

# Environmental Management Plan (Rev B)

**Godley Peaks Station Homestead** 

# July 2024

# enviroscope





Document Control	
Title	Environmental Management Plan
Address	Godley Peaks Station, Godley Peaks Road, Lake Tekapo
Consent Number	ТВС
Client	Warren Lewis
Our Reference	24009
Prepared by And	Will Thomson (BAppSc, MSusBus) Environmental Consultant Marandisk Tom Grandiek (BAppSc, CEnvP)
	Senior Environmental Consultant

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#### Disclaimer

Enviroscope has exercised due skill, care, and attention in preparing this EMP on the basis of their understanding of the subject site through their own site visits as well as information provided by the client and its consultants. Enviroscope has no control over the physical actions, detailed design, equipment, services, and methodologies undertaken by the client or other third parties tasked with implementing Enviroscope's instructions or recommendations. Enviroscope does not accept any responsibility for any environmental incidents or other defects of control measures if there is any departure or variance from the measures detailed in this EMP and any supporting documentation.



#### **Emergency Contacts**

Emergency contacts associated with this project are provided in **Table 1**. Contact made with any of the following shall be undertaken with due consultation of the Environmental Representative or Project Manager.

 Table 1: Emergency Contacts.

Element	Emergency Contact	Details
Pollution incident	Environment Canterbury Regional Council (ECan) Hotline	0800 765 588 <i>'Snap, Send, Solve'</i> smartphone app
Environmental complaint	Environmental Representative	ТВС
Discovery of contaminated land	Environmental Representative	
Unexpected heritage finds	Environmental Representative	
Human remains	New Zealand Police	111
Fire including bushfire	Fire and Emergency New Zealand (FENZ)	111
Public utilities	Mackenzie District Council (MDC)	(03) 685 9010 <u>info@mackenzie.govt.nz</u>
Internal contacts	Project Manager	ТВС
Internal contacts	Environmental Consultant	Tom Grandiek Enviroscope 027 2633 113

#### **1.0** INTRODUCTION

#### 1.1 Purpose and Scope

On behalf of Warren Lewis, Enviroscope has prepared this Environmental Management Plan (EMP) for the construction of the Godley Peaks Homestead at Godley Peaks Station in Mackenzie District, Canterbury. This EMP aims to reduce the effects of the project's construction activities on the environment and sensitive receptors.

This EMP is prepared in accordance with the objectives and policies of the Mackenzie District Council (MDC) Operative and Proposed District Plans. This document will also ensure that the project aligns with Environment Canterbury's (ECan) "Erosion and Sediment Control Toolbox for the Canterbury Region" (ESCT).

The purpose of this EMP is to be an effective and practical reference manual for construction personnel that applies to all project activities during the construction phase and includes the following:

- Strategies to manage environmental aspects and risks, based on associated best practice.
- Provides for contingency planning.
- Provides a framework for monitoring, reporting, review and continual improvement.
- Defines roles and responsibilities.
- Procedures to investigate and resolve environmental non-conformances and initiate corrective and preventative actions.

An overview of the project and sequencing can be found in the construction methodology at Section 2.0.

#### 1.2 Site Overview

The site, which is legally described as Part Run 80, is situated on the eastern perimeter of Godley Peaks Station (a working sheep and beef station) in the Mackenzie District, Canterbury. It can be accessed off 1,729 Godley Peaks Road, Lake Tekapo. The surrounding area has been extensively modified as part of farming activity, with vegetative cover generally characterised by alpine tussock, grey shrubland (including native matagouri), and cultivated pasture and fodder crops. The subject site itself is situated on well-developed pasture that is currently being used to grow barley.

Site topography can be described as gently rolling, with the proposed building platform sitting atop a raised knoll with an east-facing aspect. A shallow natural basin is situated to the east between the site and Lake Tekapo, which is located approximately 230 m east of the proposed earthworks extent. Cass River, which feeds into Lake Tekapo, is situated approximately 600 m south of the site at its nearest point. Micks Lagoon lies approximately 500 m to the north-west of the site, and outlets into Cass River via a small stream which runs past the western site boundary. An unidentified wetland is also located approximately 250 m north-east of the site.

The site is shown in **Figure 1** below.



Figure 1: Location of the site (Source: Canterbury Maps Viewer)

#### 1.2.1 Soils and Geotechnical Summary

A geotechnical report has been prepared by Geotago (dated July 2024) which details site investigations and reports on the geotechnical conditions, including drainage potential. The report notes that "topsoil comprises organic sandy SILT, and gravelly sandy SILT, dark brown, with roots to depths of approximately 0.3 m. Alluvium underlies the topsoil in all of the test pits to depths of between 0.5 and 1.4 m. The alluvium comprises sandy SILT and sand with gravels, being brown in colour and very stiff. There was evidence of topsoil mixing in the upper layer of the alluvial, likely from a long history of farming activity... Glacial deposits were encountered in all test pits below the alluvial soils. The 'till' was described as silty SAND with gravels and cobbles, coarsening with depth to form sandy GRAVELS with cobbles. All the glacial till was described as dense to very dense with a 5T excavator failing to penetrate the material much beyond 2m."

The Geotago report also discusses preliminary soakage testing undertaken to determine suitability for stormwater disposal, determining a factored soakage rate of <25 mmm/hr from 1,000L of water discharge into the test pit. The report noted an initial drop in water level attributed to dry soils, followed by a period of >6hrs with no change in water level. As such, soakage to ground is unlikely to be relied upon throughout the project.



The regional groundwater table was not encountered during test pit excavation, and is therefore not anticipated to be encountered during construction.

#### 1.2.2 Summary of Earthworks

A total of approximately 17,800 m<sup>3</sup> of material will be excavated and the majority of this will be utilised on site (16,300 m<sup>3</sup>). Earthworks will occur progressively over a total extent of 4.5 hectares. The extent of earthworks is depicted on the Erosion and Sediment Control (ESCP) drawing in **Appendix 1**.

#### 1.3 Associated Resource Consents

This EMP has been prepared to ensure that all relevant conditions of associated resource consents will be addressed. Provided the project undertakes its operations in accordance with this EMP, it will comply with the relevant conditions. The resource consents associated with this project are given in **Table 2**.

#### Table 2: Associated resource consents.

Resource Consent Number	Related Council	Activity Description	Date of Decision Issue
ТВС	ECan		
ТВС	MDC		

#### 1.5 Suitably Qualified and Experienced Professional

This EMP has been prepared by Tom Grandiek of Enviroscope Limited. Tom is a certified Environmental Professional (CEnvP) and holds a Bachelor of Applied Sciences degree, majoring in Environmental Management. He spent five years working in RMA compliance with local government. Tom has extensive experience in the preparation and monitoring of EMPs and ESCPs.

Tom meets the criteria of a Suitably Qualified and Experienced Professional (SQEP) for the purposes of preparing this EMP and overseeing the environmental aspects of this project.

#### 2.0 CONSTRUCTION METHODOLOGY

#### 2.1 Sequencing of Works

The following sequencing will ensure the earthworks are undertaken efficiently while ensuring good environmental outcomes. This is a preliminary staging methodology and may be subject to change based on site conditions encountered during construction. This methodology shall be read in conjunction with the Erosion and Sediment Control Plan (ESCP) attached as **Appendix 1**.

#### Preliminary works and site establishment (prior to as-built confirmation)

- Ensure the current EMP is available onsite and complete site induction with Environmental Consultant.
- Establish site laydown.
- Establish silt fence below proposed extent of fill batters as depicted in ESCP-001, Appendix 1.
- Install clean water diversion bunds (CWDBs).
- Construct sediment basins in accordance with design specifications and calculations provide in Appendix 2.

#### **Bulk earthworks**

- Commence construction of the upgrading of the existing access. Undertake works in a progressive manner working
  from the south to the north, with AP65 aggregate applied to the surface to reduce the exposed surface area. Batters
  formed below the road alignment are to be topsoiled and re-seeded as soon as possible to reduce exposed surface
  area.
- Install the dirty water diversion channel on the inside of the driveway alignment as works progress in accordance with final design specifications, installing check dams at 12-metre intervals. This channel shall be culverted across the access and discharge into SB2.
- Install DWDCs along the base of the proposed building platform and landscape fill footprints and tie into SB1. Install drop-out pits and check dams alternating at 12-metre intervals.
- Commence cut-to-fill of the main building platform and landscape fill area. As works progress, ensure the DWDC extends around the edge of the cut footprint and ties into the DWDC network as indicated on ESCP-001, Appendix 1. Ensure that the building platform is graded southwards. It is recommended that the building platform be progressively capped with clean aggregate to reduce erosive potential of the surface. The landscape fill area shall be stabilised with topsoil and reseeded and or planted with final landscape plantings.

#### Landscaping and revegetation

• Undertake final landscaping and revegetation of any remaining exposed areas.

#### Decommissioning

• Remove erosion and sediment control devices once stabilisation has occurred across the entire site. This is generally defined as 80% vegetative cover.



#### 2.2 Hours of Operation

Construction activities and the associated hours of operation shall comply with *NZS 6803:1999 Acoustics - Construction Noise Guidelines*. Site works may be undertaken between 0730 and 1800 hours, Monday to Saturday. No works are to be undertaken on Sundays or Public Holidays. However, this does not preclude any emergency works or works required for incident investigation or response. Additional detail relating to noise-producing activities are to be undertaken in accordance with **Section 7.0** of this EMP.

#### **3.0 EMP IMPLEMENTATION**

#### 3.1 Environmental Roles and Responsibilities

#### 3.1.1 Project Manager

The Project Manager is responsible for the effective implementation of the EMP and has overall responsibility for the environmental performance of the project. Duties include:

- Ensuring adequate resources are in place to implement the EMP.
- Ensuring all staff and sub-contractors operate within the guidelines of the EMP.
- Ensuring that an EMP is prepared and that environmental standards, processes and procedures meet relevant resource consent conditions.
- Overseeing the successful implementation, monitoring and review of the EMP.
- Ensuring that inspections are carried out in accordance with the relevant EMP.
- Restricting or stopping any activity that has the potential to or has caused adverse environmental effects.
- Providing notification and reporting of Environmental Incidents to Council and other environmental reports as required by resource consent.
- Delegating authority of the above responsibilities.

#### 3.1.2 Environmental Representative

The Environmental Representative supports the Project Manager in the day-to-day implementation of the EMP. Duties include:

- Ensuring the installation of environmental controls as per the EMP.
- Undertaking environmental site inspections.
- Undertake water quality sampling during rainfall events.
- Overseeing the maintenance and improvement of defective environmental controls.
- Providing environmental inductions to all staff and sub-contractors.
- Assisting the project leadership in attending to Environmental Incidents and Complaints.

The Environmental Representative shall be familiar with environmental risks associated with the project, the EMP and best practice erosion and sediment control principles and practices.

#### 3.1.3 Environmental Consultant

The Environmental Consultant (SQEP) will provide technical environmental management advice as required. Key tasks include delivering the Site Environmental Induction to core staff and providing as-built confirmation of erosion and sediment controls to Council and monitoring inspections required by resource consent conditions.



