

**BEFORE THE CANTERBURY REGIONAL COUNCIL**

**UNDER THE**

Resource Management Act 1991

**AND**

**IN THE MATTER**

of application CRC190445 by the Christchurch City Council for a comprehensive resource consent to discharge stormwater from within the Christchurch City area and Banks Peninsula settlements on or into land, into water and into coastal environments

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**STATEMENT OF  
EVIDENCE OF MARK JAMES TIPPER FOR CHRISTCHURCH CITY COUNCIL**

**Dated 15 October 2018**

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## INTRODUCTION

1. My full name is Mark James Tipper. I have been requested by the Christchurch City Council (**Council**) to give evidence in relation to the application for a comprehensive stormwater network discharge consent (**Application**).
2. I hold the qualification Bachelor of Science (Honours) in Environmental Science from Plymouth University, England.
3. I am employed as a Senior Environmental Advisor by the Council. I have worked in this role for approximately 18 months.
4. Previously I was employed for 4 years by Central Plains Water Limited as Environmental Consents and Compliance Manager. In this role I developed and implemented strategies for managing compliance with the raft of permits and resource consents associated with that project. I managed all aspects of environmental compliance for Stage 1 of the project. This involved building a 40cumec intake in the bed and banks of the Rakaia River, construction of ~18km of headrace canal, and installation of ~120km of pipe network. During this project, erosion and sediment control, and managing discharge quality to within consent parameters, was of paramount importance to the consenting authorities (with the exception of DOC, whose principal focus was on managing effects on lizards and their habitat). Developing and subsequently implementing the Erosion and Sediment Control Plan dominated the operational portion of my time on the project. The project took 18 months and achieved 100% compliance with all permits and consents.
5. Prior to that I was employed for 6 years by Environment Canterbury in Consenting and Compliance roles. As a Senior Compliance Officer I specialised in stormwater management and erosion and sediment control. During this time I provided advice on plan changes relating to construction phase stormwater management and practicable discharge quality standards. I also invented and patented a tool for instantly and simply determining compliance with total suspended solid (**TSS**) limits, such as those typically applied to stormwater or dewatering discharge consents.

6. My role at the Council is to develop processes and strategies to improve environmental management on Council projects, and to provide advice on best practice for environmental management on work sites. This is a new role that was recently created by the Council to improve focussed attention by the Council on environmental management. I am one of Council's representatives on the joint Council/Environment Canterbury Water Issues Management Group (**WIM**) and the operational-level Stormwater Alliance Team (**SWAT**).
  
7. I have read the following documents in preparing my evidence:
  - a) CRC190445 s42A report by Nick Reuther;
  - b) The current draft of the Applicant's proposed conditions for CRC190445;
  - c) Council resource consents CRC190369, CRC090292 and CRC120223;
  - d) The draft evidence of Dale McEntee and Julia Valigore;
  - e) The Canterbury Land and Water Regional Plan; and
  - f) Council's Water Supply, Wastewater and Stormwater Bylaw 2014 <https://ccc.govt.nz/the-council/plans-strategies-policies-and-bylaws/bylaws/water-supply-wastewater-and-stormwater-bylaw-2014>.
  
8. For the purposes of my evidence the following definitions apply:
  - a) **Council projects** means works where Council is the principal and consent holder;
  - b) **Sites authorised by Council** means sites where work is being carried out under a Council authorisation, (e.g. building consent, resource consent, permitted activity in the District Plan, designation under the Resource Management Act) but where Council is not the principal or consent holder (i.e. has no role in the works other than as regulator); and
  - c) **Hold Points** means stages of development or construction at which no further works may be undertaken until an inspection has occurred (by Council or its representative) and approval to continue has been granted.

9. I confirm that I have read and agree to comply with the Code of Conduct for expert witnesses contained in the Environment Court Practice Note (dated 1 December 2014). I confirm that the issues addressed in the statement of evidence are within my area of expertise. I have not knowingly omitted to consider facts or information that might alter or detract from the opinions expressed. The Council as my employer has agreed to me giving this evidence on its behalf.

## **SUMMARY OF EVIDENCE**

10. In my evidence I:
  - a) describe the Council's current methods for managing erosion and sediment control on Council projects and sites authorised by Council;
  - b) describe measures to improve Council's processes with regard to managing erosion and sediment control, and explain the changes implemented and planned to date to close these process gaps. These improvements, identified in early 2018, relate to managing erosion and sediment control on both Council projects and other sites authorised by Council that have the potential to discharge sediment in the Council stormwater network;
  - c) Provide responses to some of the matters raised in the s42A report by Mr. Nick Reuther in relation to managing erosion and sediment control and construction phase sediment discharges.
11. My evidence addresses:
  - 11.1 The following factors relevant to the Council's current ability to manage sediment discharges into the stormwater network:
    - a) Opportunities for Council to authorise erosion and sediment control;
    - b) Opportunities/limitations for proactive monitoring; and

- c) Background to Council's management of erosion and sediment control plans.

11.2 The following measures being implemented to improve the Council's performance in those factors:

- a) The Environmental Risk Assessment and Management Plan template;
- b) Erosion and sediment control training for Council staff; and
- c) Current and proposed amendments to Council processes.

## **COUNCIL'S CURRENT MANAGEMENT OF EROSION AND SEDIMENT CONTROL**

### **Council's means for requiring and monitoring compliance with Erosion and Sediment Control Plans**

12. Council has a number of mechanisms currently in place for authorising and managing the effects of earthworks of varying scales. These are (in no particular order):

- Resource consents;
- Building consents;
- Permitted activity rules;
- Designations; and
- Stormwater approvals, issued in the Council's role as owner and operator of the stormwater system, where approval is sought to discharge into the stormwater network. These discharges typically include temporary stormwater runoff and dewatering water discharges.

13. A further mechanism for managing effects of earthworks is via responding to unauthorised activities, typically in response to complaints.

14. Not all of these mechanisms require preparation and provision of an Erosion and Sediment Control Plan (**E&SCP**) to Council, and/or monitoring to ensure the mitigation measures have been implemented prior to earthworks commencing.

#### **Unconsented activities**

15. Permitted activities and designations do not require provision of an E&SCP for review/acceptance by Council, or monitoring by the Council staff (nor even certification by a suitably qualified independent expert), prior to or during earthworks, yet works under these authorisations are commonplace. Further, there is typically no requirement to notify Council of earthworks being carried out under a permitted activity or designation.
16. One example of this is District Plan earthworks rule **8.9.2.1**. This permitted activity rule includes a number of conditions, and provides Advice Notes directing attention to Environment Canterbury's Erosion and Sediment Control Guidelines, the Land and Water Regional Plan (**LWRP**) earthworks rules, and Council's Water Supply, Wastewater and Stormwater Bylaw 2014 (the **Bylaw**). However, the rule itself includes no requirement to advise Council of works being undertaken, nor for provision (or even preparation) of an E&SCP.
17. In the absence of any opportunity to review, approve and/or monitor the implementation of an E&SCP for permitted (or otherwise unconsented) earthwork activities, there is an inherent risk that sediment could be discharged into Council's stormwater network under circumstances where Council has no ability to proactively control, monitor, authorise or prevent this.
18. Similarly, in my experience Environment Canterbury's permitted activity rules also do not require notification of works or provision of information prior to commencing works, and therefore carry the same inherent risk. For example, LWRP permitted activity rule 5.119 authorises dewatering discharges to surface water. Whilst this rule includes a discharge quality limit (amongst other conditions), there is no requirement for notification or provision of a plan showing how compliance with the standards of the rule will be achieved. In my

experience this rule is often relied upon to discharge dewatering water into the Council stormwater network.

19. Council's principal mechanism for instigating monitoring of the effectiveness of erosion and sediment control measures associated with unconsented activities is limited to responding to complaints from the community (details of the process that is followed in response to complaints is outside my area of expertise). The Council has a separate enforcement and compliance team dedicated to responding to complaints relating to works that are not associated with a building or resource consent (i.e. works that are authorised under a permitted activity or designation, or are unlawful). This division of compliance monitoring/complaint response is similar to Environment Canterbury's approach. Environment Canterbury has teams for monitoring compliance with (and responding to complaints relating to) consented activities, and a separate team dedicated to responding to complaints relating to unconsented activities.
  
20. A fundamental difference between the ability for Council and Environment Canterbury to respond to complaints of unlawful or noncompliant sediment discharges is the legislation against which the discharge is being assessed. Relevant regulation for Council staff is the Bylaw, whereas for Environment Canterbury staff it is the RMA. This difference is important because of the enforcement options available under the different legislation. Under the Bylaw the available enforcement tools are prosecution (with a maximum penalty of \$20,000) or injunction proceedings in the District Court to restrain a person from committing a breach of a bylaw. Prosecution in particular is a complex and onerous process for all involved, and not all noncompliant or unlawful activities may justify this level of response. By contrast, the RMA provides a wider range of enforcement options, affording Environment Canterbury officers the ability to respond more appropriately to noncompliant or unlawful activities (improvements to address this issue are explained in paragraph 56 below).

### **Consented activities**

21. Council currently requires that an E&SCP is supplied with every application for a building consent that incorporates an element of earthworks and for resource consent for earthworks (provided that the scope of discretion in the District Plan



for resource consent applications allows it to do so). The E&SCP is reviewed by Council consent planning staff and (once Council is satisfied with the Plan) a building consent is issued with conditions requiring that erosion and sediment control measures are installed and maintained in accordance with the Plan supplied with the application (the limitations of this part of the current process are explained in paragraphs 25 to 28 below).

22. Compliance with building consents is monitored by Building Inspectors according to a predetermined schedule of inspections (**Building Inspectors Schedule**), under the Building Act. The Building Inspector's Schedule creates a series of Hold Points that require the consent holder/builder to arrange a site visit by an Inspector to monitor compliance at specified stages of construction. On sites that involve earthworks the first visit is typically prior to pouring foundation concrete. By this point in the construction process the highest period of erosion and sediment control risk for the site has already past. This means that the first opportunity Council staff have to monitor implementation of the accepted E&SCP is after the period when the effectiveness of those controls is most important (improvements to address this issue are explained in paragraph 56 below).
23. Compliance with resource consents is monitored by Regulatory Compliance Officers or, if it is a subdivision with associated earthworks by the subdivision approval engineers, under the Resource Management Act. When a consent is passed to a Regulatory Compliance Officer for monitoring (typically within three to four days of the consent being granted), the Officer will contact the consent holder to discuss matters such as commencement date and provision of an E&SCP. Sometimes an E&SCP is provided with the application and forms part of the consent, sometimes an E&SCP is required a specified number of days prior to works commencing. Either way, this provides the Officer an opportunity to schedule a site visit at or about the time works commence, and to inspect compliance with the E&SCP at an early stage.
24. Compliance with erosion and sediment control conditions imposed on earthworks associated with medium-to-large sized subdivisions is managed by the subdivision engineers who monitor the implementation of the resource consent conditions.

