common heavy metals (As, Cd, Cu, Cr, Ni, Pb and Zn) and PAHs.

All fieldwork was carried out following Geoscience standard operating procedures for the appropriate field assessments and handling of potentially contaminated soils, including:

- Each soil sample was assessed for visual and olfactory indicators of contamination;
- The samples were collected from 0.3 to 1.9 m bgl by a trained and experienced technician using a hand auger. The soil was compressed directly into laboratory supplied containers by the field technicians using a new pair of nitrile gloves for each sample;
- Prior to sampling, equipment was decontaminated using a triple wash procedure with Decon 90 solution, potable water and deionised water; and
- Following collection, all samples were placed directly into a chilly bin prior to transport, under standard Geoscience chain of custody procedures, to Hills for analysis.

6 Adopted Investigation Criteria

The specific criteria referenced in this report have been selected in accordance with The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011[3] (herein referred to as the NES) and the MfE (2011) Contaminated Land Management Guidelines No.2 – Hierarchy and Application in New Zealand of Environmental Guideline Values[4].

Soil Contaminant Standards (SCSs) or other appropriate criteria for Residential land use, with an anticipated ingestion of 10% produce grown on the site, have been selected considering the current and proposed end use of the site. Criteria for Maintenance / Excavation activities have also been presented to assess the risks to human health during redevelopment earthworks and for future maintenance of underground services.

Where appropriate, the standard NES criteria were adjusted according to the requirements for composite samples specified in the MfE (2011) *Contaminated Land Management Guidelines No.5 – Site Investigation and Analysis of Soils*[5]. As the composite sample consisted of four sub-samples, the guideline criteria were divided by four to result in the adjusted criteria for the composite sample used in this investigation.

To enable disposal of the soil at Christchurch City Council (CCC) Burwood Landfill, contaminant concentrations must be below the NES Recreational land use criteria. These criteria have not been adjusted as the composite sample results provide an indication of the average contaminant concentrations.

The soil analysis results have also been compared to Regional Background concentrations for heavy metals. These provide information into the possible disposal options at a clean-fill facility. These criteria have not been adjusted as the composite sample results provide an indication of the average contaminant concentrations.

7 Results

No olfactory indicators of contamination were noted in the samples. The surface soil encountered is described in Table 2:

Table 2: Summary of Typical Subsurface Conditions

Depth (m)	Material Type
0.0-0.2	Sandy SILT with trace gravel and rootlets; brown.
0.2-2.0	Fine to medium SAND with some gravel, trace silt, brick, shells, glass, concrete, metal, wood and charcoal; dark brown.
2.0-2.2	SILT with trace organics; dark grey.

Table 3 compares the concentrations of heavy metals and PAHs with the applicable and available contaminants standards for Residential land use and Maintenance / Excavation workers (both

adjusted for composite sample), as well as unadjusted criteria for Recreational land use and Regional Background concentrations (as described in Section 6). Full analytical results are appended in Attachment 2.

Table 3: Composite Sample Laboratory Test Results

Sample Name	S1	Soil Contaminant Standards Residential Land use ALL PATHWAYS[a] (Adjusted)	Soil Contaminant Standards Recreational Land use[a]	Soil Contaminant Standards Maintenance / excavation workers[a] (Adjusted)	Trace Elements (Level 1)[b]	Trace Elements (Level 2)[b]
Soil Type	SAND					
Sample Depth, m	0.3-1.3					
Heavy Metals in soil, mg/kg						
Arsenic	**35**	5	80	17.5	15.3	16.3
Cadmium[d]	**6.0**	0.75	400	325	0.2	0.2
Chromium[e]	41	115	2,700	1,575	19	20.1
Copper	430	>2,500	>10,000	>2,500	17.7	19.5
Lead	***9,400***	52.5	880	825	101	128.8
Nickel	51	100[c]	1,200[c]	-	16.6	18
Zinc	250	1,850[c]	30,000[c]	-	149	166.8
Polycyclic Aromatic Hydrocarbons in soil, mg/kg						
ΣBaP[f]	**14.4**	2.5	40	8.75	0.922[g]	0.922[g]