#### 3.1.4 All Staff and Sub-Contractors

All staff and sub-contractors have a responsibility to undertake all activities in accordance with the requirements of this EMP. This includes reporting any activity that has the potential to or has resulted in an Environmental Incident to the Project Manager or Environmental Representative.

#### 3.2 Site Environmental Induction

All staff and subcontractors shall attend an Environmental Induction to ensure they are aware of the project's environmental risks as well as their responsibilities to help manage these risks. Prior to ground-disturbing activities, the Environmental Consultant will deliver the induction to core staff. During the project, the Environmental Representative will induct sub-contractors and new staff.

The site induction handout is attached as **Appendix 3** and all persons inducted will be recorded on the Induction Register attached as **Appendix 4**.

#### 3.3 Environmental Inspections

 Table 3 outlines the regular environmental inspections to be undertaken.

Table 3: Environmental inspections.

Environmental Inspection	Timing	Purpose
Weekly Inspection	Every seven days	<ul> <li>A comprehensive environmental inspection will:</li> <li>Confirm that all environmental controls are present, functional, and adequate.</li> <li>Identify any activities that may cause an environmental incident or actual or potential environmental effects.</li> <li>Identify maintenance requirements for implemented management measures.</li> <li>Review and record the site weather station rainfall and wind data.</li> <li>All weekly inspections shall be recorded on the Weekly Site Inspection form attached as Appendix 5.</li> </ul>



Environmental Inspection	Timing	Purpose
Pre-Event Inspection	Prior to a significant rain event <sup>1</sup>	To ensure that erosion and sediment controls are present, functional, and adequate for forecast rain event. This inspection will inform any preventative work required and may result in the Rapid Response Procedure being implemented (see <b>Section 4.6</b> ).
Rain Event Monitoring	During a significant rain event	<ul> <li>To ensure that:</li> <li>Erosion and sediment control devices continue to function correctly and inform any necessary emergency responses.</li> <li>Sediment retention devices are functioning effectively and have capacity available.</li> <li>No dirty<sup>2</sup> water is crossing the boundary of the site.</li> <li>Observations and remediation measures taken will be recorded in a daily job diary.</li> </ul>
Post-Event Inspection	Immediately following a significant rain event	Any observations and corrective actions should be recorded in a daily job diary.

#### 3.4 Environmental Inspections by SQEP

The Environmental Consultant (SQEP) can monitor the site as required by the conditions of resource consent to ensure that the EMP and ESCP are correctly implemented, identify any unforeseen issues arising and advise on alternative environmental solutions.

#### 3.5 Environmental Incident Management

Environmental incidents shall be responded to as soon as the project team becomes aware of them occurring. The response will generally involve oversight by the Environmental Consultant and will involve:

- Immediate cessation of the activity that caused the incident.
- Investigation into the cause of the incident.
- Initial response to bring the incident under control.

<sup>&</sup>lt;sup>1</sup> A significant rain event is defined as any forecast/actual rain event of 20 mm within a 24-hour period or a rain event that can generate overland flow, noting that this varies seasonally.

<sup>&</sup>lt;sup>2</sup> 'Dirty water' is defined as water that exceeds the maximum allowable water quality value outlined in the Discharge Criteria at **Section 5.2**.



• Implement any remediation works.

The Project Manager shall notify ECan and MDC of the details of any Environmental Incident within 12 hours of becoming aware of the incident. Notification will be through a phone call to Council monitoring staff (see Emergency Contacts on page four). The Project Team shall provide an Environmental Incident Report within ten working days of the incident occurring. The Incident Report form is attached as **Appendix 6**.

#### 3.6 Complaints Procedure

Any complaint received will be recorded and an investigation will be carried out. The complainant will be provided with a response acknowledging receipt of the complaint and outlining corrective actions to be implemented. After the investigation, any necessary corrective actions will be carried out and a follow-up of the original complaint is to be conducted to ensure the actions implemented have been effective. All complaints will be recorded on the Complaints Register attached as **Appendix 7**.

#### 3.7 EMP Non-Conformance and Corrective Actions

EMP non-conformances found during site inspections, monitoring or as a result of environmental incidents or complaints shall be recorded in the EMP Non-Conformance Register. The non-conformance register attached as **Appendix 8** will detail when corrective actions are due, how they are to be carried out and the close out date. The non-conformance register ensures that issues do not escalate or are missed, as well as, providing a clear record of evidence that can be used to defend any potential complaint or formal enforcement action.

#### 3.8 Records and Registers

The records listed below will be collated onsite. If a request is made by a ECan and MDC official, the records shall be made available to the official within 24 hours of the request being made.

- Environmental Induction Register Appendix 4.
- Weekly Environmental Inspection Form Appendix 5.
- Environmental Incident Reports Appendix 6.
- Complaints Register Appendix 7.
- EMP Non-Conformance Register Appendix 8.
- Water Quality Monitoring Results Appendix 9.

#### 3.9 EMP Updates

The EMP will be regularly reviewed throughout the project to ensure the document remains fit for purpose and to drive continual improvement. This may be initiated by:

- Significant changes to the construction methodology.
- Improvements identified as a result of an Environmental Incident or Corrective Action.
- Where directed by ECan and MDC Monitoring and Enforcement team.

All EMP updates will be managed through the document control table on page one and shall be submitted to ECan and MDC for acceptance.

#### 4.0 EROSION AND SEDIMENT CONTROL MEASURES

#### 4.1 Performance Criteria

Design, install and maintain erosion and sediment controls in accordance with industry best practices. Generally:

- Environment Canterbury Regional Councils Erosion and Sediment Control Toolbox.
- Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region 2016 (Auckland Council Guideline Document GD2016/005).

#### 4.2 Erosion and Sediment Control Principles

Erosion and sediment control (ESC) devices shall be installed, maintained and decommissioned in accordance with the following principles:

- Erosion and sediment controls are integrated with construction planning.
- Construction is staged to minimise the duration and area of exposed soil open at any one time.
- A 'treatment train' approach so that the sediment retention devices operate as efficiently and effectively as possible.
- Separation of 'clean' and 'dirty' water with clean water to be diverted around the site to minimise the volume of dirty water needing management onsite.
- The extent and duration of soil exposure is minimised.
- Controls are always maintained in proper working order.
- Progressively stabilise and revegetate disturbed or completed areas.
- The site is monitored, and erosion and sediment control practices are adjusted to maintain the required performance standard.
- Soil erosion is minimised as far as reasonable and practical.
- Avoidance of sediment discharge off-site and protection of receiving environments.

#### 4.3 Guidance on Erosion and Sediment Control Devices

The effective control of surface water shall be achieved through the utilisation of carefully selected erosion and sediment control devices to achieve a specific purpose. These guidelines for the devices employed on this project shall be read in conjunction with the ESCP attached as **Appendix 1** of this document.

#### 4.3.1 Site Definition

At the commencement of the project, the following components onsite will be clearly defined as detailed in Table 4.

Table 4: Site definition specifications.

Site component	Method of Demarcation
Internal 'no-go' areas (protected or sensitive areas)	Bunting or flagging tape with waratahs



#### 4.3.2 Stabilised Entranceway

No formal stabilised access is required as exiting gravelled access will be utilised during construction. The existing access extends over 1 kilometre onto the site and with no carting to be undertaken during earthworks, only modest vehicle tracking is anticipated during construction. Additional aggregate can be applied to the access is required as indicated in the schematic diagram in ESCP-002, **Appendix 1** (complete guidelines on pages 60-65 of GD05).

#### 4.3.3 "Clean Water" Diversion Bunds

Clean water diversion bunds (CWDBs) will be used to capture and divert clean water from the undisturbed surfaces above the exposed works site. The purpose of these devices is to separate clean and dirty water and minimise the size of the contributing catchment. CWDBs shall be constructed upslope of the driveway alignment to divert 'clean water' flows from the upper catchment away from the lower reaches of the driveway construction area. Contributing catchments to these devices are small (<500m<sup>2</sup>), modestly sloped and heavily vegetated with grass.

CWDBs can be formed using excess topsoil which has a low erosive risk. Standard Erosion and Sediment Control Toolbox design specifications are considered appropriate throughout the project. These devices shall be constructed in accordance with the specifications noted in the schematic diagram in ESCP-003, **Appendix 1**. Full calculations are included in **Appendix 2**.

#### 4.3.4 "Dirty Water" Diversion Channels and Bunds

Dirty water diversion channels (DWDC) will be installed to capture and carry sediment-laden stormwater from the main building platform, landscape fill areas and driveway access into the two sediment basins (described further in **Section 4.3.8**).

A dirty water diversion channel will follow the swale to be installed on the inside of the driveway access in accordance with final design. This swale shall be formed progressively during earthworks associated with this access, with check dams installed at regular intervals within the swale to reduce flow velocity down the driveway. The driveway is to be benched into the hillside and graded back into the swale.

Additionally, DWDCs are to be installed around the main building platform and landscape fill areas to convey sediment-laden run-off to Sediment Basin 1 (SB1). Drop-out pits and check dams shall be utilised within these DWDCs at regular intervals to reduce flow velocity within the channels and, subsequently, allow some heavier coarse sediment to drop out of suspension before entering SB1.DWDCs will be constructed in accordance with the schematic diagram in ESCP-003, **Appendix 1** (complete guidelines on pages 43-46 of GD05). Full calculations are included in **Appendix 2**.

#### 4.3.5 Check Dams

Rock check dams will be deployed primarily to reduce the velocity of concentrated flows in the DWDCs. They will also act to capture some coarse sediment. These are to be installed at approximately 12-metre intervals as per GD05 specifications. In DWDCs leading to SB1, rock check dams shall be placed at an alternating pattern with drop-out pits at 12-metre intervals. The check dams will be constructed in accordance with the schematic diagram in ESCP-004, **Appendix 1** (complete guidelines on pages 50-54 of GD05).

#### 4.3.6 Drop-Out Pits

Drop-out pits will be used within the DWDCs:

- To reduce flow velocity in DWDCs, allowing heavier coarse sediments to drop out and prevent them from entering retention devices.
- To act as a sump joining two intersecting DWDCs.

Drop-out pits will be used in an alternating pattern with check dams at 12-metre intervals along the DWDCs leading to SB1. They are not necessary for DWDCs leading to SB2. The drop-out pits will be constructed in accordance with the image reference in ESCP-003, **Appendix 1** (complete guidelines on page 45 of GD05).

#### 4.3.7 Temporary Culvert

Culverts shall be used onsite to transport dirty water from one side of the driveway access alignment to the other. A standardised 300 mm PVC or farm-grade culvert is recommended to allow for heavy haul vehicles to traffic over. The 300 mm culvert has been selected as a conservative approach, and is expected to provide a sufficient buffer in relation to the capacity of the engineer design swale and its associated contributing catchment. Geofabric and rock shall be placed at the outlet to prevent scour from the higher velocity water exiting the culvert. Culverts shall be constructed in accordance with the schematic diagram in ESCP-003, **Appendix 1**.