## Background to Council E&SCP management

25. The standard of E&SCP submitted to Council as part of a building consent process tends to be generically worded. This approach by applicants and their consultants is designed to maximise flexibility and minimise revision of the E&SCP. This type of E&SCP typically includes statements akin to the following:  
*“We will use suitably trained and experienced staff to identify environmental risks and install appropriate erosion and sediment control measures throughout the duration of this project. Selected controls will be installed prior to earthworks commencing. All controls will be installed and maintained in accordance with Environment Canterbury’s Erosion and Sediment Control Guideline 2017 for the duration of works and will not be removed until all areas are stabilised.”*
26. This type of statement sounds positive, and appears to fundamentally consider and address the principal concerns and requirements of an E&SCP. However, this type of statement does not actually provide any information on what controls will be used or where, and allows no assessment of how effective those controls might be. It also provides no baseline or minimum standard against which to assess compliance.
27. Some Council staff auditing building and resource consent applications have limited training or experience in relation to the principles of erosion and sediment control and preparation of E&SCPs, and there is a well-established precedent for accepting the type of generically worded Plan described above. This places a level of expectation on the Building Inspectors and Regulatory Compliance Officers to determine whether or not the E&SC measures installed on a given site are adequate and appropriate or not, and those officers themselves may not have the experience or training in erosion and sediment control measures to be able to make that determination. Furthermore, it can be difficult to encourage/require a person/company to comply with an E&SCP that contains no details, drawings or specifics.
28. This combination of factors creates a situation where even if an Inspector or Officer visits a site at an early stage of the construction process, their ability to

thoroughly assess and respond appropriately to poor E&SC measures may be reduced.

## **IMPROVEMENTS TO COUNCIL PROCESSES FOR EROSION AND SEDIMENT CONTROL**

### **Environmental Risk Assessment and Management Plan**

29. Over recent years Environmental Management Plans (**EMPs**) have become a commonplace means for managing a variety of risks and potential effects on construction sites. I am not aware of any earthworks related consent that does not include (as a minimum) a condition that requires the holder to provide an Erosion and Sediment Control Plan (and/or other relevant EMPs) to the issuing authority prior to commencing works. E&SCPs are the most common form of EMP.
  
30. It is not uncommon to find one or more of the following additional types of EMP to be required by consent conditions:
  - a) Construction Management Plan;
  - b) Archaeological and/or Cultural Management Plan;
  - c) Dust Management Plan;
  - d) Noise Management Plan;
  - e) Vibration Management Plan;
  - f) Dewatering Management Plan;
  - g) Chemical Treatment Plan;
  - h) Contamination Management and/or Hazardous Substance Storage Plan;
  - i) Tree Protection Plan;

- j) Rehabilitation Management Plan; or
  - k) Rare Species and/or Habitat (e.g. fish passage, bird nesting, lizards, wetland, etc.) Management Plan.
31. Reliance on a (suite of) EMP(s) can reduce the weight of information provided at the application phase, and also provides a mechanism for adapting to changes or unexpected onsite conditions. Also, by including the flexibility to update EMPs as required in the consent conditions, the time and cost associated with applying to amend prescriptive consent conditions is avoided.
32. In my experience there are two key issues with relying on EMPs however:
- a) Multiple EMPs and resource consents for the same project can create a befuddling framework of overlapping guidance documents and requirements that can confuse all but the most experienced practitioners; and
  - b) EMPs are typically prepared by the contractor in the short period of time between being awarded the contract and commencing works on site. This inevitably means there is insufficient time to adequately assess site specific risks, devise appropriate specific controls, and develop a detailed (suite of) EMP(s).
33. To improve the process around erosion and sediment control I helped Council develop the Council Environmental Risk Assessment and Management Plan template (the **Template**) for Council projects in 2017. A copy of the Template is attached as **Appendix A**. This Template is now relied upon extensively by the Council for Council projects. The Template has also been included with the recently granted application to amend Council's 'Global' dewatering resource consents (CRC190368 and CRC190369) issued by Environment Canterbury in August 2018. These consents require that the Template is used when these consents are relied upon. Given dewatering is a commonplace activity on Council projects, this requirement ensures that the Template will be employed on many Council projects.

## **Advantages of the Template**

34. The Template is developed and evolves throughout the duration of a Council project, from concept through to completion. Both Council and its selected contractor develop the Template in a two stage process that is specific to each project. Instructions on how to use the Template are explained on page 2 of the Template attached as **Appendix A**.
35. In addition to recording and sharing project specific knowledge of identified environmental risks, the Template also provides both a check list to considering potential risks on any given project, and a framework for recording how each of the identified risks will be managed for that specific project. By its very format the Template encourages input of project specific information and minimises the capacity for generic statements.
36. By requiring details of the specific controls that will be used to manage each of the identified risks for a project, Council has both the ability to assess the adequacy of the proposed controls prior to site establishment, and the opportunity to provide feedback to improve the effectiveness of the proposed controls.
37. By accepting a completed Template, Council also establishes a minimum baseline for environmental management that the contractor will be held accountable to (by contrast it is contractually very difficult to enforce adherence to a generically worded E&SCP). This combination of factors means the Template provides a far more robust mechanism for ensuring environmental management standards are met on Council projects than the more generic EMPs typically employed on other sites.
38. It is also worth noting that use of the Template over approximately the past 10 months has led (at least in part) to a perceptible paradigm shift in the tendering process, which has had a corresponding effect on contract delivery. By providing more detailed information on environmental risks associated with a project, and requiring detailed description of specific methodologies and controls in the Template, environmental management on Council projects has become a valued attribute that influences selection of the preferred candidate. Over time this paradigm shift has communicated an increased level of

expectation to Council's contractors and some have responded by increasing their own environmental management resources.

39. The Template has therefore helped to raise the bar of environmental awareness and performance on Council projects significantly.

#### **E&SC Training for Council Staff**

40. In consultation with myself and Nathan Dougherty of Environment Canterbury, an external consultancy agency (Southern Skies) has developed and delivered a training program specific to Council needs. Southern Skies is a highly reputable New Zealand company with offices in Wellington and Auckland. Southern Skies specialise in erosion and sediment control; they provide specialist training, develop E&SCP's, undertake monitoring on behalf of contractors or councils, and advise on consent applications. When Environment Canterbury has previously organised erosion and sediment control training courses, it has often been Southern Skies who have delivered the training. The Chief Executive of the company is also engaged from time to time as a Commissioner.
41. In this instance, the training was delivered to Council staff on 4 and 5 October 2018. This training was made available to all Council involved with auditing, approving, monitoring and enforcing E&SC controls and/or E&SCPs.
42. The training included information on available sediment controls, appropriate selection and installation/maintenance of controls, the level of information required in a comprehensive E&SCP, and how to audit E&SCPs. Follow up information to attendees will include conditions relating to erosion and sediment control and E&SCPs that Southern Skies have seen used successfully across New Zealand.
43. The purpose of this training was to support Council staff to effectively audit E&SCPs, and to enable Building Inspectors and Regulatory Compliance Officers to critically assess the effectiveness of the controls once established on site. I anticipate that this training, coupled with ongoing in-house support and increased level expectation by Council staff, will drive an improvement in the standard of E&SCPs received from applicants, followed by a commensurate

improvement in onsite E&SC on sites authorised by Council in a manner similar to that witnessed following implementation of the Template.

### **Planned Amendments to Processes**

44. In addition to the Template and provision of E&SC training to Council staff, which have already been implemented, I am part of a project team that is investigating opportunities for Council to further improve its ability to proactively manage and monitor E&SC in situations where sediment could be discharged into the Stormwater Network.

### **Current Situation and Opportunities**

45. The investigation has identified that the process for requiring, auditing and monitoring E&SCPs through the resource consent process is robust and operating well. I consider that the E&SC training provided to staff will serve to improve this process.
46. The building consent process currently includes requiring, auditing and monitoring E&SCPs. However, of all the mechanisms listed in paragraphs 12 and 13 above for managing effects of earthworks, the Council Bylaw provides a more appropriate mechanism for requiring and monitoring E&SCPs (other than the current resource consent process).
47. Part 3 of the Bylaw specifically deals with stormwater. The objectives set out in clause 29 are:
  - a) To control the discharge of contaminants into the public stormwater system.
  - b) To enable the Council to meet relevant objectives, policies and standards for discharges from the public stormwater system.
  - c) To protect the land, structures and infrastructure of the public stormwater system
  - d) Prevent the unauthorised discharge of stormwater into the public stormwater system.

- e) Defining the obligations of the Council, installers, owners and the public in matters related to the discharge of stormwater and management of stormwater systems
48. Clause 32 of the Bylaw provides that:
- a) Unless authorised by the Council, an Erosion and Sediment Control Plan must accompany all applications for new or re-development sites. The design and performance criteria of the Plan shall be in accordance with the current version of the Environment Canterbury Erosion Sediment Control Guidelines.
  - b) No site works are to commence until the Erosion and Sediment Control Plan has been approved by Council. The Erosion and Sediment Control Plan shall be implemented on site during the construction phase.
49. Therefore, under the Bylaw the following applies:
- a) The design and performance criteria of the Plan must be in accordance with the current version of the Environment Canterbury Erosion Sediment Control Guidelines;
  - b) An E&SCP must accompany an application to Council (unless otherwise authorised). This includes applications for designations, resource consents, building consents, and stormwater approvals;
  - c) No site works can commence until the ESC Plan has been approved by Council; and
  - d) The ESC Plan needs to be implemented on site during the construction phase.
50. I note that Mr. Reuther recognises the importance of the Bylaw in para 32 of his s42A report, and I agree with his comments. However, Council currently has no particular approval process in place for the lodging or acceptance of ESC Plans under the Bylaw. There is no application form to seek approval, nor an approval form or conditions to select if approval is granted. There is also no established process for proactively monitoring approvals granted under the Bylaw.