Notes:
[a] Adjusted MfE, 2012 SCSs[3]:
Bold text indicates that the concentration exceeds the Residential land use SCS.
Italics indicates that the concentration exceeds the Recreational land use SCS.
Underlined text indicates that the concentration exceeds the Maintenance / Excavation SCSs.
[b] ECan (2007) Background Concentrations of Selected Trace Elements in Canterbury Soils[6] Exceedances are shaded
[c] Guideline on the Investigation Levels for Soils and Groundwater[7]; Health Investigation Level for 'Standard Residential' land use.
[d] Assumes soil pH of 5.
[e] Criteria for Chromium VI were conservatively selected.
[f] Risk associated with a mixture of carcinogenic PAH's is based on the Benzo(a)pyrene equivalent (BaP Eq.) concentration. The BaP Eq. concentration was calculated according to the NES *Methodology* [8].
[g] ECan (2007) Background Concentrations of Polycyclic Aromatic Hydrocarbons in Christchurch Urban Soils[9] Exceedances are shaded.

Table 3 shows that arsenic, cadmium, lead and ΣBaP were present in concentrations exceeding the adjusted Residential land use criteria. Therefore, the individual soil samples (of the composite sample) were analysed for arsenic, cadmium, lead and ΣBaP concentrations. Arsenic, lead and ΣBaP also exceeded the adjusted criteria for Maintenance/Excavation criteria. The lead concentration exceeded the unadjusted criteria for Recreational land use. No other exceedances of the SCSs were observed.

The soil analysis results were compared to Regional Background criteria with all of the contaminants analysed exceeding the site specific criteria.

Table 4: Sample Laboratory Test Results

Sample Name	HA01	HA02	HA03	HA04	Average	Soil Contaminant Standards Residential Land use ALL PATHWAYS[a]	Soil Contaminant Standards Recreational Land use[a]	Soil Contaminant Standards Maintenance / excavation workers[a]	Trace Elements (Level 1)[b]	Trace Elements (Level 2)[b]
Soil Type	SAND	SAND	SAND	SAND	-					
Sample Depth, m	0.3-1.3	0.3-1.3	0.3-1.3	0.3-1.3	-					
Heavy Metals in soil, mg/kg										
Arsenic	**43**	13	**23**	**57**	**34**	20	80	70	15.3	16.3
Cadmium[c]	**14.2**	1.71	0.83	**5.5**	**5.56**	3	400	1,300	0.2	0.2
Lead	***8,900***	***1,600***	***3,000***	***1,790***	***3,822.5***	210	880	3,300	101	128.8
Polycyclic Aromatic Hydrocarbons in soil, mg/kg										
ΣBaP[d]	**19.83**	***52.83***	4.42	3.29	**20.09**	10	40	35	0.922[e]	0.922[e]

Notes:
[a] MfE, 2012 SCSs[3]:
Bold text indicates that the concentration exceeds the Residential land use SCS.
Italics indicates that the concentration exceeds the Recreational land use SCS.
Underlined text indicates that the concentration exceeds the Maintenance / Excavation SCSs.
[b] ECan (2007) Background Concentrations of Selected Trace Elements in Canterbury Soils[6] Exceedances are shaded
[c] Assumes soil pH of 5.
[d] Risk associated with a mixture of carcinogenic PAH's is based on the Benzo(a)pyrene equivalent (BaP Eq.) concentration. The BaP Eq. concentration was calculated according to the NES *Methodology*[3]
[e] ECan (2007) Background Concentrations of Polycyclic Aromatic Hydrocarbons in Christchurch Urban Soils[9] Exceedances are shaded.

Table 4 shows that arsenic, cadmium, lead and ΣBaP are still present in concentrations above the unadjusted Residential guideline criteria. Lead and ΣBaP were also present in concentrations above the unadjusted Recreational and Maintenance/Excavation worker criteria.

The soil analysis results were compared to Regional Background criteria with all of the contaminants exceeding the site specific criteria.

8 Conceptual Site Model

A conceptual site model consists of three primary components. For a contaminant to be a risk, all three components are required to be present and connected. For the potential risk to be determined each component is required to be assessed. The three components of a conceptual site model are:

- Source of contamination;

- Pathway in which contamination could potentially mobilise along; and
- Sensitive receptors which may be impacted by the contamination.

