

The total exposed area is 4400m². To limit the area of earthworks exposed at any one time to less than 2500m² the driveway will be constructed as stage 1 and stabilised with a gravel surface prior to preparing the building platform as the second stage.

To limit the need the need for any significant sediment retention controls the driveway will be constructed from the bottom up using a “cut and cover” methodology for ongoing stabilisation and during a fine weather window. Refer below for further details.

Relevant site features

The site has a pasture ground cover with native scrub scattered in various concentrations. The area of earthworks is undulating and sloping up to the north and east. Downslope of the works area there is an existing driveway with a grassed swale that will intercept runoff from the works area and convey that along the private driveway for some 600m before reaching Wanaka-Mt Aspiring Road. There is a watercourse with some ponding areas 60m-80m to the northwest however, there are two driveways that are in-between that will intercept any overland flows before they could reach this watercourse. There is no potential for runoff to reach Lake Wanaka.

Flow paths / Stormwater catchments

There are no concentrated overland flow paths within the earthworks area. The site is gently undulating with an average gradient of approximately 10 degrees or 1:5. The works area sits below a ridge line to the east and the contributing stormwater catchment above the clean water diversion is 2500m²-3000m², as shown below;



Draft EMP Construction Methodology / Control installation sequence

Construction methodology as it relates to erosion and sediment control. To be confirmed once a contractor has been engaged;

1. Soil stripping and subsequent earthworks be undertaken only when a suitable interval of fair weather is expected, during the earthworks construction season.
2. Install a clean water diversion above the earthworks area to divert runoff away from the earthworks.
3. Install a silt sock across the existing grassed driveway swale below the works area.
4. Begin access construction from the bottom up, using the cut and cover methodology. Undertake work in fair weather intervals and stabilise the driveway surface and swales as progress moves up the driveway. The

number of stages required is to be judged by the contractor subject to weather window and available resources.

5. Install a silt fence below the building platform and landscape mound. Ensure the sides of the fence go up the slope on each side at least 500mm so that a dam is created by the silt fence to impound stormwater and allow any sediment to drop out. Use at least one tie back from the middle of the fence upslope and well anchored.
6. Undertake earthworks for the level building platform.
7. Grass and/or plant all exposed areas.
8. Decommission silt fence and fill to level the soakage area, once 80% vegetative cover on exposed areas has been achieved.

Type and Location of Erosion and Sedimentation Controls

Erosion and sediment control will be generally undertaken in accordance with the *Guidance Document 2016/005: Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05)*. The ESCP will be updated as and when required as the project progresses.

Refer to Appendix 1 for a copy of the ESCP

Stabilised entrance

There is more than 500m of private gravel road between the works area and the public road. The new driveway will be constructed with a cut and cover methodology, stabilising the surface as it progresses up the hill. For these reasons no specific stabilised entrance needs to be constructed.

Cut and Cover driveway construction methodology

The cut and cover technique is an effective erosion and sediment control method, particularly suited to road construction on slopes and in areas where rapid progress is essential. This methodology minimises the duration of exposed soil, reducing the likelihood of erosion, sediment discharge, and environmental impact.

Site Preparation and Planning

Plan work around favourable weather windows. Avoid opening new areas if rain exceeding 50mm is forecast within the next 48 hours. Select days with fine weather to maximize efficiency and reduce erosion risk.

Minimise Disturbance: Limit the extent of open excavation areas. Only open as much ground as can be stabilised within the workday. This minimizes soil exposure to wind and rain.

Work from the bottom of the driveway up, so that it is progressively stabilised.

Immediate Stabilisation Measures

Glacial till is expected at approximately 1m deep. This material is subject to high rates of erosion so ensure no glacial till is left exposed to rainfall.

Line swales with permanent rock rip rap (and potentially geotextile) in accordance with civil engineers instructions. This slows down the velocity of water and prevents erosion of the swale. It will also capture sediment from the initial wash of the imported AP65/AP40 roading aggregate.

Subject to ground conditions and instructions from the engineer, lay AP65 subbase and compact to create a stabilised surface, and/or final running course of AP40 compacted to create a stabilised surface.