51. The Bylaw is made under the Local Government Act. The provisions for authorised Council Officers to access land under these provisions do not cover the entry for the purpose of routine monitoring. Instead, Officers are only authorised to enter land where they already have reasonable grounds for suspecting that a breach of clause 32 has occurred or is occurring on the land.
52. In the absence of a clause in the Bylaw providing for routine monitoring, two ways in which this could be addressed are through it being a condition of approval of the ESC Plan, and/or a Bylaw amendment which provides for routine monitoring.
53. Consent Planners, Building Inspectors and Regulatory Compliance Officers require delegated authority under the Bylaw in order to be able to issue permits and monitor/enforce the Bylaw.
54. Additional funding mechanisms, IT support, process development and resourcing are also required to achieve the greatest improvements to Council's ability to proactively manage erosion and sediment control whilst maintaining all its other responsibilities.

#### **Process Amendments**

55. The project team that I am part of has identified the following process amendments for implementation in the short term. These amendments are likely achievable within Council's existing resources:
  - a) When an application for a resource consent, building consent, designation or stormwater approval involving earthworks (or other potential source of sediment discharge to the Council stormwater network) is received, and where an E&SCP cannot otherwise be required under the relevant legislation (e.g. Building Act), the Council will require provision of an E&SCP (and subsequently audited, approved, and monitored prior to earthworks commencing) in accordance with the Bylaw prior to works commencing.
  - b) Council will develop an application form to facilitate application for an E&SCP under the Bylaw.

- c) Council will develop an approval form for E&SCPs accepted under the Bylaw. This approval or 'Permit' will include conditions such as (but not limited to):
  - i) The holder shall provide to Council [likely a nominated person or contact address] a site specific Erosion and Sediment Control Plan at least ten working days prior to commencing works. Works shall not commence until Council has accepted the Plan;
  - ii) The holder shall advise Council [likely a nominated person or contact address] of the date that works will commence at least ten working days in advance of that date;
  - iii) Council Officers shall be able to enter the property at any time to monitor compliance with the accepted Plan;
  - iv) Advice Note: If the accepted Plan is not implemented, and/or if there is a breach of the Bylaw, enforcement action may be taken including but not limited to cancellation of this [Permit].
- d) Inform the community of this change in approach to managing E&SC on new and re-development sites authorised by Council (which may involve a reasonable transition period).
- e) Seek sub-delegation from the Chief Executive to authorise appropriate Council staff to audit, accept, monitor and enforce E&SCPs under the Bylaw.
- f) Delegate authority to appropriate Council staff under section 174 of the Local Government Act to enable proactive monitoring of compliance with E&SCPs.
- g) Develop a flow chart or 'Ready Reckoner' for Consent Planners to enable identification of the legislation that can be relied upon to require an E&SCP where applications are received for earthwork related activities.

- h) Identify areas where inappropriate and/or inadequate erosion and sediment control during earthworks is more likely to cause issues of sediment discharges into the Council stormwater network, for example sites on the Port Hills, close to waterways, or large areas of exposed soils. Establish a mechanism for prioritising these high risks sites for monitoring (Note: This assessment of risk pertains to earthworks, and differs from the risk assessment referred to in Ms. Valigore's evidence that refers to risks associates with industrial sites).
56. The changes described above are largely matters of internal process development. Some other opportunities for improvement may require an increase in Council funding and resourcing, and will therefore likely take longer to investigate and implement. These include:
- a) Add an earlier site visit to the Schedule of Building Inspections that is to be completed after E&SC measures have been installed (in accordance with the approved E&SCP) and prior to any earthworks commencing.
  - b) Environment Canterbury has recently notified the community of an increased focus on inadequate erosion and sediment control on small and unconsented sites. Complaints relating to this type of activity will be followed up and Environment Canterbury will issue instant fines of \$750 where appropriate. Council will work to develop a Memorandum of Understanding (or similar form of written agreement) with Environment Canterbury to enable Council Officers to draw upon this resource to provide alternative enforcement options in relation to breaches of the Bylaw.
  - c) Consider whether/how to increase funding and resourcing to better facilitate proactive management of erosion and sediment control where it falls within Council's responsibilities.
57. In particular, I understand that funding the additional E&SCP monitoring inspection to be included as an initial site visit in the Building Inspector's Schedule will require levying a new charge under the Bylaw. I understand that changes to charges levied under the Bylaw are subject to (amongst other requirements) community consultation.

58. Matters of funding, resourcing and community liaison are outside my area of expertise, however I have identified them briefly here as I anticipate they will affect the timeliness with which Council is able to implement some of the changes described above. I note that Mr. Reuther has also identified that these matters “*will present a challenge*”<sup>1</sup>.
59. Having read the conditions proposed for the Application and Mr. Reuther’s s42A report, I note that Mr. Reuther provides comment that “*A TSS limit would be a helpful means to measure compliance of discharges from individual sites.*”<sup>2</sup> I agree strongly with this comment.
60. I am aware that the existing stormwater consents CRC090292 and CRC120223 (both of which authorise construction phase stormwater discharges to the stormwater network) do not include any specific construction phase TSS discharge limits. Condition 15 of CRC090292 requires that “*The discharge during site construction shall be via best practicable erosion and sediment control measures undertaken to minimise erosion of land, and the discharge of sediment-laden stormwater, into the CCC stormwater drainage network, off-site or into water.*” Conditions relating to management of construction phase stormwater in CRC120223 are even less prescriptive. It is my experience that contractors sometimes seek to take advantage of this limitation in sediment discharge quality management (“*if there is no limit in the consent, there is no limit*” or words to this effect). Setting a specific construction phase TSS (or other enforceable water quality limit(s)) would firmly close that gap. These observations align closely with paragraphs 262 and 263 of Mr. Reuther’s evidence, and I support the suggestion in paragraph 263 that some flexibility (subject to Council and/or Environment Canterbury approval) be included to allow for those sites where TSS limits are regularly exceeded despite implementation of “all reasonable control measures”<sup>3</sup>. One example of this can be seen in condition 13 of Council’s recently granted discharge consent CRC190369 which states:

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<sup>1</sup> Para 172, CRC190445 s42A report by Mr. Nick Reuther (though I note similar references are also recorded elsewhere in the report).

<sup>2</sup> Para 256, CRC190445 s42A report by Mr. Nick Reuther

<sup>3</sup> All reasonable control measures, or words to this effect, would need to be determined by the opinion of Council and/or Environment Canterbury, not the contractor.

- a) *The concentration of total suspended solids in all the discharges leaving the site shall not exceed 100g/m<sup>3</sup>;*
  - b) ...
  - c) *The discharge may only exceed the limit specified in Condition (13)(a) if all practicable measures to reduce the suspended sediments in the discharge have been undertaken and the written agreement of the Canterbury Regional Council, Regional Leader – Monitoring and Compliance has been obtained.*
61. However, in my opinion it is important that Council set construction phase TSS limits on those who it approves to discharge into the Council stormwater network, as opposed to a condition in this consent which would impose a TSS limit on Council rather than those directly responsible for managing the discharge.
62. I would therefore suggest a condition in this consent that requires:
- a) The Council to impose a total suspended solids limit of not exceeding 100g/m<sup>3</sup> in all approvals to discharge construction phase discharges into the Council stormwater network unless (b) below applies.
  - b) That where Council believes there is a high risk [for example, as determined by the risk matrix referred to in paragraph 55(h) above or in Julia Valigore's evidence] to the receiving environment and/or the stormwater network, Council may impose a more restrictive limit.
  - c) The Council's approval of the discharge can authorise the discharge to exceed the limit specified in accordance with condition (a) or (b) if all practicable measures to reduce the suspended sediments in the discharge have been undertaken and the written agreement of the Canterbury Regional Council, Regional Leader – Monitoring and Compliance has been obtained.
63. Mr. Reuther also comments in paragraph 261 of his evidence (and elsewhere) that additional staffing and resources may be required to effectively monitor

compliance with these limits. Whilst the proposed additional site visit by Building Inspectors may help, this will only be in relation to sites where a building consent has been issued. Additional resources may also be required for sites authorised under the other mechanisms described in paragraph 12 above, however for those “high risk” sites that are excluded by conditions 2 and 3 from authorisation under the consent until 2025, Council has until 2025 to identify those needs and develop strategies to meet them.

64. Whilst I broadly agree with Mr. Reuther’s recommendations in regards to erosion and sediment control, I do not agree that the level of oversight required by paragraphs 268 (e) and (f) is required by Environment Canterbury (though it may benefit Council as an internal process). It is my experience that administrative conditions of this nature often require a great deal of time and cost to comply with yet provide a disproportionately small (if any) benefit in terms of managing effects in the real world.

## **SUMMARY/ CONCLUSION**

65. In my evidence I have identified some issues with current and past processes that have negatively affected Council’s ability to effectively and proactively regulate sediment discharges into the Stormwater Network.
66. I have described a number of solutions now underway or planned for improving Council’s performance in ability to manage E&SC on both Council projects, and sites authorised by Council, some of which have already been implemented (the Template and Staff training). I have observed a marked and deliberate improvement in environmental management on Council projects following adoption of the Template.
67. Council has until 2025 to establish strategies to meet all the resourcing needs that CRC190445 may require (if granted) for high risk sites that will be excluded from coverage of the resource consent until that date.
68. Conditions requiring external oversight, consultation, and reporting should be limited to effects management and not Council’s internal or administrative processes.

69. As the improvements described in my evidence are developed and implemented, they will each improve Council's ability to effectively manage construction phase sediment discharges into the stormwater network.