Table 5: Conceptual Site Model

Source	Pathway	Receptor
Fill material	Direct contact; Ingestion of soil, surface water / groundwater; Inhalation of windblown dust.	Future residents/site workers. Surrounding residents and environment.
Risk of contamination presenting a significant risk to human health	High – arsenic, cadmium, lead and ΣBaP above the Residential land use criteria. Lead and ΣBaP also above the maintenance/excavation worker criteria and recreational criteria.	

The risk of contamination at the site presenting a significant risk to human health of the construction/excavation workers and future residential land users is considered high due to soil concentrations exceeding the applicable soil contaminant standards.

9 Conclusions and Recommendations

Table 5: Summary of Associated Risks

Item	Risk Category
Site Management Plan	Global Consent SMP Category C
Site Workers	High – Lead and ΣBaP above guideline criteria
Waste Disposal Location	Kate Valley – will need further testing
Regional Background Concentration	Above background criteria for all contaminants tested
Future Residents	High – arsenic, cadmium, lead and ΣBaP above guideline criteria

The soil analysis results show that arsenic, cadmium, lead and ΣBaP were present in concentrations exceeding the Residential land use SCS. Lead and ΣBaP were also present in concentrations exceeding the Maintenance / Excavation criteria. Therefore, a complete exposure pathway exists between the impacted area and the site end users and the site redevelopment workers. To minimise the impacts on the site workers, the surrounding population and environment, mitigation measures should be outlined in a redevelopment Site Management Plan (SMP).

During the redevelopment at the site, the volume of soil disturbance needs to be checked to determine if the NES is triggered. The triggering of the NES is dependent on the final foundation design for the site and may require additional consent to be applied for.

The soil analysis results were compared to Regional Background criteria with all of the contaminants tested exceeding the site specific criteria for the site. It is therefore considered that material excavated from the site is not suitable for cleanfill disposal.

The soil concentrations returned were above the Recreational land use criteria for lead and ΣBaP, and are therefore not suitable for disposal at Burwood Landfill. Further analysis of the material onsite is required for disposal at Kate Valley landfill.

Under the Global Consent[10] for work completed on sites identified on the LLUR, this site would be classed as Category C, high risk and work should be undertaken under the appropriate Site Management Plan (SMP).

As part of the works the homeowner may wish to also include remediation of the soils in the garden areas of the site. Risk from these soils comes from direct contact and the potential ingestion (mainly from soil attached to vegetables, children eating the soil, etc) of the soil over a long period of time. By removing the potential contact with the soils you can manage the risks. Remediation could involve the placement of hardstanding over the impacted soils (patio, pathway, etc), the removal of the top soil and replacement or the building up of flower / vegetable beds and the placement of clean soil within those areas.

As the samples analysed were a composite, the laboratory analysis results provide an average for the soil that may be excavated from the site. Hot spots of contamination may exist at the site and the SMP for the site should outline procedures to identify and mitigate any exposure to those areas (if any) during the redevelopment works.

Site occupants also should be informed of the potential for contamination in the underlying soil and potential long term impacts from the material and the potential options available to manage the risk from the impacted soils.

10 References

1 MfE Oct 2011: Ministry for the Environment Hazardous Activities and Industries List.

2 Forsyth, P.J.; Barrell, D.J.A; Jongens, R. 2008: Sheet 16 - Geology of the Christchurch Area 1:250 000. Institute of Geological and Nuclear Sciences, Lower Hutt.

3 MfE 2012: *Users' guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.*

4 MfE 2011: *Contaminated Land Management Guidelines No.2: Hierarchy and Application in New Zealand of Environmental Guideline Values.*

5 MfE 2011: *Contaminated Land Management Guidelines No.5: Site Investigation and Analysis of Soils*.

6 ECan (2007) Background Concentrations of Selected Trace Elements in Canterbury Soils. Addendum 1: Additional Samples and Timaru Specific Background Levels. Report prepared for Environment Canterbury by Tonkin & Taylor Limited, Christchurch, New Zealand. Report Number R07/1/2. Tonkin & Taylor Reference: 50875.003.