If the surface cannot be stabilised with aggregate when a rain event is forecast apply straw or mulch to exposed areas immediately after excavation. Mulch provides an instant surface cover to reduce raindrop impact, stabilise loose soil, and minimise erosion.

For steeper slopes or highly erodible areas (such as exposed glacial till), install geotextiles or erosion control blankets. These materials stabilise soil and provide a barrier against erosion, especially from rain impact and minor surface runoff.

Runoff Control

A clean water diversion will be installed upslope of the driveway to direct clean water away from exposed soil areas.

Daily Site Management

At the end of each workday, backfill or cover open cut areas with gravel, base course, or mulch as needed. For areas that cannot be stabilised immediately, cover with geotextile fabric or applying mulch to reduce erosion.

As soon as practical, establish permanent vegetation on exposed soil areas to provide long-term stabilisation. Consider hydroseeding for fast establishment.

Silt Fences

Key construction criteria for silt fences:

- Ensure silt fence height is 600 mm above ground level and 200 mm below ground level
- Maximum slope lengths, spacing of returns and angles for silt fences are shown in Table 12
- Locate supporting waratahs for silt fences 2-4 m apart with support provided by a tensioned wire (2.5 mm HT) along the top of the silt fence
- Where a strong woven fabric is used in conjunction with a wire support, the distance between posts can be up to 4 m. Double the silt fence fabric over and fasten to the wire with silt fence clips at 500 mm spacings
- Ensure supporting posts/waratahs are embedded a minimum of 400 mm into the ground
- Always install silt fences along the contour (at a break in slope). Where this is not possible, or where there are long sections of silt fence, install short silt fence returns (refer Figure 81) projecting up-slope from the silt fence to minimise the concentration of flows. Silt fence returns should be a minimum 2 m in length and can incorporate a tie-back. They are generally constructed by continuing the silt fence around the return and doubling back, eliminating joins
- Join lengths of silt fence by doubling over fabric ends around a waratah or by stapling the fabric ends to a batten and butting the two battens together as shown in Figure 82
- Install silt fence returns at either end of the silt fence, projecting up-slope to a sufficient height to prevent outflanking in accordance with this table;

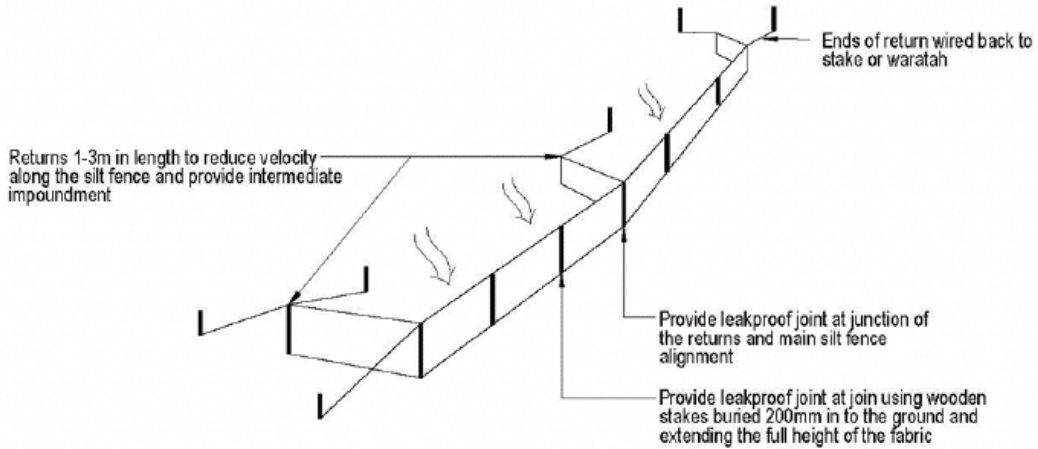
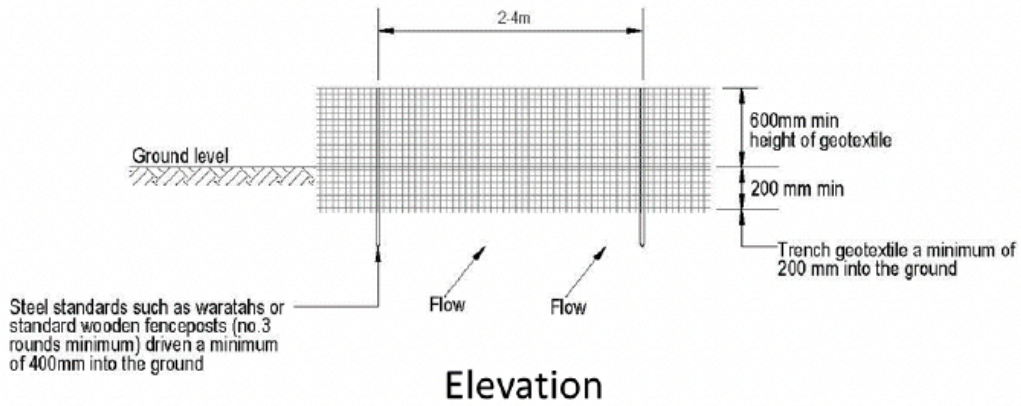
Slope steepness %	Slope length (m) (maximum)	Spacing of returns (m)	Silt fence length (m) (maximum)
Flatter than 2%	Unlimited	N/A	Unlimited
2 – 10%	40	60	300
10 – 20%	30	50	230
20 – 33%	20	40	150
33 – 50%	15	30	75
> 50%	6	20	40