#### 4.3.8 Sediment Basin

Two sediment basins, Sediment Basin 1 (SB1) and Sediment Basin 2 (SB2), will capture and retain run-off from their respective catchment during earthworks. SB1 will be installed downslope to the north-east of the main building platform within an existing dry depression and shall primarily receive flows from the main building platform and landscape fill area. SB2 shall be installed adjacent to the driveway entrance in the south-western corner of site and will primarily receive flows from the landscape bunds, driveway alignment, and fill areas below the driveway. Locations of these basins are depicted on ESCP-001, **Appendix 1**.

A lined emergency spillway will be installed on both sediment basins, as depicted in the reference images provided on ESCP-005/006. It is noted that the northern external batters on SB1 may need to be bunded up to ensure that fall beyond the spillway is achieved. The sediment basins will need to be cleaned out periodically to ensure that retention capacity is maintained. This may require scraping of the floor to free fine silt clogged in the interstitial space of the soil beneath the basin.

A 'treatment train' approach shall be employed to increase the effectiveness of settlement within these basins. This will involve a series of check dams and drop-out pits within the DWDCs, as well as utilisation of chemical treatment as discussed in **Section 4.3.9** below. Rain-activated dosing system (RADS) unit may be prescribed for more robust chemical treatment. In addition, the emphasis on a progressive rehabilitation approach to stabilise surfaces as soon as possible will significantly reduce the sediment load on these devices. This is discussed further in **Section 4.3.13**.

The NZTA Sizing for Storage Requirements (Section 6.7 of NZTA ESC Guidelines) has been used to calculate the expected stormwater volume from the contributing catchments. The geotechnical report prepared by Geotago identifies a soakage rate of 25 mm/hr is available in a test pit adjacent to SB1. Soakage rates may be higher in the lower reaches of the site where SB2 is situated, so the actual capacity of SB2 may be larger than the calculations state. Given this, the sediment basins are



sufficiently sized for the design event and exposed area. This is demonstrated alongside full design specifications in ESCP-005/006, **Appendix 1**. The calculations for the sediment pond are included in **Appendix 2**.

#### 4.3.9 Chemical Treatment

Due to the soil characteristics and the proximity to high-value waterbodies, the adoption of chemical treatment is encouraged to promote higher rates of sediment retention. This requires the addition of a dose of a coagulant and/or flocculant to facilitate high-efficiency sediment retention, especially with finer soil particles.

A chemical treatment management plan can be prepared prior to construction to confirm appropriate dose rates in accordance with industry best practices as specified by the Erosion and Sediment Control Toolbox. This will ensure that the chemical is dosed at appropriate rates to cause efficient coagulation and/or flocculation whilst avoiding potential contaminants entering surrounding waterways. Water quality criteria and management processes are prescribed in **Section 5.0**.

#### 4.3.10 Standard Silt Fence

Standard silt fences will be used to capture potential sheet flows from the western side of the fill batters below the main building platform and driveway access. Minor soakage present on site is expected to allow impounded flows to partially soak away. The silt fence will be installed in accordance with the schematic diagram in ESCP-007, **Appendix 1** (complete guidelines on pages 112-119 of GD05).

#### 4.3.11 Silt Socks

Silt socks will be utilised as a contingency measure to intercept run-off at any observable low points along the driveway alignment and main building platform. These devices are essentially mesh or fabric tubes filled with sand. Silt socks have been chosen for this site due to the relatively low gradients. Silt socks will be installed in accordance with the reference images in ESCP-008, **Appendix 1** (complete guidelines on pages 126-130 of GD05).

#### 4.3.12 Temporary Stockpiles

Stockpiles may be formed as part of earthworks. A nominated stockpile area has been provided on the ESCP, though it is recognised that the location of stockpiles will likely change with the progress of the earthworks. Long-standing stockpiles shall be stabilised with a temporary polymer to prevent erosion. Stockpiles shall be constructed in accordance with the schematic diagram in ESCP-008, **Appendix 1**.

#### 4.3.13 Progressive Rehabilitation

Progressive stabilisation of earthworks is to occur promptly as areas are finished to minimise the area of exposed soil and thus the generation of sediment-laden water. This will be a key mitigation measure to reduce pressure on sediment retention devices. Cut and fill batters should be topsoiled and re-seeded, with hay mulch and k-line irrigation recommended to promote rapid stabilisation of these surfaces. Any notably steep batters shall be stabilised in accordance with engineer recommendations. A biodegradable coconut fibre matting is recommended on steeper batters to provide protection from surface erosion whilst promoting revegetation. Reference images are provided on ESCP-009, **Appendix 1**.



AP65 aggregate should be progressively applied to the driveway alignment to reduce the erosive potential of the surface, and subsequent pressure on retention devices. Additionally, it is recommended that the main building platform is progressively capped with clean aggregate.

#### 4.4 As-Built Verification

The Environmental Consultant will provide the Council with as-built confirmation to verify that the erosion and sediment controls have been installed in accordance with the approved ESCP.

#### 4.5 Maintenance of Erosion and Sediment Control Devices

Ongoing maintenance of the site shall be undertaken as follows:

- Clean out sediment of erosion and sediment control as soon as 20% capacity has been reached.
- Any mucked-out sediment shall be stockpiled, dried and reused as planting media for revegetation.

#### 4.6 Rapid Response Procedure for Significant Rain Events

The Environmental Representative will stay vigilant of weather forecasts. If a significant rain event (defined as any forecast/actual rain event of 20 mm within a 24-hour period or a rain event that can generate overland flow) is imminent, all works will cease in sufficient time for staff to inspect and maintain erosion and sediment control devices and undertake any stabilisation required. Observations will continue through the rain event to ensure the functioning of erosion and sediment control devices.

#### 4.7 Decommissioning and Removal

Erosion and sediment control devices will remain in place until 'stabilisation' of the site has been achieved. This is generally defined as 80% vegetative cover as depicted in **Figure 2**.

It is noted that the removal of controls may result in minor soil exposure. Any soils exposed during decommissioning will be stabilised with either grass, mulch or other appropriate erosion control.



Figure 2: Visual cover estimation (Source: Catchments and Creeks Pty Ltd)

#### 4.8 Inspections and Monitoring

Details of inspections and monitoring are stated in Section 3.3.

#### 4.9 Contingency Measures

The following contingency measures in Table 5 shall be deployed as required.

Table 5: Erosion and sedimen	t control c	ontingency	measures.
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lssue	Contingency Measure
Sediment-laden stormwater flowing across the site boundary	Undertake measures to stop the flow immediately. Ensure controls are installed according to the ESCP. Contact the Environmental Consultant (SQEP) who will initiate the incident response.
Controls do not appear to be working as intended	Contact Environmental Consultant (SQEP) to inspect, advise and revise ESCP as required.
The site is inappropriately exposed prior to imminent rain event	Cease works and shift effort to checking erosion and sediment controls and stabilisation via the Rapid Response Procedure outlined in Section 4.6.
Sediment retention devices are near capacity and more rain is forecast	Contact the Environmental Consultant (SQEP) immediately for advice.



Issue	Contingency Measure
Abatement notice issued by Council	Contact the Environmental Consultant (SQEP) immediately to advise on methods to meeting abatement notice requirements within the time stated by the abatement notice.

#### 4.10 Erosion and Sediment Control Incident

An erosion or sediment control incident is considered to have occurred where performance criteria outlined in **Section 4.1** is not met. The incident procedures outlined in **Section 3.5** shall commence.

#### 5.0 WATER QUALITY MANAGEMENT

Surface water bodies (rivers, streams, lakes and wetlands) provide important habitats for many species of plants, fish, birds and animals, some of which are endemic and/or threatened. 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.

#### 5.1 Receiving Waterbodies

Lake Tekapo is located approximately 280 m east of the proposed building platform at its nearest point. Lake Tekapo is described as a large, glacial-fed lake with steep shorelines and mudflats. While rainbow and brown trout are common, native fish are found in low numbers. Drawdown by Tekapo Power Station (approximately 1.4 km downstream of the lake) in winter exposes shoreline bays and deltas which are particularly important for waterfowl breeding.

The Cass River is approximately 600 m south of the site at its nearest point. This alpine river is identified as a site of natural significance under MDC and comprises open braided gravel riverbeds with floodplains, swamplands and semi-stable deltas. It provides a popular breeding and feeding ground for many wading birds, including the black stilt, wrybill, and caspian tern.

Micks Lagoon is a montane lake and carex swamp and is located approximately 500 m to the north-west of the site. This lagoon is also identified as a site of natural significance under MDC, with birds such as black stilt, marsh crake and grey teal present. An unnamed stream drains the Micks Lagoon to the south and flows into the Cass River approximately 980 m downstream. Farm drains from the surrounding land also enter the unnamed stream.

An unidentified wetland is situated approximately 250 m to the north-east of the site. This wetland is situated at the base of the raised knoll and appears to receive overland sheet flows from the surrounding moraine landscape. Matagouri vegetation also appears present within the wetland profile.

Four surface waterbodies are identified within proximity to the site. However, potential adverse effects on these waterbodies are expected to be effectively mitigated through the adoption of best practice erosion and sediment controls, and environmental management measures that avoid the generation and discharge of contaminants associated with earthworks and general construction activities.



Figure 3: Waterways within and in proximity to the site (site in yellow).

#### 5.1.1 Legislative Considerations

Land and Water Regional Plan		
Rule requirement	Comment	
5.94A - The discharge of construction-phase stormwater, other than into or from a reticulated stormwater system to surface waterbody, or onto or into land in circumstances where a contaminant may enter groundwater or surface water is a permitted activity, provided the following conditions are met:		
The area of disturbed land from which the discharge is generated is less than:	The subject site is not located within a 'High Soil Erosion Risk Zone'.	
a) 1000 m <sup>2</sup> for any construction-phase stormwater generated as a result of work carried out in an area shown as High Soil Erosion Risk on the Planning Maps; or		
b) two hectares in any other location; and		



The concentration of total suspended solids in the discharge shall not exceed:	Discharge limits are set out in section 5.2 below to ensure this provision of rule 5.94A is achieved.
b) 50g/m <sup>3</sup> where the discharge is to any spring-fed river, Banks Peninsula River, or to a lake except when the background total suspended solids in the waterbody is greater than 50g/m <sup>3</sup> in which case the Schedule 5 visual clarity standards shall apply; or	
c) 100g/m <sup>3</sup> where the discharge is to any other river or to an artificial watercourse except when the background total suspended solids in the waterbody is greater than 100g/m <sup>3</sup> in which case Schedule 5 visual clarity standards shall apply; and	
The discharge does not result in an increase in the flow in the receiving waterbody at the point of discharge of more than 1% of a flood event with an Annual Exceedance Probability of 20% (one in five-year event); and	Stormwater runoff will be contained on site and released (if required) overland in a controlled manner. There is no direct point source discharge into adjoining waterbodies.
The discharge is not form, into or onto contaminated or potentially contaminated land; and	There are no identified contaminants within the proposed earthworks footprint.
The discharge does not contain any hazardous substance; and	No hazardous substances will be discharged from the site.
The discharge does not occur within a Community Drinking-water Protection Zone as set out in Schedule 1.	No discharge within proximity of a community drinking water protection zone will occur.
National Environmental Standards for Freshwater (NES-FM) 2020	
Rule requirement	Comment
52) Earthworks outside, but within a 100 m setback from, a natural	l inland wetland is a non-complying activity if it:
(a) results, or is likely to result, in the complete or partial drainage of all or part of a natural inland wetland; and	The definition of the unidentified wetland under the National Policy Statement for Freshwater and NES-F
(b) does not have another status under any of regulations 38 to 51.	has not been determined. Irrespective of its definition however, no works are proposed within a 100 m sethack of the wetland (over 200 m at its closest
(2) The taking, use, damming, or diversion of water outside, but within a 100 m setback from, a natural inland wetland is a non-complying activity if it—	point).
(a) results, or is likely to result, in the complete or partial drainage of all or part of a natural inland wetland; and	
(b) does not have another status under any of regulations 38 to	



#### 5.2 Performance Criteria

Any waters flowing across the site boundaries will meet the criteria in **Table 5** to ensure that the Freshwater outcomes for Canterbury Lakes are adhered to. In this instance, that Lake Tekapo is maintained in a natural state.