7 National Environmental Protection Council 1999: *National Environment Protection Measure Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater*.
8 MfE 2011: *Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health.*
9 ECan (2007) Background Concentrations of Polycyclic Aromatic Hydrocarbons in Christchurch Urban Soils. Report prepared for Environment Canterbury by Tonkin & Taylor Limited, Christchurch, New Zealand. Report Number: R07/19. Tonkin & Taylor Reference: 50875.004.
10 Christchurch City Council 2014: *Resource Consent No. RMA92026024 Global land use consent for soil disturbance associated with the rebuild and repair of earthquake-damaged residential structures on HAIL land.*

11 Limitations

i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Arrow International (NZ) Ltd, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site inspections and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the Client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it must be appreciated that actual conditions could vary from the assumed model.

iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

iv. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on 03 328 9012 if you require any further information.

For and on behalf of Geoscience Consulting (NZ) Ltd,

Hazel Atkins

Engineering/Environmental Geologist

David Robotham, CEnvP

Associate Environmental Constultant

Attachments:

- Site Location Plan

- Laboratory Analysis Results

2

s 9(2)(a)

⊕ = Test Location

Note: All images sourced from Google Maps

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Date	Nov-14	**Client**	**Southern Response c/- Arrow International NZ Ltd**		
Drawn by	HA	**Project**	s 9(2)(a) **Christchurch**		
Approved by	DR	**Description**	**Site Location Plan**		
Scale	NTS	**Geoscience Ref.**	9653.002.516	**Client Ref.**	D3423475

19-D-02771

Hill Laboratories
BETTER TESTING BETTER RESULTS

R J Hill Laboratories Limited
1 Clyde Street
Private Bag 3205
Hamilton 3240, New Zealand

Tel +64 7 858 2000
Fax +64 7 858 2001
Email mail@hill-labs.co.nz
Web www.hill-labs.co.nz

ANALYSIS REPORT

Client:	Geoscience Consulting (NZ) Limited	**Lab No:**	1323143 SPv2
Contact:	Gareth Oddy	**Date Registered:**	09-Sep-2014
	C/- Geoscience Consulting (NZ) Limited	**Date Reported:**	24-Sep-2014
	PO Box 373	**Quote No:**	53616
	CHRISTCHURCH 8140	**Order No:**	
		Client Reference:	s 9(2)(a)
		Submitted By:	H Atkins

Amended Report

This report replaces an earlier report issued on the 16 Sep 2014 at 2:59 pm
Arsenic, cadmium, lead and PAH screen added to the individual samples, at clients request.

Sample Type: Soil

Sample Name:		HA01_S1@0.8m 08-Sep-2014 2:30 pm	HA02_S1@0.8m 08-Sep-2014 2:30 pm	HA03_S1@0.3m 08-Sep-2014 2:35 pm	HA04_S1@1.9m 08-Sep-2014 2:30 pm	Composite of HA01_S1@0.8m + HA02_S1@0.8m + HA03_S1@0.3m + HA04_S1@1.9m
Lab Number:		1323143.1	1323143.2	1323143.3	1323143.4	1323143.5
Individual Tests						
Dry Matter	g/100g as rcvd	79	82	83	75	80
Total Recoverable Arsenic	mg/kg dry wt	43	13	23	57	-
Total Recoverable Cadmium	mg/kg dry wt	14.2	1.71	0.83	5.5	-
Total Recoverable Lead	mg/kg dry wt	8,900	1,600	3,000	1,790	-
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	-	-	-	-	35
Total Recoverable Cadmium	mg/kg dry wt	-	-	-	-	6.0
Total Recoverable Chromium	mg/kg dry wt	-	-	-	-	41
Total Recoverable Copper	mg/kg dry wt	-	-	-	-	430
Total Recoverable Lead	mg/kg dry wt	-	-	-	-	9,400
Total Recoverable Nickel	mg/kg dry wt	-	-	-	-	51
Total Recoverable Zinc	mg/kg dry wt	-	-	-	-	2,500
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	0.16	0.41	0.03	< 0.03	0.14
Acenaphthylene	mg/kg dry wt	1.08	3.1	0.23	0.19	1.19
Anthracene	mg/kg dry wt	1.78	5.5	0.36	0.21	1.61
Benzo[a]anthracene	mg/kg dry wt	11.8	32	2.4	1.62	7.5
Benzo[a]pyrene (BAP)	mg/kg dry wt	13.2	36	3.0	2 2	9.9
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	14.4	33	2.7	2.7	11.9
Benzo[g,h,i]perylene	mg/kg dry wt	9.5	29	2.2	1.74	7.1
Benzo[k]fluoranthene	mg/kg dry wt	6.1	12.6	1.13	0.91	4.1
Chrysene	mg/kg dry wt	10.2	24	1.95	1.51	6.4
Dibenzo[a,h]anthracene	mg/kg dry wt	1.79	4.8	0.45	0.32	1.23
Fluoranthene	mg/kg dry wt	28	68	5.2	2.5	17.5
Fluorene	mg/kg dry wt	0.28	0.71	0.06	0.03	0.21
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	12.3	33	2.8	2.1	6.8
Naphthalene	mg/kg dry wt	0.29	0.80	< 0.13	< 0.15	0.15
Phenanthrene	mg/kg dry wt	9.6	18.7	1.75	0.60	5.6
Pyrene	mg/kg dry wt	25	65	5.1	2.4	14.9