**Mark James Tipper**

**15 October 2018**

## **Appendix A**

### **Environmental Risk Assessment and Management Plan template**



# Environmental Risk Assessment & Management Plan

Designer: [Click here to enter Designer Name](#)

Contractor: [Click here to enter Contractors Name](#)

[Click here to enter project title](#)

Environmental Factor	Risk	Environmental Effect	Risk
Rivers, Lakes, Streams and Drains	Risk level	Fish Passage/Salvage	Risk level
Groundwater and Springs	Risk level	Erosion and Sediment Control	Risk level
Flora and Fauna	Risk level	Dewatering	Risk level
Coastal Habitat and Processes	Risk level	Stormwater	Risk level
Protected Trees	Risk level	Dust and Air Quality	Risk level
Archaeology, Heritage & Cultural	Risk level	Noise	Risk level
Contaminated Land	Risk level	Vibration	Risk level
Coal Tar	Risk level	Hazardous Substances	Risk level
Asbestos	Risk level	Rehabilitation/Landscaping	Risk level
Wastewater	Risk level	Property Ownership	Risk level
Flowable Materials	Risk level	Waste Minimisation	Risk level
Additional Environmental Factor	Risk level	Additional Environmental effect.	Risk level

Table 6 - Project Environmental Risks

Table 6 - Project Environmental Risks

Version #	Prepared by	Reviewed by	Accepted by	Date
Draft for Tender	<a href="#">Designer.</a>	<a href="#">Planner.</a>	<a href="#">CCC PM.</a>	<a href="#">Click here to enter a date.</a>

Version#	Prepared by	Reviewed by	Approved by	Date
Tender Submission	<a href="#">Contractor.</a>	<a href="#">Contractor.</a>	<a href="#">Contractor.</a>	<a href="#">Click here to enter a date.</a>
Construction	<a href="#">Contractor.</a>	<a href="#">Contractor.</a>	<a href="#">Contractor.</a>	<a href="#">Click here to enter a date.</a>

## 1 How to use this document

Christchurch City Council (CCC) is committed to minimising adverse effects of its activities, infrastructure and facilities on the environment. The purpose of this Environmental Management Plan (EMP) template is to ensure that environmental management of all CCC projects is prioritised in a consistent and effective way and to a level that meets CCC's environmental commitment.

This EMP must be completed by the Design Team<sup>1</sup> and the Contractor (with reference to the Infrastructure Design Standard (IDS) and Construction Standard Specification (CSS)). The completed EMP must also be accepted by CCC prior to commencing any CCC works.

The EMP must be developed by both the Design Team and the Contractor to reflect the environmental risks and limitations associated with each project. Where a project has multiple work sites, these can be individually addressed or combined to form a project wide EMP as appropriate.

Development of the EMP is a two-stage process:


- The Design Team will identify and describe all the environmental elements and associated risks that need to be avoided/protected/managed/mitigated during the course of the project, and identify all consents and/or permitted activities required to authorise the works under the relevant legislation(s) (RMA, NZHPTA, Conservation Act, Wildlife Act, NES, Bylaws, etc.).
- The Contractor will specify how the identified environmental elements and risks will be managed during the course of the project, and describe the monitoring and reporting processes to ensure compliance with the EMP and relevant consents/permits/legislation. Reference should be made to Environment Canterbury's Erosion and Sediment Control Guideline.

The Sections of this EMP can be completed<sup>2</sup> to create a comprehensive and project specific Environmental Management Plan (if any sections are not relevant to the project, the reason for this should be recorded in section 2.7).

Identified limits or other Hold Points can then be identified in the Inspection Test Plan (ITP) for the Project to ensure pre-construction and other deliverables are achieved prior to further works (i.e. submission of Management Plans to ECan prior to works, etc.).

This standardised EMP format will help achieve environmental compliance, minimise project delays, drive best practice, and avoid inconsistencies between CCC projects, Designers, Contractors, and regulators. This EMP will also replace the multitude of separate Management Plans typically required in relation to CCC projects, such as Erosion and Sediment Control Plan, Construction Management Plan, or Dust Control Plan. The elements required by those Plans will simply be incorporated into the relevant sections of this EMP.

Only edit sections in **Green**. Ensure risk levels only ever edited in section 2.7. After editing to update the Table of Contents & Risk Assessment tables go to Print Preview.

To add an extra row to any table, click in any cell in the last row. You see  appear, click on this to add another row.

Refer to the section 'Updating the EMP' for further information around when this document must be updated.

---

<sup>1</sup> Note: 'Design Team' will include the Designer, an Environmental Planner, and may also include any other experts the Designer or Environmental Planner may seek guidance from (i.e. landscape Architect). May also include the Project Manager and Environmental Advisor.

<sup>2</sup> Note: In this document, wording in **green** is intended only as a guide. Type in the content for each relevant section.

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## 2 Introduction

### 2.1 Purpose of the Environmental Management Plan

Christchurch City Council (CCC) is committed to minimising adverse effects of its activities, infrastructure and facilities on the environment. This Environmental Management Plan (EMP) has been developed in relation to [insert Project title and brief description].

The purpose of this EMP is to identify the procedures and practices that will be employed by [insert Contractor(s)] to avoid environmental harm and ensure compliance with all relevant authorisations associated with this project.

This EMP is a live document that will be continuously reviewed and updated throughout the duration of the project. It is expected that once the construction contract is confirmed for the project, the contractor will update this management plan to ensure that it aligns with the final construction methodology and appropriately addresses all construction related impacts associated with this project.

### 2.2 Roles and Responsibilities

During the project to which this EMP relates, the following persons are responsible for ensuring the measures described in this EMP are implemented and maintained in accordance with the EMP and relevant conditions.

Table 1 - Roles and Responsibilities

Role	Company Name	Person Responsible	Contact Details
Project Manager	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Environmental Manager	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Foreman	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Subcontractor	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
CCC Contact Person	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>

During the project to which this EMP relates, the following persons are available to manage specific risks/activities as required.

Table 2 - Technical Experts

Role	Company Name	Person Responsible	Contact Details
Cultural expert/monitor	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Archaeologist	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Herpetologist	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Botanist	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Freshwater Ecologist	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Noise expert	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Vibration expert	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Contaminated land specialists	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Hazardous substances specialists	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Erosion and sediment control expert	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Dewatering expert	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>

Chemical treatment expert	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Wastewater expert	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
Waste contractor	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>
<a href="#">Click here to add another role</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>	<a href="#">Click here to enter text.</a>

### 2.3 Training

All staff carrying out construction, or those with site management responsibilities, will undertake a formal site induction that will identify all environmental risks and management processes described in this EMP. Anyone who is unfamiliar with any of the control or mitigation measures, equipment, and/or incident response procedures will receive appropriate training.

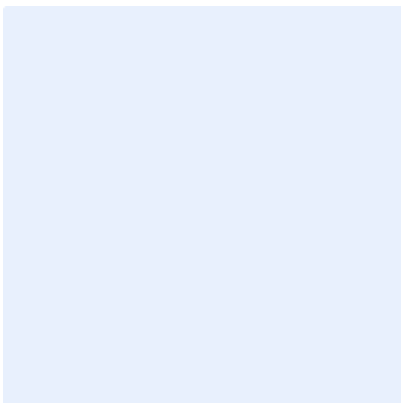
Training may include (but is not limited to) such matters as spill response and equipment, erosion and sediment control, and cultural awareness. No-one will be permitted to work on the site until they have completed the site induction process.

[Click here to type](#) - To be completed by the **Contractor**. Consider induction and onsite training requirements, such as Archaeological and Cultural Induction, Contaminated Land Identification and Response, Accidental Discovery Protocol, Spill Response, advice on flora and fauna, etc.

### 2.4 Site Description

[Click here to type](#) - To be completed by the **Environmental Planner**. Consider induction and onsite training requirements, such as Archaeological and Cultural Induction, Contaminated Land Identification and Response, Accidental Discovery Protocol, Spill Response, advice on flora and fauna, etc.

#### Map of Project Location



### 2.5 Project Description

[Click here to type](#) - To be completed by the **Designer**. Consider what the project entails, what is required, why the work is being carried out, what outcome(s) are to be achieved/avoided, etc. Identify key stakeholders for the project and their interests.

## 2.6 Regulatory Requirements

Click here to type - To be completed by the **Environmental Planner**. Describe consent/permitted activity rules that apply to the project, identify any additional consents required, and highlight key compliance requirement(s) i.e. discharge quality standards, excavation limits, exclusion areas, required experts, flora/fauna protection, etc.

## 2.7 Environmental Risk Assessment

Before any risks can be managed or controlled it is necessary to know the nature, likelihood, and impact of those risks. Risk Management involves the identification, assessment, control, monitoring and reporting of risks for the project. The Risk Assessment framework below consists of a Risk Assessment Matrix, and definitions for risk Likelihood and Impact. The use of these in combination provides a mechanism to consistently assess risk rating.

*Click here to type - To be completed by the **Design Team** as appropriate. Based on the 2.4 Site Description and the 2.6 Regulatory Requirements, describe the environmental risks/limitations that apply to the project. Use the Table 3- Risk Assessment Matrix to assign risk level to each Environmental Factor/Effect and record in*

Table 6 - Project Environmental Risks (see instructions in How to use this document on how to ensure this table then updates on front cover page) .Consider including a map/diagram of identified risks.

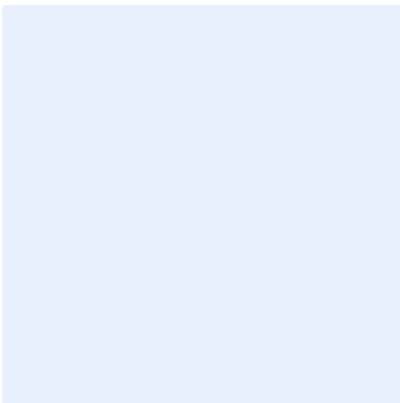


Table 3- Risk Assessment Matrix

		Impact				
		Insignificant	Minor	Moderate	Major	Extreme
Likelihood	Almost Certain	Medium	High	High	Very High	Very High
	Likely	Medium	Medium	High	Very High	Very High
	Possible	Low	Medium	High	High	Very High
	Unlikely	Low	Low	Medium	High	High
	Very Unlikely	N/A	Low	Medium	Medium	High

Table 4 - Risk Likelihood Definitions

Rating	Probability	Description
<b>Almost Certain</b>	> 90%	Virtually guaranteed to occur
<b>Likely</b>	> 70%	Will probably occur in most circumstances
<b>Possible</b>	> 40%	Common occurrence
<b>Unlikely</b>	> 10%	Could occur at some stage
<b>Very Unlikely</b>	< 10%	Some history of occurrence

### 2.7.1 Risk Impact Definitions

The impact assessment must consider short, medium, and long term impacts. Where a risk impact might encompass multiple environmental factors/effects, the highest impact must be used for the assessment.