#### Table 5: Water quality discharge criteria.

Parameter	Discharge Criteria		
Turbidity	≤ 175 NTU <sup>3</sup>		
Or			
Comparative Visual Clarity (mm) <sup>4</sup>	≥ 100 mm		
If turbidity or visual clarity is exceeded, test for			
Total Suspended Sediment (TSS)	$\leq 50 \text{ g/m}^3$		
рН <sup>5</sup>	5.5 – 8.5		
Hydrocarbons or tannins	No visible trace		
Waste	No waste or litter is visible		

#### 5.3 Management Measures

The following measures will be deployed to ensure the protection of water quality:

- Erosion and sediment controls will be implemented and maintained in accordance with the Erosion and Sediment Control Measures in **Section 4.0**.
- Refuelling, servicing and storage of hydrocarbons will be in accordance with the relevant procedures in the Chemicals and Fuels Management in Section 10.
- All concrete washing is to be undertaken in the designated concrete wash-out pit as per Appendix 1.
- All plant and equipment onsite will be inspected regularly to ensure they are of an acceptable standard.

<sup>&</sup>lt;sup>3</sup> Turbidity can be instantly measured using a nephelometer. This is considered desirable as opposed to testing TSS which requires laboratory testing and can take several days. Turbidity can be inferred from the relationship with TSS via linear regression. If the specified turbidity value is not met, a water sample will be collected and sent for TSS laboratory testing.

<sup>&</sup>lt;sup>4</sup> In the absence of a turbidity measure, visual clarity can be inferred from the relationship with turbidity via linear regression. If the specified visual clarity value is not met, a water sample will be collected and sent for TSS laboratory testing.

<sup>&</sup>lt;sup>5</sup> pH to be tested only when chemical treatment is undertaken.



- Stockpiling of any organic, erodible or hazardous material onsite is not to be placed within close proximity of a watercourse/major drainage line, unless appropriate controls are in place.
- All chemical treatment of sediment-laden water will be undertaken in accordance with an approved Chemical Treatment Management Plan.

#### 5.4 Monitoring

Water quality will be monitored in accordance with Table 6.

 Table 6: Water quality monitoring measures.

Sampling Scope	
Objective	To confirm that all controlled and uncontrolled water flowing from the site meets the Discharge Criteria referred to in <b>Section 5.2.</b>
Responsibility	On site water quality sampling is to be completed by the nominated Environmental Representative. <b>Note:</b> SQEP is available to provide training and guidance regarding on site sampling.
Spatial boundaries	All water that enters and exits the site from rainfall or overland flow.
Frequency	Immediately following a 20 mm is forecast in a 12-hour period or when water is flowing across the boundary of the site. Where a Significant Rain Event occurs through the night, monitoring shall be undertaken the following morning.
Sampling Design	
Water Quality Criteria	As outlined in the Discharge Criteria referred to in Section 5.2.
Sampling Locations	<ul> <li>At boundaries of the site where any water is flowing, specifically the following point discharges:</li> <li>Sediment Basin 1 spillway - 43°52′26″ S: 170°29′48″ E</li> <li>Sediment Basin 2 spillway - 42°52′24″ S: 170°29′48″ E</li> </ul>
	• Sediment Basin 2 Spiliway – 43 52 14 S: 170°30 02° E

Sampling Method	<ul> <li>TSS – Registered laboratory</li> <li>Turbidity (NTU) – Nephelometer</li> <li>pH – pH meter – only if utilising chemical treatment</li> <li>Gross pollutants – visual observations</li> <li>Tannins – visual observations (any unusual darkening of waters?)</li> <li>Hydrocarbons – visual observations (is there any oily film<sup>6</sup> on surface or smell?)</li> </ul>		
Quality Control	Any water quality meter will be calibrated according to manufacturer instructions. All observations will be recorded and analysed.		
Recording			
Recording Results	All results will be entered into a spreadsheet and kept onsite (form attached as Appendix 9).		
Actions			
Non-conformances	Any exceedances observed will be reported to the Project Manager/ Environmental Consultant who will investigate and ensure appropriate corrective actions are implemented immediately.		

#### 5.5 Contingency Measures

The following contingency measures in **Table 7** shall be adopted if required.

 Table 7: Water quality contingency measures.

Issue	Contingency Measure
Exceedance of water quality criteria	<ul> <li>Contact the Project Manager and Environmental Consultant (SQEP) immediately.</li> <li>Works will cease or be modified to remove further risk of contamination.</li> <li>ECan and MDC will be verbally notified.</li> <li>The Environmental Incident procedure will commence.</li> <li>Remedial measures will be implemented and the Environmental Incident will be closed out by the Environmental Consultant (SQEP), with a copy of an Environmental Incident report to the Project Manager, ECan and MDC.</li> </ul>

<sup>&</sup>lt;sup>6</sup> Some bacteria produce a naturally occurring film on the water surface. Bacteria films breaks apart in angular shapes when disturbed whereas hydrocarbon film separates as globules.



#### 5.6 Water Quality Incidents

A water quality incident is considered to have occurred where the water quality performance criteria outlined in **Section 5.2** is breached. The incident procedures outlined at **Section 3.5** shall commence.

#### 6.0 DUST MANAGEMENT

Dust from construction activities, vehicle movements and stockpiles can contribute to sediment runoff and create a nuisance to the public, neighbouring properties, adjoining roads and service infrastructure. The key risks associated with dust occur during the bulk earthworks phase of the project.

There are a range of activities that may produce dust onsite including:

- General disturbance of soil (particularly during drier months).
- Inappropriate staging that does not seek to minimise the extent of exposed soil.
- Vehicle movements along haul roads.
- Stockpiling of topsoil or subsoil.
- Slow or ineffective revegetation procedures.

#### 6.1 Sensitive Receptors

The site is located on a slightly elevated knoll overlooking Lake Tekapo to the north and east. Key sensitive receptors to protect from the effects of dust include contractors on site and surrounding waterbodies. There are no immediate neighbouring properties that would potentially be affected by dust.

Due to the surrounding topography and alpine environment, wind direction and speed can be changeable. Contractors shall remain vigilant for variations in wind conditions. The project shall ensure the site is prepared appropriately to manage potential dust effects.

#### 6.2 Performance Criteria

The project must ensure that reasonable and practical measures are taken to avoid dust moving across the boundaries of the site at all times.

#### 6.3 Management Measures

The following measures will be deployed to ensure dust generation onsite is minimised:

- Stage works where possible to minimise soil exposure extents and timeframes.
- Revegetate disturbed areas progressively throughout construction.
- Dust suppression of exposed areas and stockpiles by water trucks or other methods (e.g., k-lines) approved by the Environmental Representative.<sup>7</sup>
- If dust activities cannot be controlled during high winds, works will cease until favourable conditions return.
- Only designated access points and haul routes are to be used.
- Site access to be constructed in accordance with GD05 (detail at Section 4.3.2).

<sup>&</sup>lt;sup>7</sup> Ensure a consented water take permit is approved by the local authority. If taking water from lakes and or rivers, ensure that the permitted volume of water is taken.



- All site access and surrounding roads to be swept clean regularly.
- Stockpile heights are to be minimised where possible (< three metres) unless they are covered (e.g. an erosion blanket, chemical sealant, temporary cover crop or mulched).
- Long-standing stockpiles (greater than six weeks) shall be appropriately stabilised.
- Within two weeks of completion, all earth worked areas will be sown out with grass, landscaped or otherwise stabilised by an appropriate erosion control.

#### 6.4 Monitoring

Site staff will maintain continual vigilance for any increases in wind to ensure measures are deployed prior to dust crossing site boundaries. Weekly Environmental Inspections will also ensure that the management measures described above are sufficient and performing effectively.

#### 6.5 Contingency Measures

The contingency measures in **Table 8** shall be adopted if required.

 Table 8: Dust contingency measures

Issue	Contingency Measure
Excessive dust creation from soil disturbance	<ul> <li>Increase frequency of water truck spraying or increase irrigation.</li> <li>Spray down excavation areas and activities where excavator bucket is operating.</li> <li>Cease excavation during high winds, particularly if wind direction is likely to impact sensitive receivers.</li> </ul>
Excessive dust creation from hauling operations	<ul> <li>Reduce truck speeds.</li> <li>Apply skim of aggregate over the haul road surface.</li> <li>Install shakedown devices at entry and exit points.</li> </ul>
Excessive dust creation from stockpiles	<ul> <li>Spray stockpiles with water or apply a temporary polymer.</li> <li>Hydro-mulch, seed or stabilise stockpiles, cover stockpiles with geofabric.</li> <li>Locate stockpiles further away from sensitive receptors.</li> </ul>
Abatement notice issued by Council	Contact the Environmental Consultant (SQEP) immediately to advise on methods to meeting abatement notice requirements within the time stated by the abatement notice.

#### 6.6 Dust Incident

A dust incident is considered to have occurred where:

- Dust is observed crossing the boundary into sensitive receptors or,
- A justified complaint is received regarding dust emissions across the boundary of the site.

The incident procedures outlined at **Section 3.5** shall commence.

#### 7.0 NOISE AND VIBRATION MANAGEMENT

Many construction and demolition activities can incur noise and vibration effects. However, noise generated during construction, maintenance, and demolition work is generally of a temporary nature. Provided ongoing noise does not occur at inconvenient times, the adverse effects can generally be avoided or mitigated.

NZS 6803:1999 Acoustics - Construction Noise, recommends higher noise criteria for construction activities during daytime hours (Monday to Saturday) for residential areas and rural dwellings, while for Sundays and public holidays lower noise criteria are set to provide days of rest from construction noise.

The following assessment and management measures are intended for standard construction equipment that is not expected to induce noise or vibration beyond the maximum limits in the MDC District Plan.