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-5
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.10 - 4 mg/kg dry wt	5
Polycyclic Aromatic Hydrocarbons Screening in Soil	Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample. [KBIs:5786,2805,2695]	0.010 - 0.05 mg/kg dry wt	1-5
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	1-5
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1-5
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-4
Total Recoverable Arsenic	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	2 mg/kg dry wt	1-4
Total Recoverable Cadmium	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.10 mg/kg dry wt	1-4
Total Recoverable Lead	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.4 mg/kg dry wt	1-4

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

This report must not be reproduced, except in full, without the written consent of the signatory.

Ara Heron BSc (Tech)
Client Services Manager - Environmental Division

ENGEO
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GEOLOGY
GEOTECHNICAL
ENVIRONMENTAL
WATER RESOURCES

2 September 2016

Canterbury Regional Council
Attention: Team Leader Environmental Compliance
By email: ecinfo@ecan.govt.nz

Christchurch City Council
Attention: Team Leader Environmental Compliance
By email: resourceconsentapplications@ccc.govt.nz

RE: Validation Report for Works Completed at s 9(2)(a) Christchurch (Client Ref. D3423475)

1 Introduction

Under the Global Consent (CRC157521 and RMA92029513) held by Southern Response, a site validation report is required once all work has been completed at the above site. The information below provides confirmation that the soil disturbance works completed have been done as per the site management plan (SMP) which forms part of the consent requirements.

Project works were completed on 15 July 2015. Below is the information required by consent conditions (condition 20 for RMA92029513) to be included on site validation report.

2 Site Information

A summary of the site information is shown below in Table 1:

Table 1: Site Information

Item	Description
Location	s 9(2)(a) Christchurch
Legal Description	s 9(2)(a)
Contamination Risk Category	C
SMP Category	C

3 Redevelopment Plan

3.1 Site Works

The site was redeveloped with the following scope of works:

Table 2: Scope of Works

Item	Description
Site works	Rebuild including Type 4 (demolition and rebuild) foundation works
Depth of excavation	0.8 m
Volume of soil disturbance	160 m^3
Volume of soil removal	Volume of soil removal 160m^3

The areas where soil was removed and/or disturbed can be seen in Attachment 1.

3.2 Site Visits

Table 3: Site Visits

Date	Description
21-01-2015	Pre-start meeting. Contractors and home builder were made aware of the mitigation measures set out in the SMP and the controls relevant to the site. Attendees signed the meeting minutes to confirm that they understood the requirements of the site management plan.
04-02-2015	Site visit completed. Discussion with on-site contractors over areas of exclusion and decontamination zones.
18-09-2015	Site visit was completed. Ground improvement completed. No SMP issues noted.
01-12-2015	Site visit completed. House build underway, no-one present on-site during visit. No SMP issues noted.
10-08-2016	Site visit was completed. All work completed on dwelling.