All impacts (other than those identified as N/A) will require appropriate management and/or mitigation measures.

Table 5 - Risk Impact Definitions

Element	Insignificant	Minor	Moderate	Major	Extreme
<b>Environmental</b>		Moderate effects on biological or physical environment but little or quickly remedied impact to ecosystem.  Short term reversible damage	Serious environmental effects such as displacement of species and partial impairment of ecosystem.  Reversible but widespread medium term impact/damage.	Significant impact on highly valued species or habitats.  Reversible, but long term damage. Some impact not reversible	Long term destruction of highly significant ecosystem or very significant effects on endangered species or habitat.  Irreversible damage.
<b>Legislative</b>		Minor non-compliance with no legal / regulatory requirements.	Non-compliance with legal / regulatory requirements, or cessation of works.	Non-compliance with enforcement action, possible prosecution.	Prosecution.
<b>Financial</b>	Operational cost overrun up to \$2%	Operational cost overrun of between \$2% and \$5%	Operational cost overrun of between \$5% and \$25%	Operational cost overrun of between \$25% and \$50%	Operational cost overrun greater than \$50%.
<b>Reputational / Image</b>	No or negligible (one-off) media coverage or comment.	Minor short term media coverage with negative correlation and small/local audience	Negative media coverage with broader audience (regional and/or some national coverage) and involving more than one media agent. Short term focus (<5days).	Negative national media coverage with extended coverage (>5days) involving multiple news and media agents.	Sustained negative national and/or international media coverage, with focus investigative segments, re-occurring coverage and involving multiple news and media agents.

Element	Insignificant	Minor	Moderate	Major	Extreme
Customers	Negligible or isolated impact to customer(s) with no impact to normal levels of complaints	Impact to small groups of customers with some notable trend/similarity in complaints.	Community group impact with formal/justifiable complaints lodged or complaints in relation to public health.	A number of community groups affected (e.g. with some protest action)	Widespread impact to city population.

Table 6 - Project Environmental Risks

Environmental Factor <sup>3</sup>	Risk	Environmental Effect <sup>4</sup>	Risk
Rivers, Lakes, Streams and Drains	Risk level	Fish Passage/Salvage	Risk level
Groundwater and Springs	Risk level	Erosion and Sediment Control	Risk level
Flora and Fauna	Risk level	Dewatering	Risk level
Coastal Habitat and Processes	Risk level	Stormwater	Risk level
Protected Trees	Risk level	Dust and Air Quality	Risk level
Archaeology, Heritage & Cultural	Risk level	Noise	Risk level
Contaminated Land	Risk level	Vibration	Risk level
Coal Tar	Risk level	Hazardous Substances	Risk level
Asbestos	Risk level	Rehabilitation/Landscaping	Risk level
Wastewater	Risk level	Property Ownership	Risk level
Flowable Materials	Risk level	Waste Minimisation	Risk level
Additional Environmental Factor	Risk level	Additional Environmental effect.	Risk level

### 2.7.2 Other Effects

Click here to type - To be completed as required by the **Contractor and/or Design Team**. Consider elements such as odour, waste minimisation/recycling, project scheduling (i.e. to avoid inclement seasons/weather), any interrelationship with other considerations such as Health and Safety, Traffic Management, services, working hours etc.

<sup>3</sup> Generally denotes potential environmental risks that are present at the site prior to the project.

<sup>4</sup> Generally denotes potential environmental risks that are result from the works associated with the project.



### 3 Rivers, Lakes, Streams and Drains

#### 3.1 Environmental Risk Assessment

Rivers, Lakes, Streams and Drains	Risk level
-----------------------------------	------------

Surface waterbodies (rivers, streams, drains, lakes and wetlands) provide important habitat for many species of plants, fish, birds and animals, some of which are endemic and/or threatened. Some surface waterbodies are recognised as Statutory Acknowledgement Areas in the Ngāi Tahu Claims Settlement Act 1998, and most also provide opportunities for recreation activities.

To protect these values, water quality must be safeguarded and the natural flow of the watercourse maintained to the greatest possible extent. Where flow must be reduced or diverted, mitigation is required to ensure the values of the watercourse are not degraded.

Click here to type - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment** consider proximity to works, whether the watercourse will receive any discharges during/post construction, need for expert advice re: water quality/quantity, aquatic habitat/restoration, cultural values etc. May also require DOC, F&G, Iwi input. May require additional authorisation from ECan/DOC/MPI. **Note: works near Styx River may encounter Lamprey – seek freshwater ecologist advice.**

#### 3.2 Performance Standards

Click here to type - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

#### 3.3 Control Measures

Click here to type - To be completed by the **Contractor**. Consider performance standards and any expert advice received

Table 7 - Control Measures Rivers, Lakes, Streams & Drains

Type of Work	Risk	Control
Click here to add type of work	Select risk level	Click here to add control.

#### 3.4 Monitoring

Click here to type - To be completed by the **Contractor**.

#### 3.5 Reporting

Click here to type - To be completed by the **Contractor**.

#### 3.6 Contingency / Incident Response

Click here to type - To be completed by the **Contractor**.

## 4 Groundwater and Springs

### 4.1 Environmental Risk Assessment

Groundwater and Springs	Risk level
-------------------------	------------

‘Perched’ groundwater will respond rapidly to surface rainfall events, whereas the uppermost artesian aquifer (“Aquifer 1”) is typically found in Christchurch at approximately 20m deep. Aquifer 1 is hydraulically connected to the Waimakariri River and the spring-fed streams across Christchurch, and supplies residents with one of the best potable water supplies in the world.

Springs often provide important habitat for plants, fish, birds and animals, some of which are endemic and/or threatened. Works must therefore protect flows in spring-fed streams (i.e. Styx, Avon, and Heathcote Rivers), protect groundwater quality, and prevent saltwater intrusion.

Click here to type - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment** consider proximity of works, to springs, depth to groundwater and potential for dewatering, need for expert advice re: water quality/quantity, cultural values etc. May require Iwi input and/or additional authorisation.

### 4.2 Performance Standards

Click here to type - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

### 4.3 Control Measures

Click here to type - To be completed by the **Contractor**. Consider performance standards and any expert advice received

Table 8 - Control Measures Ground Water & Springs

Type of Work	Risk	Control
Click here to add type of work	Select risk level	Click here to add control.

### 4.4 Monitoring

Click here to type - To be completed by the **Contractor**.

### 4.5 Reporting

Click here to type - To be completed by the **Contractor**.

### 4.6 Contingency / Incident Response

Click here to type - To be completed by the **Contractor**.

## 5 Flora and Fauna

### 5.1 Environmental Risk Assessment

Flora and Fauna	Risk level
-----------------	------------

Christchurch and Banks Peninsular are home to many species of flora and fauna, some of which are endemic and/or threatened, such Canterbury Mudfish or Jewelled gecko. There are also pockets native bush and other rare habitats that have value in and of themselves, irrespective of any flora and fauna they might support. Modification of indigenous communities and habitats by humans is a major reason for the number of threatened plants and animals found in Canterbury.

[Click here to type](#) - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment** Consider need for expert advice re: protected habitat i.e. Ecological Heritage Site, wetlands, bird nesting, protected species (i.e. lizards, eels, penguins), and rehabilitation requirements for disturbed areas. May also require DOC, F&G, Iwi input. May require additional authorisation from DOC

### 5.2 Performance Standards

[Click here to type](#) - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

### 5.3 Control Measures

[Click here to type](#) - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 9 - Control Measures Flora & Fauna

Type of Work	Risk	Control
<a href="#">Click here to add type of work</a>	Select risk level	<a href="#">Click here to add control.</a>

### 5.4 Monitoring

[Click here to type](#) - To be completed by the **Contractor**.

### 5.5 Reporting

[Click here to type](#) - To be completed by the **Contractor**.

### 5.6 Contingency / Incident Response

[Click here to type](#) - To be completed by the **Contractor**.

## 6 Coastal Habitat and Processes

### 6.1 Environmental Risk Assessment

Coastal Habitat and Processes	Risk level
-------------------------------	------------

The coastline of Christchurch and Banks Peninsular encompasses habitats from sandy beaches and dunes to the small pocket beaches in the Peninsula’s bays. These features help support rich and diverse marine life and, in places, important marine fisheries. Some areas have associated cultural significance, and most provide opportunities for recreation activities.

Coastal environments are particularly sensitive to contamination, which can spread quickly on tidal waters and pollute large areas. Machinery can cause sedimentary compaction and long-term impacts on invertebrates. Careful planning is required to protect these values.

Click here to type - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment**. Consider need for expert advice re: habitat value and/or coastal processes. Consider the sensitivity of the coastal environment within or adjacent to the project area, e.g. wetlands, estuaries, roosting or nesting sites. May require additional authorisation from ECan.

### 6.2 Performance Standards

Click here to type - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

### 6.3 Control Measures

Click here to type - To be completed by the **Contractor**. Consider performance standards and any expert advice received

Table 10 – Control Measures Coastal Habitat and Processes

Type of Work	Risk	Control
Click here to add type of work	Select risk level	Click here to add control.

### 6.4 Monitoring

Click here to type - To be completed by the **Contractor**.

### 6.5 Reporting

Click here to type - To be completed by the **Contractor**.

### 6.6 Contingency / Incident Response

Click here to type - To be completed by the **Contractor**.

## 7 Protected Trees

### 7.1 Environmental Risk Assessment

Protected Trees	Risk level
-----------------	------------

Trees are a major part of the city’s character and amenity, and are an integral part of Christchurch's garden city image. There are many hundreds of protected trees distributed across Christchurch and Banks Peninsular. There are rules in the City Plan relating to protected trees, as well as trees in Council owned roads, parks, reserves and public open spaces. The Plan seeks to maintain and enhance the contribution of trees to the amenity of the community whilst also providing for the reasonable use and enjoyment of property.

Trees can also be identified as being significant because they have particular botanical, heritage, amenity, landscape, cultural, ecological and/or environmental values.