Potential noise and/or vibration effects may be generated by the following:

- Excavation and earth moving plant
- Light vehicles near sensitive receptors
- Ancillary plant and equipment
- Compaction equipment
- Reversing alarms

#### 7.1 Sensitive Receptors

Due to the rural nature of the subject site, noise and vibration effects associated with the earthworks and construction of the dwelling are not anticipated to adversely impact on surrounding receptors.

#### 7.2 Performance Criteria

- Construction activities shall meet relevant noise limits specified under Chapter 14 Temporary Activities and Buildings and Environmental Noise, of the Mackenzie District Council District Plan. This requires Construction noise in any zone shall not exceed the recommended limit in, and shall be measured and assessed in accordance with, the provisions of NZS 6803P:1984 The Measurement and Assessment of Noise from Construction, Maintenance, and Demolition Work (or its successors).
- Construction sound at any point within the site must comply with the limits specified in Tables 2 and 3 of NZS 6803:1999 Acoustics Construction Noise, when measured and assessed in accordance with that standard (see Table 9 below).
- 3. Construction activities shall meet relevant vibration limits specified under Rule 2.3.2 of Chapter 14 Temporary Activities and Buildings and Environmental Noise, of the Mackenzie District Council District Plan.
- 4. Vibration from any activity must not exceed the guideline values given in *DIN 4150-3:1999 Effects of vibration on structures* on any structures or buildings on any other site (see **Table 10** below).
- 5. Construction activities shall be undertaken in accordance with the permitted hours of operation outlined at Section 2.2 above.



Time of Week	Time Period	$L_{Aeq(t)}$	L <sub>Afmax</sub>
Weekdays	0630 – 0730	55 dB	75 dB
	0730 – 1800	70 dB	85 dB
	1800 - 2000	65 dB	80 dB
Saturdays	0630 – 0730	45 dB	75 dB
	0730 – 1800	70 dB	85 dB

Table 9: Upper limits in dB(A) for construction work noise in residential areas for more than 20 weeks.

#### Table 10: Vibration Thresholds for Structural Damage (PPV mm/s).

	Short Term			Long-Term	
	At Foundation		Uppermost Floor	Uppermost Floor	
Types of Structures	0 to 10 HZ	10 to 50 Hz	50 to 100 HZ	All Frequencies	All Frequencies
Commercial/Industrial	20	20 to 40	40 to 50	40	10
Residential	5	5 to 15	15 to 20	15	5
Sensitive/Historic	3	3 to 8	8 to 10	8	2.5

Note: When a range of velocities is given, the limit increases linearly over the frequency range.

#### 7.3 Management Measures

The following measures will be deployed to ensure noise and/or vibration associated with the project are appropriately mitigated:

- Where practicable, select lower noise producing equipment or use lower noise generating alternatives.
- Regularly service equipment to ensure plant is running optimally.
- Plant and equipment to be fitted with noise control/attenuation devices as appropriate and maintained and operated in accordance with manufacturer's specifications.
- Revving of engines will be limited. All plant and vehicles will be turned off when not in use and if safe to do so.
- The use of audible alarms on mobile equipment will be limited, and two-way communication will be used.
- Undertake activities that may lead to noise or vibration effects, during reasonable and practical hours.



#### 7.4 Monitoring

All earthworks activity will be closely monitored by the operator to ensure that noise and vibration remains within the required limits. If monitoring finds the activity cannot comply with performance criteria, an Acoustic Specialist may need to be engaged to assess the project and provide appropriate mitigation measures and monitoring. Weekly Environmental Inspections shall include an assessment of the site to determine the effectiveness of noise and vibration management controls.

#### 7.5 Contingency Measures

The following contingency measures in Table 11 shall be adopted if required.

Table 11: Noise and vibration contingency measures.

Issue	Contingency Measure
Noise and/or vibration complaint received	Manage the complaint in accordance with the Environmental Complaints procedure in Section 3.6.
Exceedance of performance requirement criteria	The Environmental Consultant (SQEP), in consultation with the Environmental Representative, will investigate and implement actions to reduce noise and/or vibration levels to below criteria levels.
Ongoing noise and/or vibration issues	Where noise or vibration emissions consistently exceed the performance criteria despite the site staff's best efforts, an Acoustic Specialist will be engaged to assist.
Abatement notice issued by Council	Contact the Environmental Consultant (SQEP) immediately to advise on methods to meeting abatement notice requirements within the time stated by the abatement notice.

#### 7.6 Noise and Vibration Incident

A noise or vibration incident is considered to have occurred when a justified complaint is received and on investigation is found to exceed the performance criteria. The environmental incident procedures outlined in **Section 3.5** shall commence.

#### 8.0 CULTURAL HERITAGE MANAGEMENT

The loss or damage of cultural heritage items could be caused by construction activities. The damage or loss of artefacts can lead to the loss of culturally or historically significant items and information. Examples of cultural heritage items include:

- Koiwi tangata (human skeletal remains).
- Waahi taoka (resources of importance).
- Waahi tapu (places or features of special significance).
- Māori artefact material.
- A feature or archaeological material predating 1900.
- Unidentified archaeological or heritage site.

#### 8.1 Location of Known Cultural Heritage Significance

A search of ECan and MDC's geospatial databases indicates there are no known items of cultural or heritage significance on the site. The possibility of encountering items of cultural or historical significance cannot be ruled out and the management measures prescribed below should be followed at all times during earthworks.

#### 8.2 Performance Criteria

- The protection of cultural heritage artefacts and places in accordance with the *Heritage New Zealand Pouhere Taonga Act, 2014*.
- Strict adherence to Heritage New Zealand's *Archaeological Discovery Protocol* (attached as **Appendix 10**) in the case of unexpected finds.

#### 8.3 Management Measures

All works on this project will be undertaken in accordance with the obligations of the *Heritage New Zealand Pouhere Taonga Act*, 2014.

#### 8.4 Monitoring

Weekly inspections shall include a visual assessment of the site to ensure that no new significant artefacts have been encountered. However, operators must remain vigilant for such encounters as they occur.

#### 8.5 Accidental Finds

If any unknown artefacts are uncovered, the project will work to Heritage New Zealand's *Archaeological Discovery Protocol* (attached as **Appendix 10**).

#### 9.0 VEGETATION MANAGEMENT

#### 9.1 Sensitive Receptors

The subject site is predominantly covered in exotic pasture species associated with the agricultural activities of Godley Peaks Station. The proposed building platform is situated within the middle of a well-developed paddock, currently used to grow barley. Developed paddocks are prominent towards the west, south and north of the subject site. Towards the east, alpine tussock, grey shrubland and mixed grass species are common as the adjoining paddock falls towards the eastern shores of Lake Tekapo. Native matagouri has been identified around the edges of the natural basin to the immediate east of the proposed building platform. These are not expected to be disturbed.

There are no identified sensitive receptors within the proposed earthworks footprint of the subject site. Works associated with this project are not anticipated to interfere with areas of identified ecological value (refer surface waterbodies identified in **Section 5.1**). Therefore, potential adverse effects associated with the earthworks are considered to be less than minor.



**Photo 1:** The paddock, within which the subject site is situated, is currently being utilised for growing barley.



**Photo 2:** Alpine tussock, grey shrubland and mixed grass species characterise surrounding area.



**Photo 3:** Scattered matagouri around the edges of the shallow natural basin to the east of the building platform.



**Photo 4:** Matagouri appears present in the unidentified wetland area approximately 250 m north-east of the site.



#### 9.2 Performance Criteria

- Avoid the clearance of indigenous or protected vegetation where possible during excavation works.
- Avoid disturbance/harm to any native fauna species.

#### 9.3 Management Measures

The following measures will be deployed to manage vegetation:

- Demarcate protected vegetation areas as no go zones.
- Treating weeds prior to disturbance of the natural surface.
- Maintain existing indigenous and or any protected vegetation.
- Weed free topsoil will be retained for reuse in site rehabilitation.
- Mulch will be immediately spread over the site. If mulch does need to be stockpiled this will be restricted to 2.5 m high to reduce leachate release and risk of fire.

#### 9.4 Monitoring

Weekly Environmental Inspections shall include a visual assessment of the site to determine the effectiveness of vegetation management controls.

#### 9.5 Vegetation Incident

A vegetation incident is considered to have occurred where:

- Protected vegetation is damaged or removed.
- A no-go zone is breached.

The environmental incident procedures outlined at **Section 3.5** shall commence.
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#### **10.0 CHEMICALS AND FUELS MANAGEMENT**

Hazardous substances can endanger both human health and the environment. Used incorrectly they can cause catastrophic accidents, such as fires and explosions, and serious harm to people who are exposed to them.

#### 10.1 Sensitive Receptors

Key sensitive environmental receptors include staff members working on the site and surrounding surface waterbodies.

#### 10.2 Performance Criteria

- Chemicals and fuels are stored and used in a manner that avoids contamination of site and surrounding environment.
- All spills are cleaned up immediately and the contaminated soils/waters disposed of appropriately.

#### 10.3 Management Measures

The following measures will be deployed to ensure chemicals and fuels associated with the project are appropriately managed.

- All hazardous substances to be stored, transported and used according to the safety data sheet requirements.
- Storage of chemicals and fuels shall be located as far as practicably possible from waterways and concentrated flows.
- Refuelling of vehicles and plant onsite will occur in the designated refuelling bay as shown in ESCP-010, Appendix 1.
- All concrete washing is to be undertaken in the designated concrete wash-out pit as per the design specifications in ESCP-010, Appendix 1.
- One 240 L Oil and Hydrocarbon spill kit and one 240 L Chemical spill kit will be located in close proximity to the location of liquid hazardous materials storage and refuelling areas.
- The volumes of the hazardous substances listed in Table 12 will not be exceeded.

#### Table 12: Maximum volumes of chemicals and fuels

Chemicals and Fuels	Maximum Volume	Storage Location	
Diesel	1,500 L	Portable trailer.	
Unleaded Fuel	100 L	Jerry cans in lockable container	
Oil	100 L	Packaging in lockable container	
Lubricant (WD40 or similar)	Six Cans	Packaging in lockable container	
Grease	5 L	Packaging in lockable container	
Spot marking paint	2 L	Packaging in lockable container	

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#### 10.4 Monitoring

Weekly Environmental Inspections shall include a visual assessment of the site to determine the effectiveness of chemicals and fuels management.

#### 10.5 Contingency Measures

The following contingency measures in Table 13 shall be adopted if required.