No additional contamination was identified during the redevelopment works.

All works at the site have been completed and all surfaces disturbed as part of the house rebuild have been sealed or finished to the correct standard.

Photo 1: Completed redevelopment at s 9(2)(a)

Table 4: Summary of Contamination at the site

Item	Date
Type of contamination observed	Nil contamination observed during soil disturbance
Approximate depth of the contamination	Nil contamination observed during soil disturbance
Any photos of the contaminated material	N/A
Approximate location of contamination	Nil contamination observed during soil disturbance
Subsequent validation of the contamination (if undertaken)	No validation sampling completed as soils are now either capped by the redevelopment works or were outside the area of soil disturbance.

3.3 Changes from Initial Scope of Works

No additional material was removed from the site and no unforeseen ground conditions were encountered during the site redevelopment.

No complaints in relation to the Global Consent were noted during the redevelopment works.

3.4 Disposal of Soil from Site

The Global Consent documents state that soil removed from the site will be disposed of correctly to ensure that the contaminants are managed and the receiving environment is not impacted adversely. Disposal to an appropriate waste facility allows the contaminated material to be managed appropriately to prevent this occurring. CCC and CRC require that this movement of soil is tracked to provide evidence that this has occurred.

Based on the results from the initial soil sampling, the soil was considered suitable to be disposed of at Burwood Landfill. Before excavations were undertaken, a Waste Manifest was sought from CCC for disposal at Burwood Landfill. Waste disposal dockets are included in Appendix 1.

Table 5: Summary of Disposal Information

Item	Date
Company that collected the contaminated material	Bin King Limited for McMillan Drilling Civil Limited
Date of collection	19/08/2015, 20/08/2015, 21/08/2015 and 28/06/2015
Destination of material	Kate Valley Landfill
Description of material disposed of, including any known contaminates	Soil – silt/sand – arsenic, cadmium, lead and BaP eq. concentration above residential land use criteria; lead and BaP eq. above industrial / commercial outdoor worker criteria; arsenic, cadmium, chromium, copper, lead, nickel, zinc and BaP eq. above regional background criteria
Volume of material collected	70 tonnes

4 Consent Conditions

Table 6 below outlines the consent conditions for the site and whether each condition has been met.

Table 6: Summary of Disposal Information

Condition	CCC Consent No.	Criteria Met
The consent holder shall ensure that all personnel undertaking activities are made aware of and have access to the consent conditions and site management plan prior to the commencement of works, with all documentation remaining on-site.	5	**YES.** A pre-start meeting was held on-site before works commenced where the site management plan was explained. A copy of the site management plan and consent conditions remained on-site in a pre-prepared site folder. The site folder also included a copy of the intrusive analysis report.
Prior to commencing soil disturbance, a risk assessment should be completed to categorise the site in terms of the four levels of risk.	7 a-d	**YES.** An intrusive investigation was completed at the site, with the level of risk identified for the site before works were started.
Notification of the use of the Consent to Christchurch City Council.	8 a-e	**YES.** Notification was sent to CCC at least 10 working days prior to the commencement of any site works.
Christchurch City Council has responded that risk category and SMP are appropriate for the site.	9	**YES.** Email response was received from CCC stating that the risk category and SMP allocation was appropriate.
Project works were carried out in accordance with the relevant SMP	11	**YES.** Controls outlined in the SMP were completed on-site throughout the redevelopment.
Importation of fill material to the site must meet cleanfill criteria or be virgin aggregate.	13	**N/A**
All practicable measures shall be undertaken to minimise the disturbance of contaminated or potentially contaminated soil.	14	**YES.** Soil disturbance was limited to the construction of the piles and driveway redevelopment.
Stormwater and sediment control shall be installed and maintained at the site as per ESCP prepared for the site.	15 a-b	**YES.** Silt socks placed at the site as per the ESCP and were regularly checked throughout the redevelopment.
Off-site soil disposal shall follow methods outlined in the SMP	16	**YES.** Appropriate transportation of material off-site was completed.
All spoil and other waste from the project shall be disposed at an appropriate facility.	17	**YES.** Material from the site works were disposed of at Burwood Landfill. Record of disposal is available.
Contingency measures – should gross contamination be identified at the site, notification would be sent to CCC.	18	**N/A**

Condition	CCC Consent No.	Criteria Met
A validation report shall be sent to CCC following the completion of the site works.	19-21	**YES.** This report shall provide information in relation to a validation report for the site.