[Click here to type](#) - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment**. Consider need for expert advice from Council arborist. May require additional authorisation from CCC.

### 7.2 Performance Standards

[Click here to type](#) - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

### 7.3 Control Measures

[Click here to type](#) - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 11 - Control Measures Protected Trees

Type of Work	Risk	Control
<a href="#">Click here to add type of work</a>	Select risk level	<a href="#">Click here to add control.</a>

### 7.4 Monitoring

[Click here to type](#) - To be completed by the **Contractor**.

### 7.5 Reporting

[Click here to type](#) - To be completed by the **Contractor**.

### 7.6 Contingency / Incident Response

[Click here to type](#) - To be completed by the **Contractor**.

## 8 Archaeology, Heritage and Cultural

### 8.1 Environmental Risk Assessment

Archaeology, Heritage & Cultural	Risk level
----------------------------------	------------

Ōtautahi (Christchurch area) is important to Ngāi Tahu as an area of continuous occupation for around six centuries. Tautahi, who was one of the Ngāi Tahu chiefs who dispossessed the Ngāti Mamoe tribe, built his pa on the banks of the Ōtākaro (Avon River). The early settlement buildings and infrastructure help define the City and Peninsula’s unique architectural identity.

Christchurch City Council has the primary responsibility for protecting Christchurch’s and the Peninsula’s heritage on behalf of its residents.

Click here to type - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment**. Consider listed and unlisted Heritage sites, Silent Files, sites of cultural significance, and recorded archaeological sites etc. May require expert advice from a Heritage Advisor, MKT and/or an Archaeologist. May require additional authorisation from NZHPT or under the Heritage Rules in the District Plan.

### 8.2 Performance Standards

Click here to type - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity. Include Accidental Discovery Protocol if not superseded ([Construction Standard Specifications](#) Appendix 4)

### 8.3 Control Measures

Click here to type - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 12 – Control Measures Archaeology, Heritage & Cultural

Type of Work	Risk	Control
Click here to add type of work	Select risk level	Click here to add control.

### 8.4 Monitoring

Click here to type - To be completed by the **Contractor**.

### 8.5 Reporting

Click here to type - To be completed by the **Contractor**.

### 8.6 Contingency / Incident Response

Click here to type - To be completed by the **Contractor**.

## 9 Contaminated Land

### 9.1 Environmental Risk Assessment

Contaminated Land	Risk level
-------------------	------------

Land may be contaminated if it is (or has been) used for a hazardous activity or industry. Land where a listed hazardous activity or industry has taken place is referred to as HAIL land, such as orchards, market gardens, service stations, motor vehicle workshops, timber treatment sites, landfills, and some industrial sites. Hazardous substances from these activities may be present in the soil many years after the activity has ceased.

If contaminated material is encountered during construction, and/or if contaminated material is inappropriately managed, the risk of degrading human and environmental health is high.

[Click here to type](#) - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment**. If relevant to the project, will likely require expert advice. May require additional authorisation from ECan and/or CCC. **Note: If dewatering required within contaminated land, require a dewatering treatment and monitoring methodology as part of the Detailed Site Investigation report.**

### 9.2 Performance Standards

[Click here to type](#) - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity. Include standard Accidental Discovery Protocol if no consent granted.

### 9.3 Control Measures

[Click here to type](#) - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 13 - Control Measures Contaminated Land

Type of Work	Risk	Control
<a href="#">Click here to add type of work</a>	Select risk level	<a href="#">Click here to add control.</a>

### 9.4 Monitoring

[Click here to type](#) - To be completed by the **Contractor**.

### 9.5 Reporting

[Click here to type](#) - To be completed by the **Contractor**.

### 9.6 Contingency / Incident Response

[Click here to type](#) - To be completed by the **Contractor**.

## 10 Coal Tar

### 10.1 Environmental Risk Assessment

Coal Tar	Risk level
----------	------------

Coal tar is a by-product of the coal gasification and coal coking processes. Coal tar products were widely used for tar sealing Christchurch roads prior to 1970. Compared to the bitumen used in road construction today, coal tar contains about 5000 times greater concentrations of polycyclic aromatic hydrocarbons, or PAHs.

PAHs are known to have carcinogenic, mutagenic and teratogenic effects on humans and animals. Approximately half of Christchurch’s streets are contaminated with coal tar.

Click here to type - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment** Consider need for expert advice re: risk, mitigation, and/or disposal (options).

### 10.2 Performance Standards

Click here to type - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

### 10.3 Control Measures

Click here to type - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 14 - Control Measures Coal Tar

Type of Work	Risk	Control
Click here to add type of work	Select risk level	Click here to add control.

### 10.4 Monitoring

Click here to type - To be completed by the **Contractor**.

### 10.5 Reporting

Click here to type - To be completed by the **Contractor**.

### 10.6 Contingency / Incident Response

Click here to type - To be completed by the **Contractor**.



## 11 Asbestos

### 11.1 Environmental Risk Assessment

Asbestos	Risk level
----------	------------

Asbestos exposure can lead to a myriad of serious health problems, including asbestosis and lung cancer. Asbestos disease starts with the unknowing inhalation of microscopic asbestos fibres. Fibres can remain airborne for hours, placing anyone nearby at risk. Once inhaled, the fibres become lodged in the thin lining surrounding the lungs and cause inflammation, making breathing difficult. This eventually cause scarring, which can lead to mutations and cancer.

Asbestos exposure can happen wherever asbestos is present, which can include pipes, buildings/cladding, and even buried below structures. Protection of workers and the public is critical.

Click here to type - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment**. If relevant to the project, will likely require expert advice re: risk, mitigation, and/or disposal (options).

### 11.2 Performance Standards

Click here to type - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

### 11.3 Control Measures

Click here to type - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 15 - Control Measures Asbestos

Type of Work	Risk	Control
Click here to add type of work	Select risk level	Click here to add control.

### 11.4 Monitoring

Click here to type - To be completed by the **Contractor**.

### 11.5 Reporting

Click here to type - To be completed by the **Contractor**.

### 11.6 Contingency / Incident Response

Click here to type - To be completed by the **Contractor**.

## 12 Wastewater

### 12.1 Environmental Risk Assessment

Wastewater	Risk level
------------	------------

Wastewater can contain biological agents such as bacteria, viruses, fungi and parasites that can cause serious illnesses (i.e. Tetanus, Septicaemia, Meningitis, Leptospirosis, and Hepatitis) and even death. There is also a risk from unknown chemicals (i.e. solvents, pesticides) and from toxic, irritating, asphyxiating or flammable gases in confined spaces.

The risk to health depends on the microbes present, duration of exposure and method of exposure. Exposure modes can include direct contact, or indirect contact such as cross-contamination of clothes, equipment or drinking water. Wastewater can also cause significant environmental harm and amenity loss in surface water and/or via soakage to groundwater.

[Click here to type](#) - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment** Consider wastewater diversion/over-pumping, potential contamination risk (i.e. potable water) etc.

### 12.2 Performance Standards

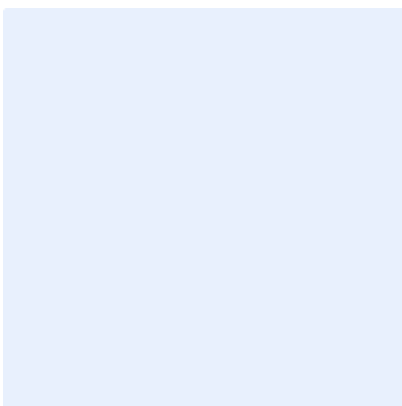
[Click here to type](#) - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or operational constraint imposed by the Wastewater Treatment Plant Control Room.

### 12.3 Control Measures

[Click here to type](#) - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include any Management Plan detail required to meet consent conditions.

Table 16 - Control Measures Wastewater

Type of Work	Risk	Control
<a href="#">Click here to add type of work</a>	Select risk level	<a href="#">Click here to add control.</a>



### 12.4 Monitoring

[Click here to type](#) - To be completed by the **Contractor**.

## 12.5 Reporting

[Click here to type](#) - To be completed by the **Contractor**.

## 12.6 Contingency / Incident Response

[Click here to type](#) - To be completed by the **Contractor**.

## 13 Flowable Materials

### 13.1 Environmental Risk Assessment

Flowable Materials	Risk level
--------------------	------------

Flowable material is any cohesive ‘slurry’ that can be used to fill (or backfill) voids. Common examples might include: filling around bridge abutments or retaining walls; structural fill under foundations (i.e. site concrete); filling disused storage tanks or pipes; or restricted access sites.

If flowable materials are not well contained, they can inadvertently leak into the environment and/or pipes or other inappropriate structures/locations, causing significant damage, costly delays and reputational harm for those involved.

Click here to type - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment** Consider risk of unidentified flow paths, volumes required to fill expected area, and potential contamination risk if spilled or allowed to flow outside required area. **Note: For directional drilling, consider bentonite breakout, especially in proximity to sensitive receptors such as waterways or wetlands.**

### 13.2 Performance Standards

Click here to type - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

### 13.3 Control Measures

Click here to type - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 17 - Control Measures Flowable Materials

Type of Work	Risk	Control
Click here to add type of work	Select risk level	Click here to add control.

### 13.4 Monitoring

Click here to type - To be completed by the **Contractor**.

### 13.5 Reporting

Click here to type - To be completed by the **Contractor**.

### 13.6 Contingency / Incident Response

Click here to type - To be completed by the **Contractor**.

## 14 Fish Passage/Salvage

### 14.1 Environmental Risk Assessment

Fish Passage/Salvage	Risk level
----------------------	------------

Many iconic fish species, such as whitebait, eels and salmon, need to move between rivers and the sea to complete their lifecycles. They also frequently migrate up and downstream between different freshwater habitats. If these movements are delayed or blocked, fish may be unable to reach critical habitats for completing their lifecycle.

Permanent and temporary structures/diversions, and works in waterways during construction, are commonly found in streams and rivers throughout Christchurch and Banks Peninsular. If these are poorly designed, or installed incorrectly, they can obstruct essential fish migrations.

Click here to type - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment**. Consider need for expert advice (DOC, F&G, Iwi) re: aquatic habitat/values, fish spawning habitat/timeframes, cultural values, effects of discharges/diversions. May require additional authorisation from ECan/DOC.