Table 13:	Chemicals and	fuels contingency	/ measures
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Issue	Contingency Measure
Spills response	<ul> <li>Stop works in proximity to the spill and assess the safety of all personnel.</li> <li>Take immediate action to contain the spill to prevent discharge into stormwater drains or natural waterways.</li> <li>Use spill kits to contain and treat the spill.</li> <li>Notify Environmental Consultant to advise on next steps.</li> <li>If necessary, notify the Regional Council spill response unit.</li> <li>Remove contaminated material to a suitable contained location for remediation/disposal (require any necessary approvals/permits from ECan).</li> <li>The spill kits shall be replaced by an approved supplier.</li> </ul>
Inappropriate storage	<ul> <li>Upgrade facility.</li> <li>Clean-up of storage area.</li> <li>Notify and train staff.</li> </ul>
Inappropriate handling/transport	<ul> <li>Notify and train staff through toolbox meetings on the appropriate handling and transport methods.</li> </ul>
Inadequate spill kit materials	<ul> <li>Order more materials.</li> <li>Investigate types of chemicals onsite and consult a supplier for advice on appropriate equipment.</li> <li>Develop or revise spill material monitoring and ordering system.</li> </ul>
Inappropriate disposal of chemicals or fuels	<ul><li>Provide appropriate disposal facilities or service providers.</li><li>Notify and train staff.</li></ul>
Inaccurate or insufficient records	<ul><li>Advise staff and update records.</li><li>Monitor through inspections.</li></ul>

#### 10.6 Chemicals and Fuels Incident

A chemicals and fuels incident is considered to have occurred where:



- A spill more than five litres has occurred.
- A situation is discovered where a spill of more than five litres would likely have occurred before it happens where the management measures listed above have not been followed.

The environmental incident procedures outlined at Section 3.5 shall commence.

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#### **11.0 CONTAMINATED SITE MANAGEMENT**

A search of Council records has not provided any indication of the site being used in the past for a HAIL activity.

#### 11.1 Sensitive Receptors

There are no identified sensitive receptors within the proposed earthworks footprint of the subject site at this time.

#### 11.2 Performance Criteria

• Effectively identify and manage any sites where contaminants are found and ensure they do not contaminate beyond the location they are found (including offsite) or present a risk to human health.

#### 11.3 Management Measures

The following measures will be deployed to ensure contaminated soil associated with the project is appropriately mitigated:

- Will any evidence of contamination be noticed in the field, the personnel noting the contamination shall immediately notify the Environmental Representative.
- Many of the controls required to manage potential for effects associated with low level contaminated soil is based on best practice erosion and sediment control and dust management techniques. These are outlined in **Section 4.3** (erosion and sediment controls) and **Section 6.4** (dust controls). Both sections cover management of stockpiles.

#### 11.4 Monitoring

Unless any higher-level contamination is accidentally found during earthworks, no specific monitoring of soil, groundwater or water quality will occur (other than what is detailed in the water quality criteria outlined at **Section 5.0**). If material is found it is expected that monitoring may be required but this shall be at the direction of the soil contamination expert.

#### 11.5 Contingency Measures

If a potential contaminated site is identified (e.g., by landfilled waste, odour) during construction works, the following contingency measures will be undertaken:

- Immediately notify the Project Manager.
- Prevent spread of contamination by installation of silt fencing, covering material with plastic or geofabric material.
- Engage the Environmental Consultant who will advise on the engagement of a Contaminated Soil expert.
- EMP to be amended to manage any new contaminated soil encountered in coordination with the contaminated soil expert (if engaged).

#### 11.6 Contamination Incident

An environmental incident is considered to have occurred where inspection finds that excavation or other work continues within contaminated soil without report or remedial action. The environmental incident procedures outlined in **Section 3.5** shall be followed.



## APPENDIX 1 Erosion and Sediment Control Plan Drawing



#### Legend



#### Notes

1. This plan is to be read in conjunction with the Environmental Management Plan document prepared by Enviroscope.

All locations of erosion and sediment control (ESC) devices are indicative and exact placement to be confirmed onsite.

3. ESC devices to be installed and maintained in accordance with Environment Canterbury Regional Councils Erosion and Sediment Control Toolbox and manufacturer's instructions where relevant.

4. All devices are to be inspected daily and pre and post-rain event to ensure they are fully functional.

Landscape batters to be stabilised with topsoil and re-seeded immediately following formation.



Specification
50-150 mm washed aggregate
150 mm
10 m
4 m



- This has been designed to convey up to a 5% AEP design event. •
- Check dams required. ٠
- Trapezoidal shape ٠
- Full calculations are included in Appendix 2. •



- Monitor the inlet and outlet for scour. •
- Ensure there are no areas of ponding or blockages along the length of the bund. ٠

**DROP-OUT PIT** 

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- Drop out pits should be one metre deep by one-metre-wide cube.
- As a contingency measure, drop out pits can be increased in size and lined to prevent any scour of the pit.





- The culvert should consist of a 300 mm PVC or farm-grade culvert to allow for heavy haul vehicles to traffic over.
- Geofabric and rock should be placed at the outlet to prevent scour from the higher velocity water exiting the culvert.

### **Project:** Godley Peaks Station Homestead

Description: Erosion and Sediment Control Plan - Schematics

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Drawn	Approved	Date	Drawing Number	Revisio
WT	TG	29/07/2024	ESCP - 003	В

## **TEMPORARY CULVERT**

(Diagram from TP90 – now GD05)

#### on

#### CHECK DAMS (Page 50-54 from GD05)







Slope of site (%)	Spacing (m) of dams with a 450 mm centre	Spacing (m) of dams with a 600 mm centre
	height	height
Less than 2%	24	30
<mark>2-</mark> 4%	12	15
4- 7%	8	11
7- 10%	5	6
Greater than 10%	Unsuitable – use stabilised channel or specific	Unsuitable – use stabilised channel or specific
	engineered design	engineered design

• Check dams will be constructed out of 100 – 300 mm mix rock or sandbags. As the DWDC has a depth of 200 mm, check dams should be 450 mm high with the centre being 50-100 mm lower than •

the outside edges to form a spillway.

• Check dams should be placed every 12 metres as per the table above.

## Project: Godley Peaks Station Homestead

**Description:** Erosion and Sediment Control Plan - Schematics

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Drawn	Approved	Date	Drawing Number	Revisio
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#### on

## SEDIMENT BASIN 1

#### Type D Sediment Basin from IECA, Image from Enviroscope



- The basin is to be formed within the exiting hollow and bunding up low points with compacted, lined, material.
- Sediment to be cleaned out once 20% capacity reached.
- Sizing and calculations in Appendix 2.

Project: Godley Peaks Station Homestead

Description: Erosion and Sediment Control Plan - Schematics

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 Revision

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 29/07/2024
 ESCP-005
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## SEDIMENT BASIN 2

#### Type D Sediment Basin from IECA, Image from Enviroscope



- Chemical treatment via batch dosing or dripper system can be undertaken in accordance with an approved CTMP.
- The basin is to be formed within the exiting hollow and bunding up low points with compacted, lined, material.
- Sediment to be cleaned out once 20% capacity reached.
- Sizing and calculations in Appendix 2.

Project: Godley Peaks Station Homestead

**Description:** Erosion and Sediment Control Plan - Schematics

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urns (m)	Silt fence length (m)					
	(maximum)					
	Unlimited					
	300					
	230					
	150					
	75					
	40					



- Temporary stockpiles should be a maximum height of two metres to mitigate wind effects and to preserve the quality of the topsoil as future planting media for revegetation.
- If the stockpile is to be left insitu for a period of 4 weeks or more it shall be seeded with grass or erosion control matting to provide erosion and dust protection.
- A silt fence should be installed on the downslope of the stockpile.





SILT SOCK

Page 126-130 from GD05

- As a contingency measure, silt socks shall be placed at observable low points to capture dirty water run-off.
- It is important that the silt socks are secured flush with the ground to prevent sediment from undercutting the sock.
- Ensure silt socks are placed along the contour of a site.

**Project:** Godley Peaks Station Homestead

**Description:** Erosion and Sediment Control Plan - Schematics

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Drawn Approved Date **Drawing Number** Revision 29/07/2024 WΤ ΤG ESCP - 008 В



### **EROSION CONTROL REHABILITATION**

Images - Enviroscope





Coconut fibre matting to be applied to steep batters to prevent surface erosion and promote revegetation.
Topsoil, seed and hay mulch to be applied to lower gradient batters

#### Project: Godley Peaks Station Homestead

Description: Erosion and Sediment Control Plan - Schematics

# enviroscope

Drawn	Approved	Date	Drawing Number	Revisio
WT	TG	29/07/2024	ESCP - 009	В

#### CONCRETE WASHOUT PIT

#### **REFUELING BAY**





- Locate the hardstand as far as practicably possible from waterways and concentrated flows.
- Ensure spill kit is located nearby.



SPILL KITS

• One 240 L Oil and Hydrocarbon spill kit and one 240 L Chemical spill kit will be located in close proximity to the • location of liquid hazardous materials storage and refuelling areas.



- The concrete wash out pit consists of a plastic-lined bunded pit constructed with fill or straw bales.
- After concrete washout any water shall be left to evaporate. •
- Cured concrete is to be disposed of within the plastic sheet to a licensed facility. •

<u>WASTE</u>



- Where possible, waste shall be segregated into labelled bins. •
- Wastes on site will be suitably contained and prevented from escaping off site. This may include covering skip bins during high winds.
- Waste storage is not permitted in or near drainage paths. •
- Wastes will be removed from site when bin is full. •

#### **Project:** Godley Peaks Station Homestead

Description: Erosion and Sediment Control Plan - Schematics

# enviroscope

Drawn	Approved	Date	Drawing Number	Revisio
WT	TG	29/07/2024	ESCP - 010	В



#### on



## **APPENDIX 2** Calculations for Erosion and Sediment Controls

#### DIRTY WATER DIVERSION CHANNEL CALCULATIONS - GODLEY PEAK STATION - REVISION B

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Specifications	Value 1	Value 2	Value 3 V	Value 4	Value 5	Units	Reference/Notes
Site Details							
Contributing catchment					1.5	5 ha	ECan GIS + Google Earth
Design rainfall event					0.05	5 AEP	5% AEP as required by GD05
Time of Concentration							
Overland sheet flow path length (L)					230	0 m	
Hortons roughness value (n)					0.2	2	
Slope of surface (S)					3.8	8 %	
Time of Concentration (Tc)					12.4	4 minutes	
Rounded Tc to align with HIRDS					10	0 minutes	
Rational Method: Q = (C*I*A)/360							
Area ground cover	Grass	Concrete	Forest	Shrubs	Bare soi	il	
Proportion of catchment	0	0	0	0	) :	1	
Runoff coefficient (C)	0.4	1	0.25	0.5	0.8	8	Manning's Roughness Coefficient (n)
Rainfall intensity (I)	42.7	42.7	42.7	42.7	42.7	7 mm	NIWA HIRDS, 10 min (Tc), 5% AEP
Catchment Area (A)	0.00	0.00	0.00	0.00	1.50	0 ha	
Qp (Peak runoff flow)	0.0000	0.0000	0.0000	0.0000	0.1423	3 m3/s	Rational Method: Q = CIA
Total Qp (Peak runoff flow)					0.1423	3	
Channel Design							Manning's Formula Uniform Trapezoidal Channel Flow
Bottom Width					200	0 mm	
Batter ratio= 1 to					2	2 ratio	
Manning's roughness coefficient of channel (n)					0.025	5	Gravelly earth channel
Channel slope					3	3 %	
Flow depth					200	0 mm	
Channel depth					400	0 mm	
Flow (Q)					0.1905	5 m3/s	
Buffer					34	4 %	
Top width					1000	0 mm	
Additional Controls							
Drop out pit					Ye	s	
Check dams					Ye	s	
Geofabric lining					No	D	