Conditions not shown above were considered to not be relevant to the specific site works completed on site.

5 Conclusions

Following the devastating earthquakes across the Canterbury region in September 2010 and February 2011, a number of properties and land were damaged including the residential dwelling at s 9(2)(a) s 9(2)'. The house was subsequently assessed and a rebuild by the insurance company Southern Response was considered the appropriate course of action.

Prior to the rebuild of a domestic dwelling at the site, ENGEO conducted an intrusive investigation and confirmed that it is situated on a former landfill site. Soil samples taken from the site indicated elevated concentrations of arsenic, cadmium, lead and BaP eq., above residential soil contaminant standards (SCSs).

As the site contained elevated levels of arsenic, cadmium, lead and BaP eq., Canterbury Regional Council (CRC) and Christchurch City Council (CCC) imposed a number of consent conditions during the rebuild as per the Regional Plan and Resource Management Regulations 2011.

The consent conditions for the site, from both CRC and CCC, stated that a Site Validation Report was required to be completed to show that site remediation had been undertaken and the SMP was adequately adhered to.

The works at the site involved the rebuild of the residential dwelling including ground improvement works, demolition and replacement of the on-site garage and repair and replacement of patios and paving.

Regular visits during the redevelopment of the site by ENGEO and Arrow International provided information that works were being undertaken in accordance with the approved SMP. It is considered that the conditions set out in the consents (RMA92029513 and CRC157521) were met during the redevelopment works at the site.

ENGEO conclude that the measures in the CCC and CRC approved SMP were completed, with correct procedures put in place to manage minor non-conformances. All material removed off-site was taken to Burwood Landfill, with waste dockets provided in Appendix 2.

The works completed at the site were for redevelopment purposes only and did not seek to provide a full characterisation or remediation of site soils across the whole site. There is a potential for unidentified hot spots of contamination to remain at the site. Future site occupants should be informed of the potential for contamination in the underlying soil and potential long term impacts from this material.

6 Limitations

i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Southern Response, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site inspections and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific requirements of the Client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it must be appreciated that actual conditions could vary from the assumed model.

iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

iv. This report is not to be reproduced either wholly or in part without our prior written permission.

If any further information is required regarding the works to be completed at the site, please contact the undersigned on 03 328 9012.