- Where water may pond regularly behind the silt fence, provide extra support for the silt fence with tie-backs from the silt fence to a central stable point on the upward side. Extra support can also be provided by stringing wire between support stakes and connecting the filter fabric to this wire.

Silt Fence Standard Details

Also refer to GD05 Section F1.3.2 Page 117 for construction and maintenance details

To ensure the ongoing performance of the silt fence collected sediment must be removed once 20% capacity has been reached



Silt fence with returns and support wire



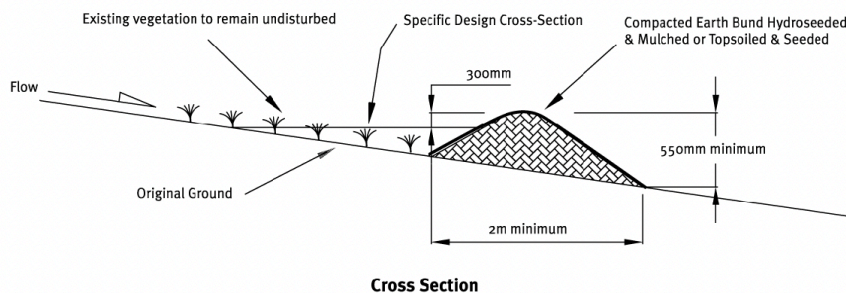
Silt Sock

A minimum 150mm silt sock will be used to temporarily impound any sediment laden runoff off from the new driveway area. It should be installed when there is a risk of dirty water flowing off the site and into the main driveway swale. In this situation install it prior to significant rainfall events where surface flows would occur, and when the site is unattended overnight.

Clean Water diversion

A CW diversion channel will be installed at the commencement of the earthworks to divert the sheet flow around the earthworks. The slope gradient is approx 10 degrees there is ample area available to construct this with a longitudinal gradient of <2% to avoid the need for channel lining. The channel and the bund will be stabilised with grass seed. The total catchment is approximately 0.3ha. Rip rap is to be installed at the discharge end for energy dissipation to prevent scouring. The design for the channels is the "standard" GD05 design (Figure 16, pg 41). Also refer to GD05 Section E2.1.2 Page 42 for construction and maintenance details

- Survey the alignment so that the longitudinal gradient does not exceed 2%.
 - Discharge is into existing watercourses as shown on the ESCP.
 - Install energy dissipation at each end as necessary to prevent scour/erosion.
- The diversion channels should be parabolic or trapezoidal in shape
 - Ensure the internal sides of the bund associated with the diversions are no steeper than 3:1, and the external sides no steeper than 2:1, as outlined in Figure 16 below.