#### **SEDIMENT BASIN 1 - GODLEY PEAK STATION - REVISION B**



Specification	Value	Value2	Value3	Value4	Value5	Units	Source / Notes / Reference
Site details							
Contributing catchment					2.20	ha	ECan GIS/Survey Plans
Project duration					1.0	year	
Design Storm Event					1-hr, 5% AEP		
NZTA Sizing Storage Requirements							Section 6.7 of NZTA ESC Guidelines, Peak runoff (Rational Method Q = 0.00278CiA)
Area groundcover	Asphalt	Grass	Subsoil	Topsoil	Aggregate		
Proportion of sub catchment	0.00	0.10	0.50	0.30	0.10	Proportion	It is recommended that the main building platform will be progressively capped with clean aggregate
C (Runoff Coefficient)*	0.99	0.55	0.70	0.50	0.90		
I (Rainfall Intensity)	21.1	21.1	21.1	21.1	21.1	mm/hr	NIWA HIRDS 1-hr, 5% AEP
A (Catchment Area)	0.00	0.22	1.10	0.66	0.22	ha	
Qp (Peak runoff flow)	0.0000	0.0071	0.0452	0.0194	0.0116	m/s	
Storage volume required	0.00	25.55	162.60	69.69	41.81	m3	
Total Storage required volume					274.10	m3	
Sediment Basin Design Specification	s						
Top length (A)					28.50	m	
Top width (B)					9.50	m	
Base length (a)					26.10	m	
Base width (b)					7.10	m	
Depth (h)					1.20	m	
Internal batter ratio= 1 to					1	ratio	Inlet batter is 1:3, Less than 2:1 requires lining
Actual volume (v)					272.48	m3	
Width to length ratio					3:1	ratio	Length to width ratio considered appropriate due high soakage rates
External batter ratio= 1 to					2	ratio	
RL of Sediment Basin inlet					735	m	
RL of Sediment Basin base					733.80	m	
Soakage							
Duration of design event					1	hours	
Soakage rate					25	mm/hr	Factored soakage rate of 25 mm/hr in Geotago report
Soakage depth for design event					0.025	m	
Soakage volume for design event					4.63	m3	
Effective volume including soakage					277.12	m3	
Buffer					1.10%		
Treatment Train Additions							
Drop out pit				```	Yes		
Batch dosing				,	Yes		
RADS unit					No		May be added as a contingency measure
Check dams				,	Yes		

#### SEDIMENT BASIN 2 - GODLEY PEAK STATION - REVISION B



Specification	Value V	/alue2 \	/alue3	Value4	/alue5	Units	Source / Notes / Reference
Site details							
Contributing catchment					2.10	ha	ECan GIS/Survey Plans
Project duration					1.0	year	
Design Storm Event					1-hr, 5% AEP		
NZTA Sizing Storage Requirements							Section 6.7 of NZTA ESC Guidelines, Peak runoff (Rational Method Q = 0.00278CiA)
Area groundcover	Asphalt	Grass	Subsoil	Topsoil	Aggregate		
Proportion of sub catchment	0.00	0.10	0.50	0.30	0.10	Proportion	Driveway will be progressively capped with clean aggregate
C (Runoff Coefficient)*	0.99	0.55	0.70	0.50	0.90		
I (Rainfall Intensity)	21.1	21.1	21.1	21.1	21.1	mm/hr	NIWA HIRDS 1-hr, 5% AEP
A (Catchment Area)	0.00	0.21	1.05	0.63	0.21	ha	
Qp (Peak runoff flow)	0.0000	0.0068	0.0431	0.0185	0.0111	m/s	
Storage volume required	0.00	24.39	155.21	66.52	39.91	m3	
Total Storage required volume					261.64	m3	
Sediment Basin Design Specifications							
Top length (A)					28.50	m	
Top width (B)					9.50	m	
Base length (a)					26.10	m	
Base width (b)					7.10	m	
Depth (h)					1.20	m	
Internal batter ratio= 1 to					1	ratio	Inlet batter is 1:3, Less than 2:1 requires lining
Actual volume (v)					272.48	m3	
Width to length ratio					3:1	ratio	
External batter ratio= 1 to					2	ratio	
RL of Sediment Basin inlet					722	m	
RL of Sediment Basin base					720.80	m	
Soakage							
Duration of design event					1	hours	
Soakage rate					25	mm/hr	Factored soakage rate of 25 mm/hr in Geotago report
Soakage depth for design event					0.025	m	
Soakage volume for design event					4.63	m3	
Effective volume including soakage					277.12	m3	
Buffer					5.92%		
Treatment Train Additions							
Drop out pit				Y	/es		
Batch dosing				Y	/es		
RADS unit				1	No		May be added as a contingency measure
Check dams				١	/es		



## **APPENDIX 3** Environmental Site Induction Handout

#### ENVIRONMENTAL SITE INDUCTION HANDOUT

#### Key Roles and Responsibilities

Role	Responsibilities
Project Manager	The Project Manager is responsible for the effective implementation of the EMP and has overall responsibility for the environmental performance of the project. Duties include:
	<ul> <li>Ensuring adequate resources are in place to implement the EMP.</li> <li>Ensuring all staff and sub-contractors operate within the guidelines of the EMP.</li> <li>Ensuring that an EMP is prepared and that environmental standards, processes and procedures meet relevant resource consent conditions.</li> <li>Overseeing the successful implementation, monitoring and review of the EMP.</li> <li>Ensuring that inspections are carried out in accordance with the relevant EMP.</li> <li>Restricting or stopping any activity that has the potential to or has caused adverse environmental effects.</li> <li>Providing notification and reporting of Environmental Incidents to Council and other environmental reports as required by The Guidelines.</li> <li>Delegating authority of the above responsibilities.</li> </ul>
Environmental Representative	The Environmental Representative supports the Project Manager in the day-to-day implementation of the EMP. Duties include:
	<ul> <li>Ensuring the installation of environmental controls as per the EMP.</li> <li>Undertaking environmental site inspections.</li> <li>Overseeing the maintenance and improvement of defective environmental</li> </ul>
	controls.
	<ul> <li>Assisting the project leadership in attending to Environmental Incidents and Complaints.</li> </ul>
	The Environmental Representative shall be familiar with environmental risks associated with the project, the EMP and best practice erosion and sediment control principles and practices.
All staff and sub- contractors	All staff and sub-contractors have a responsibility to undertake all activities in accordance with the requirements of this EMP. This includes reporting any activity that has the potential to or has resulted in an Environmental Incident to the Project Manager or Environmental Representative.

## Key Environmental Locations

Environmentally sensitive receptors: Nearby waterbodies such as Lake Tekapo, Cass River, Micks Lagoon and the unidentified wetland area.

#### **Key Resource Consent Conditions**



It is important to comply with all relevant resource consent conditions in order to avoid or mitigate adverse environmental effects.

The site EMP has been prepared in response to all environmental-related conditions of consent and therefore provides direction for how compliance with these conditions will be achieved. Provided that the EMP is followed, the project will at the same time comply with all conditions of consent.

#### Limits of Clearing

The sequencing of works is a key component to ensure that environmental effects of construction are appropriately managed. It is <u>imperative</u> that the sequencing outlined in Section 2.1 of the EMP is followed so that the site is stabilised in the most efficient manner.

All staff should be familiar with this sequence. Any potential changes to that sequence need to be approved by the Project Manager which will be discussed first with the Environmental Consultant.

#### Key Environmental Management Measures in EMP

#### Erosion and Sediment Control (Section 4 of EMP)

- Direction provided in Erosion and Sediment Control Plan (ESCP) in Appendix 1 of EMP.
- Separation of clean and dirty water is the most important principle to ensure that the contributing catchment of dirty water that needs to be treated is as small as possible.
- Progressive stabilisation (revegetation) of disturbed areas will ensure that the extent and duration of exposed soil is minimised. Keep it covered!
- All controls to be checked immediately before storm events to ensure they are in good-working order.
- Erosion and sediment control devices to remain in place until site is stabilised (defined as 80% vegetative cover).

Any works that disturb the controls outlined on the ESCP must be reinstated before moving to the next task.

#### Water Quality Management (Section 5 of EMP)

- Any water caught in the sediment devices to be re-used in dust suppression where possible and if required.
- Any observations of dirty water running offsite to be reported directly to the Project Manager.

#### Dust Management (Section 6 of EMP)

- Dust suppression should occur on any exposed soil on unsealed roads, this can be done using the water caught in the retention basin.
- Avoid all unnecessary vegetation clearing that exposes soil and work should be conducted in stages as this can increase the impact from dust in the event of strong winds.
- During high wind events and dust suppression is becoming difficult works must cease until more favourable weather conditions.
- Constant vigilance should be maintained onsite to ensure that dust is appropriately managed and weekly monitoring should be completed to ensure that management measures are effective.

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#### Noise and Vibration Management (Section 7 of EMP)

- Noise producing works only be undertaken during the hours of 0630-1800 from Monday-Saturday and no works to be completed on Sundays or public holidays.
- Particularly noisy work should be completed during the middle of the day during business hours.
- Noise dampening should occur when possible.
- Weekly site inspections should be undertaken by the Environmental Representative to ensure the strategies in place are effective.

#### Cultural Heritage Management (Section 8 of EMP)

- If any artefacts are found works must stop within 20 meters of the discovery and the site manager notified immediately.
- The site manager must then secure the area and notify the Heritage New Zealand Regional Archaeologist, who will advise when works can begin again.

#### Vegetation Management (Section 9 of EMP)

- Maintain vegetated surfaces as far as reasonably possible.
- Maintain protected or indigenous vegetation.
- Complete all landscaping and or ecological restoration in accordance with approved plans.

#### Chemicals and Fuel Management (Section 10 of EMP)

• Chemicals and fuels are stored and used so not to cause contamination of works areas and surrounding environment.

#### Contaminated Land Management (Section 11 of EMP)

- Prevent spread of contamination.
- Engage the Environmental Consultant (SQEP) to ensure that the site can be managed in accordance with statuary requirements (i.e., National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health).

#### **Environmental Incidents**

The procedure for managing environmental incidents is outlined in Section 3.5 of the EMP, however these can be summarised as follows:

- Environmental incidents must be reported as soon as they occur, and the Project team must respond immediately to mitigate further environmental impacts.
- Investigation into the cause of the incident should be completed and a solution should be constructed to remediate the Environmental damage.
- The Project Manager must then notify the MDC and/or the ECAN of the details of the incident within 12 hours of being made aware of the incident.



### **Rapid Response for Storm Events**

The procedure for rapid response to storm events is outlined in Section 4.6 of the EMP, however these can be summarised as follows:

- The Project Manager will observe and understand the **weather forecast** throughout the project to ensure appropriate preparation onsite.
- If a **significant storm** event is forecast all works should stop within an appropriate amount of time to inspect ESC devices and undertake any maintenance or site stabilisation required.
- The sediment controls should be in operating condition and fully functional.
- During the storm event the site should be monitored to sure the functioning of the ESC devices and maintained if required.