Report prepared by

Hazel Atkins

Engineering/Environmental Geologist

Report reviewed by

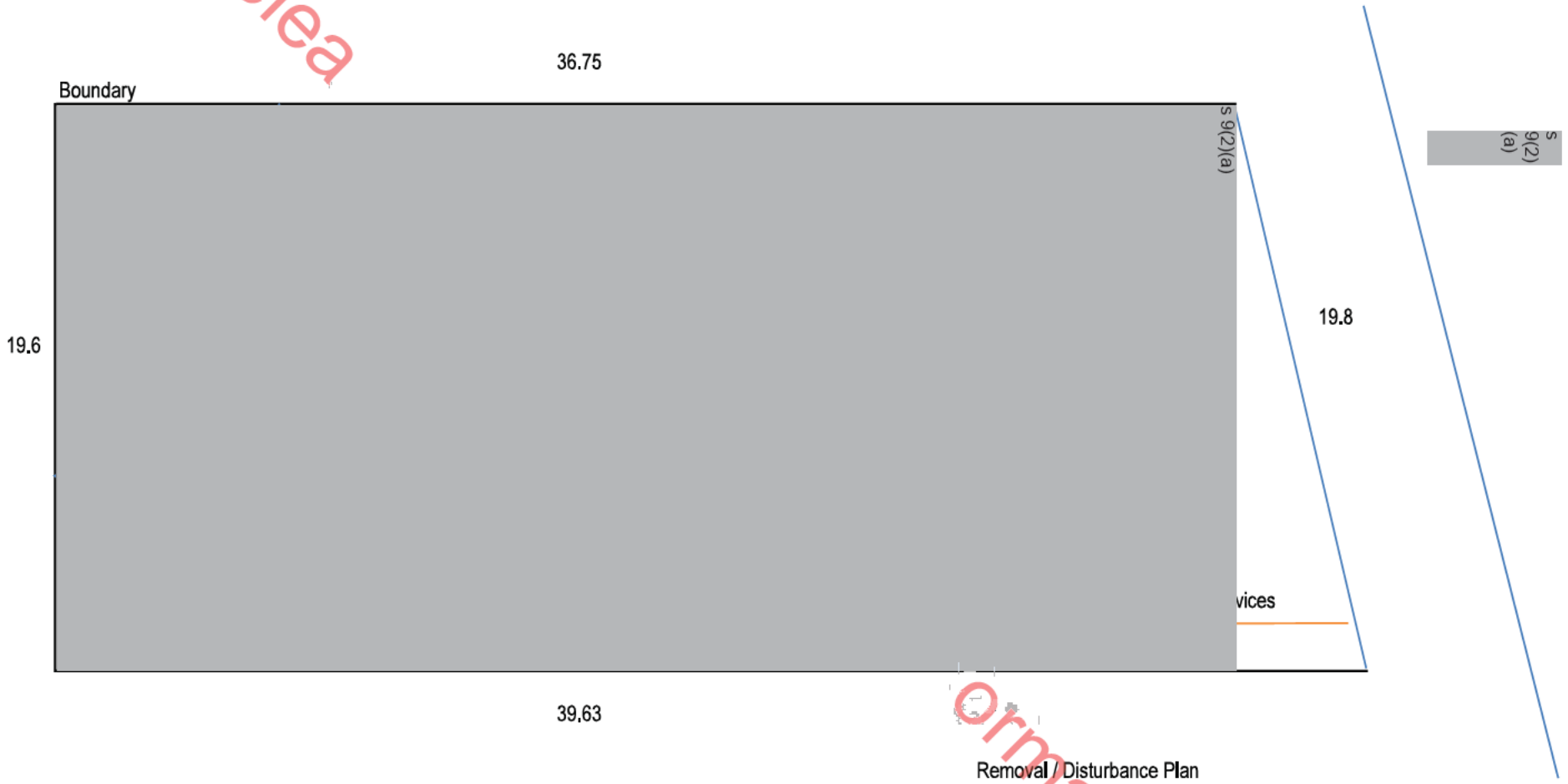
David Robotham, CEnvP – CL Specialist

Principal Environmental Consultant

Attachments:

Attachment 1: Final Site Plan

Attachment 2: Soil disposal dockets



Removal / Disturbance Plan

Floor area	160.2	m2	Total removed m3
Perimter	27	m2	
Contigency & Services	10	%	**164.7**
Raft Depth	0.8	m	

s 9(2)(a) Christchurch

TAX INVOICE

McMillian Drilling Civil Ltd
19 Yukon Place
Hornby South
Christchurch 8042
NEW ZEALAND

Invoice Date
31 Oct 2015

Invoice Number
INV-384

Reference
s 9(2)(a)
contaminated material

GST Number
109087181

Bin King Limited
PO Box 1933
Christchurch 8140
Phone 03 313 8967

Description	Quantity	Unit Price	GST	Amount NZD
s 9(2)(a) contaminated material carting & dumping to Kate Valley	83.54	s 9(2)	15%	s 9(2)(b)
			Subtotal	s 9(2)(b)
			TOTAL GST 15%	s 9(2)(b)
			TOTAL NZD	s 9(2)(b)(ii)

Due Date: 20 Nov 2015
Payment by Direct Credit may be made to our account
Bin King Ltd ASB 12-3148-0244216-00

PAYMENT ADVICE

To: Bin King Limited
PO Box 1933
Christchurch 8140
Phone 03 313 8967

Customer McMillian Drilling Civil Ltd
Invoice Number INV-384
Amount Due s 9(2)(b)(ii)
Due Date 20 Nov 2015
Amount Enclosed

Enter the amount you are paying above