Emergency Response Procedure

When a significant rain event (one that can generate overland flow and/or with an intensity of 25mm/24hr or 15mm/hr is forecast the following emergency responses will be undertaken by the Environmental Representative;

1. Stop works in time to inspect and repair or modify the silt fence and cut off drain.
2. Stabilise and/or cover all exposed surfaces as much as possible.
3. Cover any stock pile or un stabilised landscape mound with an impermeable material.
4. Ensure the surface of the silt fence is not glogged and there is no sediment built up against the fence, muck out if necessary.
5. Observe weather and check all ESCP controls throughout the event.

Water Quality Monitoring

The Contractor will at all times undertake reasonable and practicable management measures to avoid adverse environmental effects within the site or adjacent land into which the site discharges. The Erosion and Sediment Control Plan Appendix 1 demonstrates the method for preventing the migration of sediment beyond the site boundaries.

There are no immediate water bodies that could be affected. Runoff from the site is collected in a long (600m) driveway grassed swale before reaching Wanaka-Mt Aspiring Road where it is conveyed in roadside drainage. As



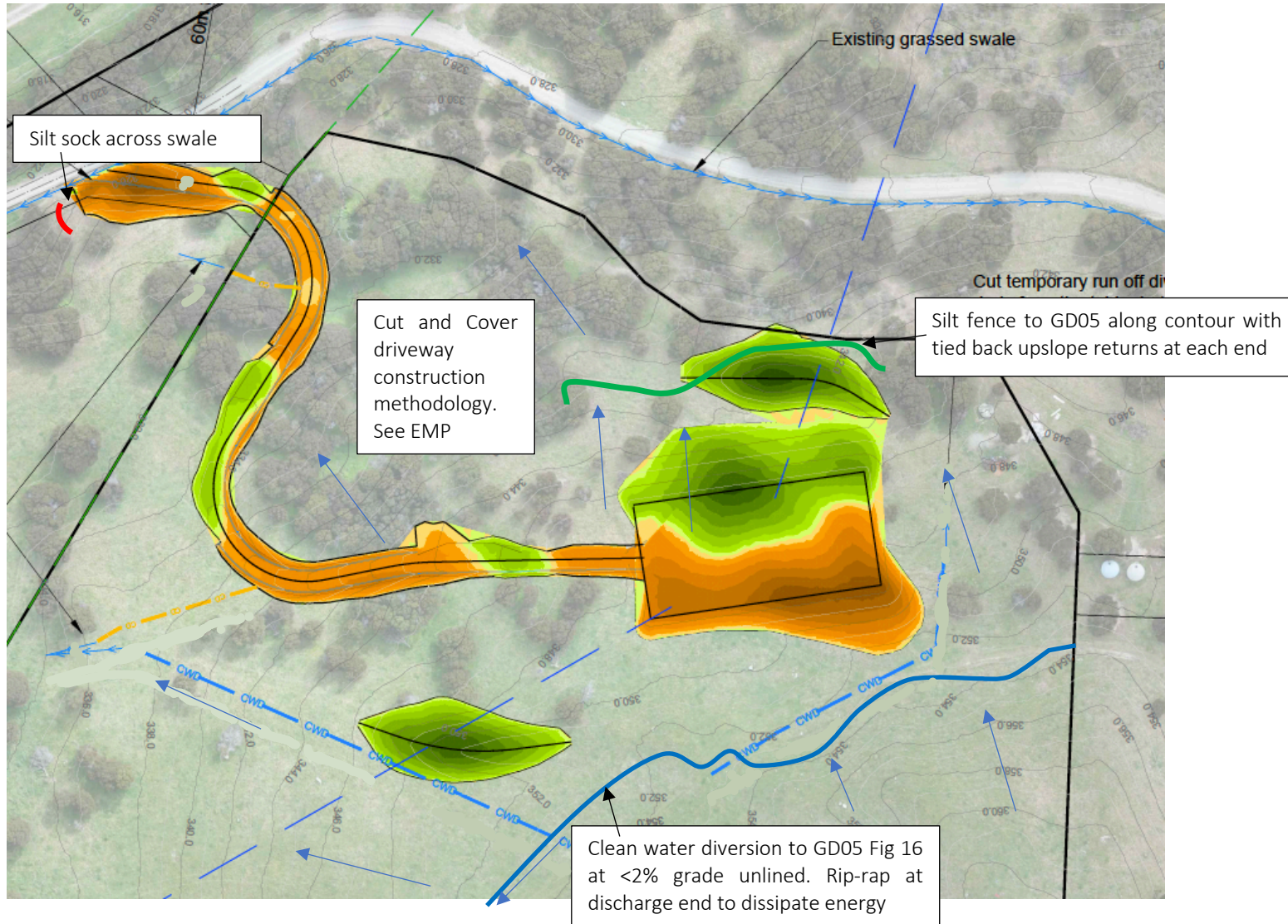
a result there is negligible risk of any sediment generated from this project reaching a waterbody or sensitive receiving environment.