### 14.2 Performance Standards

Click here to type - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

### 14.3 Control Measures

Click here to type - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 18 - Control Measures Fish Passage/Salvage

Type of Work	Risk	Control
Click here to add type of work	Select risk level	Click here to add control.

### 14.4 Monitoring

Click here to type - To be completed by the **Contractor**.

### 14.5 Reporting

Click here to type - To be completed by the **Contractor**.

### 14.6 Contingency / Incident Response

Click here to type - To be completed by the **Contractor**.

## 15 Erosion and Sediment Control

### 15.1 Environmental Risk Assessment

Erosion and Sediment Control	Risk level
------------------------------	------------

Construction related activities exacerbate soil erosion rates significantly. This is because disturbed soils are more easily detached from the ground surface via wind, rain or water action. Consequently, if best practice controls are not established to mitigate this increase in erosion, significant adverse environmental effects may occur in the receiving environment.

The underwriting principle of erosion and sediment control is to reduce the potential effects of erosion and sedimentation. Following the paradigm that prevention is better than cure, measures to avoid or reduce erosion are far more effective at minimising adverse effects than sedimentation controls.

[Click here to type](#) - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment** Consider need for expert advice.

### 15.2 Performance Standards

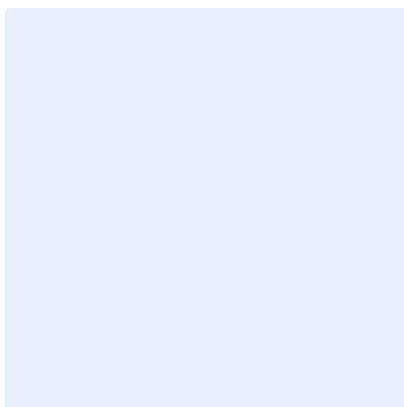
[Click here to type](#) - To be completed by the **Environmental Planner**, refer ECan’s Erosion and Sediment Control Guideline and append any relevant consent and/or permitted activity.

### 15.3 Control Measures

[Click here to type](#) - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 19 - Control Measures Erosion & Sediment Control

Type of Work	Risk	Control
<a href="#">Click here to add type of work</a>	Select risk level	<a href="#">Click here to add control.</a>



### 15.4 Monitoring

[Click here to type](#) - To be completed by the **Contractor**.

## 15.5 Reporting

[Click here to type](#) - To be completed by the **Contractor**.

## 15.6 Contingency / Incident Response

[Click here to type](#) - To be completed by the **Contractor**.

## 16 Dewatering

### 16.1 Environmental Risk Assessment

Dewatering	Risk level
------------	------------

Groundwater inflow can cause piping, heave and/or reduction in the stability of an excavation. High groundwater table can cause foundation soils to become unable to support a structure. Dewatering is used to locally lower the groundwater table on sites that have a high water table, and where dry conditions are necessary in order to carry out construction work.

The selection and use of any dewatering system needs to suit the characteristics of the aquifer and the conditions on site. Understanding the local aquifer system is also important in planning and avoiding effects on surrounding structures, other groundwater users, and the environment.

Click here to type - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment** Consider location, rate and duration of take, effects on nearby bores or springs, stream depletion effects, receiving environment for discharged water quality. May require additional authorisation from ECan.

**Note: If dewatering required within contaminated land, require a dewatering treatment and monitoring methodology as part of the Detailed Site Investigation report.**

### 16.2 Performance Standards

Click here to type - To be completed by the **Environmental Planner**, refer CCC Dewatering Guideline (Nov. 2016) and append any relevant consent and/or permitted activity.

### 16.3 Control Measures

Click here to type - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 20 - Control Measures Dewatering

Type of Work	Risk	Control
Click here to add type of work	Select risk level	Click here to add control.

### 16.4 Monitoring

Click here to type - To be completed by the **Contractor**.

### 16.5 Reporting

Click here to type - To be completed by the **Contractor**.

### 16.6 Contingency / Incident Response

Click here to type - To be completed by the **Contractor**.



## 17 Stormwater

### 17.1 Environmental Risk Assessment

Stormwater	Risk level
------------	------------

Stormwater refers to rain water runoff from disturbed (construction phase) or developed (post construction) surfaces. Human activities (particularly earthworks, industry and traffic) generate sediments and other contaminants that are eventually flushed into receiving environments during rain events. These sediments and contaminant can accumulate in rivers, estuaries and harbours. Stormwater is therefore a major source of concern for the human and natural environment because of its potential effects on the ecological health of our urban streams and coastal waters, as well as on the economic, social and cultural value of these environments.

[Click here to type](#) - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment** consider location, rate, quality and duration of stormwater discharges (pre-post construction) etc. May require additional authorisation from ECan.

### 17.2 Performance Standards

[Click here to type](#) - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

### 17.3 Control Measures

[Click here to type](#) - To be completed by the **Contractor**. Consider performance standards and any expert advice received

Table 21 - Control Measures

Type of Work	Risk	Control
<a href="#">Click here to add type of work</a>	Select risk level	<a href="#">Click here to add control.</a>

### 17.4 Monitoring

[Click here to type](#) - To be completed by the **Contractor**.

### 17.5 Reporting

[Click here to type](#) - To be completed by the **Contractor**.

### 17.6 Contingency / Incident Response

[Click here to type](#) - To be completed by the **Contractor**.

## 18 Dust and Air Quality

### 18.1 Environmental Risk Assessment

Dust and Air Quality	Risk level
----------------------	------------

Dust from construction activities, vehicle movements and/or stockpiles can contribute to sediment runoff as well as creating a nuisance to the public, neighbouring properties, adjoining roads and transmission lines. Similarly, odour and plant/vehicle fumes can be offensive to nearby sensitive receptors. Suitable controls are required to avoid offensive or objectionable effects of dust and fumes both on site and in the surrounding environment.

[Click here to type](#) - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment**. Consider potential sensitive receptors, local prevailing wind conditions, soil types, size and duration of exposed area(s)/stockpile(s) etc. Consider air discharges from non-mobile plant, odour, etc. May require expert advice and/or additional authorisation from ECan.

### 18.2 Performance Standards

[Click here to type](#) - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

### 18.3 Control Measures

[Click here to type](#) - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Consider elements such as weather forecasting, wind speed measurement and work limits, etc. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 22- Control Measures Dust and Air Quality

Type of Work	Risk	Control
<a href="#">Click here to add type of work</a>	Select risk level	<a href="#">Click here to add control.</a>

### 18.4 Monitoring

[Click here to type](#) - To be completed by the **Contractor**.

### 18.5 Reporting

[Click here to type](#) - To be completed by the **Contractor**.

### 18.6 Contingency / Incident Response

[Click here to type](#) - To be completed by the **Contractor**.

## 19 Noise

### 19.1 Environmental Risk Assessment

Noise	Risk level
-------	------------

Construction projects may require the use of large static and/or mobile mechanical equipment and processes. These types of machinery are likely to generate elevated levels of noise for extended durations that may be considered offensive or objectionable by surrounding sensitive receptors. Conversely, remote location of noisy activities and/or greater distances to sensitive receptors will minimise potential risks associated with noise nuisance.

[Click here to type](#) - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment** Consider potential sensitive receptors, noise level assessment for plant and machinery, and/or need for expert advice.

### 19.2 Performance Standards

Construction activities shall meet relevant noise limits specified under Permitted Activity Rule 6.1.6.1.1. Tables 2 and 3 of [NZS 6803:1999 Acoustics - Construction Noise](#), when measured and assessed in accordance with that standard (See Table 25 below).

[Click here to type](#) - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

### 19.3 Control Measures

[Click here to type](#) - To be completed by the **Contractor**. Consider performance standards and any expert advice received Include sufficient detail to meet the requirements of any Management Plan required by consent conditions, Refer: Table 25 - Guideline construction noise limits.

Table 23 - Predicted noise levels for significant types of work

Type of Work	Nearest receiver and distance	Predicted Noise Level	Comment on compliance
<a href="#">Click here to add type of work</a>	<a href="#">Click here to add receiver.</a>	<a href="#">Click here to add noise level.</a>	<a href="#">Click here to add compliance comment.</a>

### 19.4 Monitoring

[Click here to type](#) - To be completed by the **Contractor**.

Table 24- Noise Monitoring Equipment

Equipment	Make	Model	Serial Number	Verification Date
Sound level metre and microphone	<a href="#">Click here to add Make</a>	<a href="#">Click here to add Model</a>	<a href="#">Click here to add serial number.</a>	<a href="#">Click here to enter a date.</a>

### 19.5 Reporting

[Click here to type](#) - To be completed by the **Contractor**.

### 19.6 Contingency / Incident Response

[Click here to type](#) - To be completed by the **Contractor**.

Table 25 - Guideline construction noise limits

Time of Week	Time period	Duration of works at location					
		Less than 14 days		Less than 20 weeks		More than 20 weeks	
		L <sub>Aeq(t)</sub>	L <sub>AFmax</sub>	L <sub>Aeq(t)</sub>	L <sub>AFmax</sub>	L <sub>Aeq(t)</sub>	L <sub>AFmax</sub>
Noise limits in residential areas							
Weekdays	0630 - 0730	65 dB	75 dB	60 dB	75 dB	55 dB	75 dB
	0730 - 1800	80 dB	95 dB	75 dB	90 dB	70 dB	85 dB
	1800 - 2000	75 dB	90 dB	70 dB	85 dB	65 dB	80 dB
	2000 - 0630	45 dB	75 dB	45 dB	75 dB	45 dB	75 dB
Saturdays	0630 - 0730	45 dB	75 dB	45 dB	75 dB	45 dB	75 dB
	0730 - 1800	80 dB	95 dB	75 dB	90 dB	70 dB	85 dB
	1800 - 2000	45 dB	75 dB	45 dB	75 dB	45 dB	75 dB
	2000 - 0630	45 dB	75 dB	45 dB	75 dB	45 dB	75 dB
Sundays and Public Holidays	0630 - 0730	45 dB	75 dB	45 dB	75 dB	45 dB	75 dB
	0730 - 1800	55 dB	85 dB	55 dB	85 dB	55 dB	85 dB
	1800 - 2000	45 dB	75 dB	45 dB	75 dB	45 dB	75 dB
	2000 - 0630	45 dB	75 dB	45 dB	75 dB	45 dB	75 dB
Noise limits in commercial or industrial areas							
	0730 - 1800	80 dB	-	75 dB	-	70 dB	-
	1800 - 0730	85 dB	-	80 dB	-	75 dB	-

## 20 Vibration

### 20.1 Environmental Risk Assessment

Vibration	Risk level
-----------	------------

Construction projects may require the use of heavy mechanical plant and equipment. These types of machinery, such as excavators, mobile cranes, and impact rollers, are capable of generating significant ground vibration effects. Excessive ground vibration can destabilise or damage surrounding structures, and may require pre- and post-construction condition surveys to determine whether there have been any construction related vibration effects on the surrounding natural and human environments.