When storms are forecast it is crucial that tools are downed in time for the rapid response procedure to be implemented. This will help avoid environmental incidents, potential enforcement action and site shutdown.



APPENDIX 4 Environmental Site Induction Register

## ENVIRONMENTAL SITE INDUCTION REGISTER

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Name	Organisation	Date Inducted	Induction Delivered by	Signature



## APPENDIX 5 Weekly Environmental Site Inspection Form

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### WEEKLY ENVIRONMENTAL SITE INSPECTION FORM

Environmental Representative:

Date:

ltem				Yes	No	Com	ment		
General									
Is the EMP availabl	le onsite?								
Have any environmental incidents occurred during the week? If so, provide details						*lf y repo	*If yes, complete environmental incident report.		
Complete descripti	ion of weather for	upcoming week – cii	rcle applicable						
Monday	Tuesday	Wednesday	Thursday	Fri	day		Saturday	Sunday	
<ul> <li>♦ ● ● ● ●</li> <li>● ● ●</li> <li>● ● ●</li> <li>● ●</li> </ul>	♦ ○ 9 #				<ul> <li>♣ <sup>*</sup></li> <li>♣</li> </ul>	<b>ک</b> چ	♦ ○	♦ ○	
Are there any rain	events forecasted	for the coming week	?						
Have pre rain even	t inspections been	completed?							
Have post rain eve	nt inspections beer	n completed?							
Water Quality									
Is water quality mo site boundaries?	onitoring occurring	when water is flowi	ng across the			*If y mon	es, complete water itoring form	quality	
Is there visual evid waterways/drainag	ence of sediment f ge lines?	rom the constructio	n site entering						
Does water in sedi before being disch	ment retention dev arged?	vices meet water qu	ality criteria						
Are daily visual ins by the Project Mar	pections of waterw nager?	ays being conducted	d and recorded						
Erosion and Sediment Control									
Are works contained within the current stage and site boundaries?									
Are completed areas being progressively stabilised?									
Is there any new ev	vidence of erosion?								
Are erosion and se	diment controls ins	stalled as per the ES	CP?						

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ltem	Yes	No	Comment
Is dirty water entering dirty water diversion channels during rain events?			
Do sediment controls have over 80% capacity?			
Cultural Heritage			
Have any finds of cultural significance been found?			
Noise and Vibration			
Have any complaints been received during the week?			*If yes, complete Complaints Register
Are nearby sensitive receptors being notified before significant noise and/or vibration causing activities?			
Are works only occurring within the hours of operation?			
Dust			
Have any complaints been received during the week?			*If yes, complete Complaints Register
Are works being staged to minimise soil exposure?			
Have completed areas been revegetated or stabilised?			
Is dust suppression of disturbed work areas and stockpiles occurring?			
Are works ceasing during high winds?			
Are only designated access points and haul routes being used?			
Is the site access and surrounding roads swept clean of sediment?			
Vegetation			
Are vegetated surfaces being maintained as far as reasonably possible?			
Contaminated Soils			
Have any contaminants been uncovered during excavations?			
Chemicals and Fuels			
Are all hazardous substances on site stored, transported and used according to the safety data sheet requirements?			
Are vehicles and plant being refuelled in the refuelling bay?			
Is concrete washing being undertaken in the concrete wash-out pit?			

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Item	Yes	No	Comment
Is there an adequate supply of spill kits onsite? Have any used materials been replaced?			
Waste			
Is the site in a safe, clean and tidy state?			
Are wastes segregated into labelled bins with lids?			
Are skip bins not overfilled?			
Is waste removed from open drains and drainage paths?			

Actions resulting from this inspection must be forwarded to the Project Manager any actions should be recorded in the Non-Conformance Register – Appendix 8.

Additional Comments:

Names and Signatures of inspection attendees:



APPENDIX 6 Environmental Incident Report Form

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### ENVIRONMENTAL INCIDENT REPORT FORM

Project Address:	Consent Number:
Brief Project Description:	

<u>Instructions-</u> Complete this form for all environmental incident that cause contaminants (including sediment) or environmental nuisance to leave the site. Be succinct, stick to known facts and do not make assumptions. Once completed submit to the respective local authorities.

Date and Time	Date: XX/XX/XX	X Time: X	X:XX hours	
Description?				
Provide a brief and factual description of what happened				
during the incident, include relevant details such as:				
<ul> <li>The activity being undertaken when the incident occurred</li> </ul>				
<ul> <li>The estimated distance to nearest waterway (include stormwater and dry courses)</li> </ul>				
- The estimated distance to the nearest sensitive receiver				
Sketches/diagrams/photos may be referenced and				
appended to this report to aid in the description of the incident.				
Exact Location of the incident?				
Include address, landmarks, features, nearest tree, etc.				
Maps and plans can be attached.				
Quantity or volume of material escaped or causing				
incident? (provide and estimate quantity)				
Who identified the incident?	Contractor 🗆	Council 🗆	Community 🗆	Other 🗆

What immediate actions/control measures were taken to rectify or contain the incident?

What initial corrective action will be taken to prevent similar incidents recurring in the near future?

Has the Mackenzie District Council been notified?	Yes 🗆	No 🗆	Will be no	tified 🗆
Has Environment Canterbury Regional Council bee	n notifie	d? Yes	🗆 No 🗆	Will be notified $\Box$

Role of person making report: Project Manager / Site Supervisor / Environmental Representative / SQEP					
Name	Signature				
Organisation	Date				
Mobile phone number					



## APPENDIX 7 Environmental Complaints Register

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### ENVIRONMENTAL COMPLAINTS REGISTER

Complaint #	Date and Time Received	Complainant details (name, address, phone number)	Details of Complaint	Investigation and Findings	Outcome	Close out Date



APPENDIX 8 Environmental Non-Conformance Register

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### ENVIRONMENTAL NON-CONFORMANCE REGISTER

Ref Number	Date Observed	Found via (e.g., inspection, monitoring, complaint?)	Details of Non-conformance	Corrective Actions	Updated by	Close out Date


APPENDIX 9 Water Quality Monitoring Results Form



## **Godley Peaks Station**

## WATER QUALITY MONITORING RESULTS FORM

Date		Monitoring Trigger		Location Description	
			Yes	No	Measurement
Is the clarity of the water more than 100 mm?					mm
Is turbidity less than 175 NTU?					NTU
Is the pH of the water between 5.5-8.5?					рН
Are total suspended solids less than 50 mg/L?*				mg/L	
Are hydrocarbons visible?					
Are tannins visible in the water?					
Is there any waste in the water?					
<ul> <li>Description of any non-conformance and actions required:</li> </ul>					
Include images of sampling location:					

## **Godley Peaks Station**

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### HOW TO: WATER QUALITY SAMPLING

### 1. Select a Sampling Location

### Sampling a discharge

Collect sample where water crosses the site boundary or enters a sensitive receptor from a retention device. Always photograph the location you sample from.

### Sampling a waterway

Collect sample from the centre of the flow and the top third of the water column where possible.









### Sampling a from a Sediment Retention Device

Collect sample from the discharge location, this is either near the decanting arms, spillway, hose or the outlet pipe.





## **Godley Peaks Station**

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TTE NAME

SRP 1 27-03-2023

10.50 am

### 2. Collect a Water Sample

#### **Taking a Water Sample**

- → Label container with site name, sampling location, date and time taken.
- → Fill the container with water from the surface of your sampling location.

If you wade into the water to collect the sample, always collect the sample 'upstream' of where you're standing to avoid contamination by disturbed sediment.

Always ensure your meters are calibrated regularly to ensure accurate sampling results.

### 3. Measure and Record Turbidity, Clarity, and pH



### Measuring Turbidity using a Turbidity Meter

→ Fill the turbidity pottle with the sampled water. Wipe away any moisture on the outside of the pottle and insert it into the meter. Turn the meter on and once the standby value appears press read. Record the turbidity value.

### Measuring Clarity using a field testing seechi disc

→ Lower the seechi disc into the water sample until you can no longer see the disc. Then lift the seechi disc back up until the disc is just visible. Record the number where the water level sits.





### Measuring pH using a pH Meter

→ Submerge the probe of the pH meter into the water sample. Keep the probe in the water until the value on the meter is fixed. Swirling the probe can help the value fix faster. Record the pH value.



## APPENDIX 10 Archaeological Discovery Protocol



HERITAGE NEW ZEALAND Pouhere taonga

### Heritage New Zealand Pouhere Taonga Accidental Discovery Protocol

# This protocol does not apply when an archaeological authority issued under the Heritage New Zealand Pouhere Taonga Act 2014 is in place.

Under the Heritage New Zealand Pouhere Taonga Act (2014) an archaeological site is defined as any place in New Zealand that was associated with human activity that occurred before 1900 and provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand. For pre-contact Māori sites this evidence may be but is not limited to, bones, shells, charcoal, stones etc. In later sites of European/Chinese origin, artefacts including but not limited to bottle glass, crockery etc. may be found, or evidence of old foundations, well, drains, or similar structures. Burials/kōiwi may be found in association with any of these cultural groups.

In the event that an unidentified archaeological site is located during works, the following applies;

- 1. Work shall cease immediately at that place and within 20m around the site.
- 2. The contractor must shut down all machinery, secure the area, and advise the Site Manager.
- 3. The Site Manager shall secure the site and notify the Heritage New Zealand Regional Archaeologist. Further assessment by an archaeologist may be required.
- 4 If the site is of Māori origin, the Site Manager shall notify the Heritage New Zealand Regional Archaeologist and the appropriate papatipu rūnaka of the discovery and ensure site access to enable appropriate cultural procedures and tikaka to be undertaken, as long as all statutory requirements under legislation are met (*Heritage New Zealand Pouhere Taonga Act, Protected Objects Act*).
- 5. If human remains (kōiwi) are uncovered the Site Manager shall advise the Heritage New Zealand Regional Archaeologist, NZ Police and the appropriate papatipu rūnaka and the above process under 4 shall apply. Remains are not to be moved until such time as papatipu rūnaka and Heritage New Zealand have responded.
- Works affecting the archaeological site and any human remains (kōiwi) shall not resume until Heritage New Zealand Pouhere Taonga gives written approval for work to continue. Further assessment by an archaeologist may be required.
- 7. Where iwi so request, any information recorded as the result of the find such as a description of location and content, is to be provided for their records.
- 8. Heritage New Zealand Pouhere Taonga will advise if an archaeological authority under the *Heritage New Zealand Pouhere Taonga Act* 2014 is required for works to continue.

It is an offence under S87 of the *Heritage New Zealand Pouhere Taonga Act 2014* to modify or destroy an archaeological site without an authority from Heritage New Zealand irrespective of whether the works are permitted or consent has been issued under the Resource Management Act.

Heritage New Zealand Pouhere Taonga Archaeologist contact details:

Nikole Wills Regional Archaeologist Otago/Southland Heritage New Zealand PO Box 5467 Dunedin Ph. +64 3 470 2364, mobile 027 240 8715 Fax. +46 3 477 3893 nwills@heritage.org.nz