Visual monitoring will occur daily and during/following rain events to check the existing grassed driveway swale and behind the silt fence that no sediment is leaving the area. If it is, follow it downslope and ensure that it is not reaching the property boundary at Wanaka-Mt Aspiring Road. All water leaving the site must meet the relevant resource consent conditions and the following criteria as defined in the QLDC Guidelines for the Preparation of EMPs, with the exception of pH which has a lower limit of 5.5 as per GD05;

WATER QUALITY PARAMETER	DISCHARGE CRITERIA
Turbidity (measured with nephelometer)	<100 NTU
TSS Total Suspended Solids (lab test sample)	<50 mg/L
pH (measured with pH strips or handheld device)	Stable reading between 5.5-8.5
Hydrocarbons or tannins	No visible trace
Waste	No waste or litter is visible

Observations and any preventative measures taken are to be recorded in a daily job diary. If there are any visual signs of sediment crossing property boundaries call the Environmental Consultant Steve Hewland of Hewland Projects immediately and stop work that could be causing it. Review controls and look for opportunities to reduce the risk of sediment load in locations that have been shown to pass sediment through the fence. If possible a turbidity measurement will be taken at the sediment location using a calibrated handheld nephelometer (or sent to a lab for TSS analysis). If 100NTU is exceeded, and/or obviously sediment laden water has crossed the boundary this constitutes an environmental incident so refer also to the "Notification and management of environmental incidents" section above.

Hewland
PROJECTS LIMITED
Appendix 1 - ESCP





Appendix 2 - SITE ENVIRONMENTAL INDUCTION

The purpose of this site environmental induction is to ensure that all staff and subcontractors onsite are aware of their environmental responsibilities. This induction is given to every contractor working on site during the earthworks phase by the Environmental Representative. Each recipient of this induction will sign the induction register.

Address		
ORC Consent Number (if applicable):	RM	
District or City Council Consent Number (if applicable):	RM	
Resource consent holder/representative:		
Name		Phone No. <input type="text"/>
Contractor:		
Name		Phone No. <input type="text"/>
Environmental Representative:		
Name		Phone No. <input type="text"/>
SQEP:		
Name		Phone No. <input type="text"/>

Roles and Responsibilities

- **TBC** is the Environmental Representative for this project. The environmental reps role is;

Implementation of environmental management

- > Ensure installation of environmental controls as per this EMP
- > Undertake environmental site inspections of the project
- > Oversee the maintenance and improvement of defective environmental controls
- > Undertake Environmental Incident reporting

Communication

- > Keep project leadership informed of environmental performance of the project
- > Inform staff of procedures and constraints applicable to managing specific environmental issues
- > Responsible for providing environmental inductions to all staff and sub-contractors

Complaints and Incidents

- > Attending to Environmental Incidents and Complaints

- a) **Specific locations within the site of environmental significance or risks, including Exclusion Zones and Sensitive Environmental Receptors, Fuelling areas, Stockpile areas.**

There is no significant environmental risk on this site. Follow best practice at all times.



b) Scope and conditions of resource consents applicable to the works.

Resource consent has not yet been issued. When it is the following is to be included in this induction;

- Any specific conditions for this site/activity
- Chemical Treatment Management Plan (CTMP) explained if relevant to the site, and understood
- Contaminated land procedures explained if relevant to the site, and understood

c) The limit of clearing and earthworks for each Stage of works as outlined in the EMP

Do not take machinery or vehicles outside of the areas that have been (or are in the process of being) stripped of topsoil.

d) Environmental management measures stipulated in the EMP

The key items in managing erosion and sediment on this project are listed below.