[Click here to type](#) - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment**. Consider potential sensitive receptors, vibration assessment for plant and machinery, and/or need for expert advice.

### 20.2 Performance Standards

[Click here to type](#) - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

### 20.3 Control Measures

[Click here to type](#) - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 26 - Control Measures Vibration

Type of Work	Risk	Control
<a href="#">Click here to add type of work</a>	Select risk level	<a href="#">Click here to add control.</a>

### 20.4 Monitoring

[Click here to type](#) - To be completed by the **Contractor**.

### 20.5 Reporting

[Click here to type](#) - To be completed by the **Contractor**.

### 20.6 Contingency / Incident Response

[Click here to type](#) - To be completed by the **Contractor**.

## 21 Hazardous Substances

### 21.1 Environmental Risk Assessment

Hazardous Substances	Risk level
----------------------	------------

By their very nature hazardous substances can be extremely dangerous. Used incorrectly they can cause catastrophic accidents, such as fires and explosions, and serious harm to people who are exposed to them. Occupational exposure to hazardous substances may occur over many years and result in slow and debilitating diseases, many of which are fatal.

Specific controls are required to help manage the risks associated with using, handling or storing hazardous substances in the workplace and to protect the health and safety of workers and the environment. All hazardous substances stored on site, particularly overnight, pose a risk as (unintentional) discharges can have significant impacts on humans and the environment. Security is an important consideration in addition to appropriate bund capacity.

[Click here to type](#) - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment**. Consider materials brought to site such as fuels/lubricants, paints, flocculant, polymer, etc.

### 21.2 Performance Standards

[Click here to type](#) - To be completed by the **Environmental Planner**, refer and append any relevant consent permitted activity and/or national standard.

### 21.3 Control Measures

[Click here to type](#) - To be completed by the **Contractor**. Consider performance standards and any expert advice received

Table 27 – Control Measures Hazardous Substances

Type of Work	Risk	Control
<a href="#">Click here to add type of work</a>	Select risk level	<a href="#">Click here to add control.</a>

### 21.4 Monitoring

[Click here to type](#) - To be completed by the **Contractor**.

### 21.5 Reporting

[Click here to type](#) - To be completed by the **Contractor**.

### 21.6 Contingency / Incident Response

[Click here to type](#) - To be completed by the **Contractor**.

## 22 Rehabilitation/Landscaping

### 22.1 Environmental Risk Assessment

Rehabilitation/Landscaping	Risk level
----------------------------	------------

Temporary and permanent landscape and visual effects may occur as a result of the project. The visual effects of removal of existing vegetation, landforms or structures, or creation of new features, may have short to long term effects, particularly sensitive locations. Similarly, vehicle movement, site office/facilities, and temporary stockpiles can disturb existing landforms and necessitate remediation works.

Click here to type - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment**. Consider importance of stabilisation, species selection, habitat reinstatement/creation, pest species control/protection, maintenance period, etc. Consider need for expert advice. Landscape requirements must be specified on the construction plans, including depth and location of plants, mulch types and planting media etc. (as advised by project Landscape Architect).

### 22.2 Performance Standards

Click here to type - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

### 22.3 Control Measures

Click here to type - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 28 - Control Measures Rehabilitation/Landscaping

Type of Work	Risk	Control
Click here to add type of work	Select risk level	Click here to add control.

### 22.4 Monitoring

Click here to type - To be completed by the **Contractor**.

### 22.5 Reporting

Click here to type - To be completed by the **Contractor**.

### 22.6 Contingency / Incident Response

Click here to type - To be completed by the **Contractor**.

## 23 Property Ownership

### 23.1 Environmental Risk Assessment

Property Ownership	Risk level
--------------------	------------

Property ownership also encapsulates land, assets, service and infrastructure. Property owners have a right to know and fully understand what is (or will be) occurring on or near their property. Owners can be affected directly (such as when works are required on their property, or noise levels will be unavoidable high and in close proximity) or indirectly (such as road closures that restrict access to their property). Where landowners may be directly affected, written person from the affected owner(s) is typically required prior to works. Engagement with landowners should be based on a policy of ‘no surprises’.

[Click here to type](#) - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment** Consider need for landowner approvals

### 23.2 Performance Standards

[Click here to type](#) - To be completed by the **Environmental Planner**, refer and append any relevant consent, permitted activity and/or written permission.

### 23.3 Control Measures

[Click here to type](#) - To be completed by the **Contractor**. Consider performance standards and any expert advice received and any landowner specific requirements/agreements.

Table 29 - Control Measures Property Ownership

Type of Work	Risk	Control
<a href="#">Click here to add type of work</a>	Select risk level	<a href="#">Click here to add control.</a>

### 23.4 Monitoring

[Click here to type](#) - To be completed by the **Contractor**.

### 23.5 Reporting

[Click here to type](#) - To be completed by the **Contractor**.

### 23.6 Contingency / Incident Response

[Click here to type](#) - To be completed by the **Contractor**.



## 24 Waste Minimisation

### 24.1 Environmental Risk Assessment

Waste Minimisation	Risk level
--------------------	------------

To create a healthy and prosperous city Christchurch City Council is seeking to eliminate all harmful materials and chemicals from its public infrastructure. Christchurch City Council has developed a Resource Efficiency and Greenhouse Gas Emission Policy which must be considered as part of all Council projects. This practise will ensure new infrastructure is healthy for people and nature, and taking a precautionary approach will help mitigate the future burden of managing and removing harmful materials and the burden on society of caring for those affected.

Measures to minimise waste production, appropriately manage waste generated within the project area, and the future repurposing of products used on each project are key considerations throughout project design and delivery.

### 24.2 Performance Standards

As a minimum, provision shall be made to separate waste streams to promote recycling and minimise landfill waste. In addition, the use of copper (for roofs, facades, downpipes and other architectural features) and zinc, especially on roofs, have a significant detrimental effect on life in waterways. Where possible these materials should be avoided where they are subject to rainwater that drains surface water.

### 24.3 Control Measures

[Click here to type](#) - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 30 - Control Measures

Type of Work	Risk	Control
<a href="#">Click here to add type of work</a>	Select risk level	<a href="#">Click here to add control.</a>

### 24.4 Monitoring

[Click here to type](#) - To be completed by the **Contractor**.

### 24.5 Reporting

[Click here to type](#) - To be completed by the **Contractor**.

## 25 Click here enter Heading

### 25.1 Environmental Risk Assessment

Click here to type - To be completed as required by the **Design Team**, refer to section **2.7 Environmental Risk Assessment**

### 25.2 Performance Standards

Click here to type - To be completed by the **Environmental Planner**, refer and append any relevant consent and/or permitted activity.

### 25.3 Control Measures

Click here to type - To be completed by the **Contractor**. Consider performance standards and any expert advice received. Include sufficient detail to meet the requirements of any Management Plan required by consent conditions.

Table 31 - Control Measures

Type of Work	Risk	Control
Click here to add type of work	Select risk level	Click here to add control.

### 25.4 Monitoring

Click here to type - To be completed by the **Contractor**.

### 25.5 Reporting

Click here to type - To be completed by the **Contractor**.

### 25.6 Contingency / Incident Response

Click here to type - To be completed by the **Contractor**.

## 26 Communication

### 26.1 Complaints Procedure

In the absence of any project specific Communication Plan, the following procedure shall be followed for all complaints:

- All complaints should be immediately directed to the person listed in 2.2 Roles and Responsibilities or the CCC Project Manager.
- It is important that any interaction with the complainant is polite and does not belittle their concern.
- As soon as the complaint is received it will be recorded on the project complaints register (See Appendix B)
- An initial response will be made and recorded. Depending on the nature of the complaint the initial response could be to immediately cease the type of work pending investigation, replace an item of equipment, apply additional control (e.g. water sprayer for dust), or reinstate a damaged control device. However, in some cases it might not be practicable to provide immediate relief. CCC and the complainant will be informed of actions taken.
- Where the initial response does not address the complaint, the CCC Manager will be informed and will undertake (either themselves or delegated to the Contractor) further investigation, corrective action and follow-up monitoring as appropriate. The complainant will be advised of the outcome of this process.
- All actions will be recorded on the project complaints register and the complaint will then be closed.

Table 32 - Complaint Recording

Information	Timeframe
Complaint received	Within twenty-four hours
Complaint closed	Within one week of receipt

### 26.2 Documentation

All paper/electronic files relating to this Environmental Risk Assessment & Monitoring Plan (EMP) will be kept in the Site Office. This will include:

- A copy of this EMP and all Appendices
- Consultation and complaints registers
- Monitoring/auditing reports
- Signed training/induction records which show that people inducted onto site understand what is required of them under this EMPs

## 27 Updating the EMP

This EMP is a live document and may be updated at any time, with the necessary approval, throughout the course of the project. This EMP must be amended if any of the following occur:

- The scope of works or methodology is going to change
- The mitigation measures are not working sufficiently
- Responsible parties change
- The environmental conditions change
- The area of works increases or changes
- You have identified improvements to the process or mitigation measures
- The authorisations relevant to the project change
- Anything else changes that alters the effectiveness of this EMP to manage the (potential) environmental effects of your works

Any amendments shall only be for the purpose of improving the effectiveness of the EMP. Reasons for making changes to the EMP will be documented.

## A. Appendix - Resource Consents, Permitting Activities and other Authorisations

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## B. Appendix – Complaints Register

Click here to enter text. **Contractor** to add

## C. Appendix – Noise/Vibration Schedules, Managements Plans Etc

As required.

[Click here to enter text.](#) **Contractor** to add.