The clean water diversion above the works area is critical to reduce the amount of water that can reach the earthworks areas, this needs to be constructed before any other works commence and needs to be in good order at all times.

The silt fence will impound runoff from the building platform earthworks. Inspect this weekly, after a rain event, and prior to a forecast heavy rain event.

- Check for damage including rips, tears, bulges in the fabric, broken support wires, loose waratahs, overtopping, outflanking, undercutting, and leaking joints in fabric,
- Make any necessary repairs as soon as identified,
- As the geotextile material becomes clogged with sediments, this will result in increased duration of ponding. Therefore, careful cleaning of the silt fence geotextile with a light broom or brush may be appropriate,
- Remove sediment when bulges occur or when sediment accumulation reaches 20% of the fabric height,
- Remove sediment deposits as necessary (prior to 20% of fabric height) to continue to allow for adequate sediment storage and reduce pressure on the silt fence,
- Dispose of sediment to a secure area to ensure that it does not discharge to the receiving environment.

Controls are not to be modified without express approval from the SQEP and are not to be removed until stabilisation of at least 80% of the site has occurred.

e) Procedures of notifying of potential Environmental Incidents

An environmental incident is anything where the EMP has failed leading to any adverse environmental effects offsite (including sediment and nuisance effects associated with dust as well as spills of fuels and chemicals to ground or a water body).

If an incident occurs undertake immediate remedial actions to mitigate adverse environmental effects. Immediate response actions should not be delayed. Once the immediate risk from the Environmental Incident is alleviated,



the Environmental Representative shall investigate the cause of the breach and/or adverse environmental effects, then identify and implement corrective actions as soon as practicable. If a chemical or fuel spill occurs immediately use the spill kit on site to contain the spill. Collect any contaminated soil or water in containers (or on a truck depending on volume) onsite and dispose of to the Vitoria Flats contaminated soils landfill facility.

Call the ORC Compliance team and the pollution hotline immediately on 0800 800 033 for any incidents that cannot be brought under control, or for discharges of sediment, oil or chemicals to a waterbody, race or drain.

Take a lot of photos of the incident and immediate surrounds. Complete the form in Appendix 3 (or the ORCs Environmental Incident Report form available on their website) and notify QLDC within 12 hours of becoming aware of the incident, also send the form to the Compliance team at Otago Regional Council at pollution@orc.govt.nz

f) Procedures for managing storm events (wind and rain)

The site should always be suitably stabilised to limit erosion and sedimentation, any potential spills, discharges and deposition of waste from site. Also be aware there is an Emergency Response Procedure.



Environmental Induction Attendance Register Pro forma

Name	Date	Signature	Name	Date	Signature



APPENDIX 3: ENVIRONMENTAL INCIDENT REPORT FORM

Project Address:	QLDC Consent Number (if applicable): RM123456 BC123456
Brief Project Description:	

Instructions

Complete this form for all environmental incident that cause contaminants (including sediment) or environmental nuisance to leave the site. Please be succinct, stick to known facts and do not make assumptions.

Once completed submit to the Regulatory team at Queenstown Lakes District Council at RCMonitoring@qldc.govt.nz Call the Regulatory team immediately on [03 441 0499](tel:034410499) for any serious or ongoing incidents that cannot be brought under control.

Incident details

Date and Time	Date: XX/XX/XX Time: XX:XX am <input type="checkbox"/> pm <input type="checkbox"/>
Description Provide a brief and factual description of what happened during the incident, include relevant details such as: <ul style="list-style-type: none"> > The estimated distance to the nearest waterway (include storm water and dry courses) > The estimated distance to the nearest sensitive receiver > The activity being undertaken when the incident occurred Sketches/diagrams/photos may be reference and appended to this report to aid in the description of the incident	
EXACT location of the incident Include address, landmarks, features, nearest cross street, etc Maps and plans can be attached to the incident report if appropriate	
Quantity or volume of material escaped or causing incident (provide and estimate if quantity unknown)	
Who identified the incident?	<input type="checkbox"/> Contractor <input type="checkbox"/> Council <input type="checkbox"/> Community <input type="checkbox"/> 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 Otago Regional Council been notified? Yes No

Approvals:

Environmental Representative/Person making report

Name..... Signature.....

Organisation..... Date.....

Mobile phone number.....

Site Supervisor

Name..... Signature.....

Organisation..... Date.....

Mobile phone number.....



Appendix 4 - Complaints register

Name & Address of Complainant Contact Details	
Nature of the Complaint	
Location, Date and Time of the Alleged Event	
Weather Conditions at the time of Event Include wind direction and speed if noise/dust related	
Recommendations for Rectification	
Actions to be Taken	
Confirmation that the Complainant has been Informed of Rectification	
Confirmation the Matter has been Closed Out	Date: Name: Signature:



Appendix 5 – Weekly and Post Rain inspection

DATE;

ENVIRONMENTAL REPRESENTATIVE;

WEATHER OBSERVATIONS;

ITEM	OBSERVATIONS	CORRECTIVE ACTIONS NEEDED?	ACTION TAKEN AND WHEN
Clean water cut off drain		<p>Remove any accumulated sediment deposited in the diversion channel where there is a risk of overtopping due to a lack of freeboard</p> <p>Check invert and outlets to ensure that these remain free from scour and erosion. If Rip Rap is ineffective these points may require geotextile lining to avoid this effect</p> <p>Look for low spots, areas of water ponding, formation of tunnel gullies, sediment deposition and debris blockage</p> <p>Check for stabilisation cover and ensure full stabilisation cover remains where required</p> <p>Take particular care to protect against damage and reinstate the diversion if damaged</p>	
Silt fence		<p>Check for damage including rips, tears, bulges in the fabric, broken support wires, loose waratahs, overtopping, outflanking, undercutting, and leaking joints in the fabric. Make any necessary repairs as soon as identified.</p> <p>As the geotextile material becomes clogged with sediments, this will result in increased duration of ponding. Cleaning of the super silt fence geotextile with a light broom or brush may be appropriate.</p> <p>Remove sediment when bulges occur or when sediment accumulation reaches 20% of the fabric height.</p>	



		<p>Remove sediment deposits as necessary (prior to 20% of fabric height) to continue to allow for adequate sediment storage and reduce pressure on the silt fence.</p> <p>Dispose of sediment to a secure area to ensure that it does not discharge to the receiving environment.</p>	
<p>General Exposure</p> <p>Soil</p>		<p>Has soil exposure been minimised by staging the works to minimise the area of soil exposed at any one time and provide progressive stabilisation of disturbed surfaces. See Cut and Cover methodology.</p> <p>Effectively stabilise all permanent and temporary open drains immediately upon construction, including the base and the full width and length of the drainage channel.</p> <p>For the purpose of this section, an effectively stabilised surface is defined as one that, as a result of rainfall and stormwater runoff, does not erode, does not cause sedimentation and does not cause water contamination.</p>	



Appendix 6 – Accidental Discovery Protocol



HERITAGE NEW ZEALAND
POUHERE TAONGA

Heritage New Zealand Pouhere Taonga Archaeological Discovery Protocol

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 Maori sites this evidence may be in the form of bones, shells, charcoal, stones etc. In later sites of European/Chinese origin, artefacts such as bottle glass, crockery etc. may be found, or evidence of old foundations, wells, drains or similar structures. Burials/koiwi tangata may be found from any historic period.

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 Maori origin, the Site Manager shall notify the Heritage New Zealand Regional Archaeologist and the appropriate iwi groups or kaitiaki representative of the discovery and ensure site access to enable appropriate cultural procedures and tikanga 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 (koiwi tangata) are uncovered the Site Manager shall advise the Heritage New Zealand Regional Archaeologist, NZ Police and the appropriate iwi groups or kaitiaki representative and the above process under 4 shall apply. Remains are not to be moved until such time as iwi and Heritage New Zealand have responded.
6. Works affecting the archaeological site and any human remains (koiwi tangata) shall not resume until Heritage New Zealand 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 will determine 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