Mt Cass Wind Farm
Construction Management Plan

Revision 5 – 02 May 2023

Revision History		
Version	**Status**	**Issue Date**
Rev 1	Draft for Consultation	Dec 2022
Rev 2	MCD Updates post SQIP and MCWF Review	16/12/22
Rev 3	Updates to dates due to changes in programme	23/02/23
Rev 4	Post CLG Review and submission to HDC	22/03/23
Rev 5	Amend dates and laydown yard	02/05/23

Approvals					
Revision	**Action**	**Name**	**Position**	**Date**	**Signature**
Rev 4	Originator	David Kidd	MCD Construction Manager	22/03/23	
Rev 5	Reviewed By	Mike Carstens	Civil Project Engineer	2/05/23	
Rev 5	Approved By	Greg Gummer	Project Director	2/05/23	

Cross-Reference Table to Conditions of Consent

For ease of review a matrix of the HDC consent conditions is provided in Appendix A of this management plan as a means of cross-referencing the conditions of consent with this plan and its sub plans.

In the individual sub-plans, there is a more detailed table which states how each plan meets the specific conditions.

Terms & Definitions

TERM	DEFINITION
Accidental Discovery Protocol (ADP)	The ADP shall set out the steps to take should any prehistoric (Māori) or historic archaeological site be found as a result of any earthmoving or ground modification that occurs during the construction and operation of the wind farm at any time.
Boulder Field	Boulder field means land in which the area of unconsolidated bare boulders (> 200 mm diam.) exceeds the area covered by any one class of plant growth-form
Civil Balance of Plant (cBoP) Contractor	Company engaged by MCWFL to design and build the civil scope of the project. Namely McConnell Dowell Constructors Ltd
Community Liaison Group (CLG)	A group offered to be established by way of public notice. Consisting of 1x East ward representative of property owners 1x South ward representative of property owners 1x Representative of Mt Cass Rd residence 1x Representative from the consent holder 1x Observer from the Hurunui District Council
Consent Holder	Mt Cass Wind Farm Limited
Construction Management Plan (CMP)	This document
CMP Review Panel	A Review Panel formed from a nominated member from each of the contracting entities, MCWFL and their relevant technical experts who are tasked with carrying out an annual review of the CMP
Construction Laydown Yard	A laydown area at the intersection of Symonds Rd and Mt Cass Rd specifically constructed for SGRE to handle the WTG units as they come to site.
eBoP	Electrical Ballance of Plant – Company engaged by MCWFL to design and build the electrical scope of the project. Namely ElectroNet Services Ltd
ECan	Environment Canterbury (Canterbury Regional Council)
ESCP	Erosion Sediment Control Plan
Exposed Limestone Pavement	Exposed limestone pavement means those areas, in situ or otherwise, that consist of a continuous, relatively flat or moderately inclined surface with an organised system of open sub-vertical joints which fully penetrate the surface limestone bedding as identified on Golder

	Associates plans CG181.3, CG182.3, dated 27 May 2011 attached as Appendix 2.
HDC	Hurunui District Council
Independent Suitably Qualified Person (SQIP)	A company agreed between HDC and MCWFL who is engaged to review the CMP and certify its compliance against the resource consent conditions. Namely Stantec Ltd.
Inspection Test Plan (ITP)	Contractor produced check list demonstrating how compliance with the specification will be met to ensure quality control
Job Safety and Environmental Analysis (JSEA)	A risk assessed method statement which aims to identify and mitigate environmental and safety hazards.
Landscape Panel	A panel to provide expert guidance to the project on the implementation of the landscape conditions in the resource consent. The panel is formed of 1x MCWFL and 1x HDC Appointed Land Scape Architect.
Micro Siting	The process of relocating the turbine within the limits of the consent conditions to optimise site conditions for the turbine.
Mt Cass Wind Farm	The Project
Mt Cass Wind Farm Limited	The Consent Holder and Principal
Mt Cass Rd Upgrade	A scope of work yet to be designed and procured that involves the upgrade of the Mt Cass Rd between Denis O'Rourke Drive and the access to the Wind Farm.
Permanent Stockpile	A stockpile (Disposal Site) location which will receive fill from the project and is to be left after the project. These must meet RC requirements for design, contouring and rehabilitation.
Port of Entry (POE)	The port that imported goods first enter New Zealand
Regulator	Relevant council to the consent
Safe Work Method Statement (SWMS)	A risk assessed method statement which aims to identify and mitigate environmental and safety hazards.
Siemens Gamesa Renewable Energy (SGRE)	S&I contractor supply and installing the wind turbine generators.
Site Cultural Sensitivity Protocol (SCSP)	Protocols and process for dealing in a culturally safe manner with all sites identified under condition [126] as being of potential cultural concern or significance to Waitaha.
Site Construction Camp	The main construction camp built at the base of the wind farm access track.

Site Traffic Management Supervisor (STMS)	Is the supervisor responsible for managing all temporary traffic management aspects of a roadworks site. They ensure effective protection for all road workers and road users at and near the site, correct direction of the traffic through the site as well as compliance with all necessary standards, and responsibility for traffic-related safety at all times.
Stantec Ltd	The Suitably Qualified Independent Person
Suitably Qualified Independent Person (SQIP)	An individual who is suitably qualified to review and certify that this CMP meets the requirements of the resource consents. They are to be approved by HDC and engaged by MCWFL. – Namely Tim Morrison from Stantec Ltd
S & I Contractor	The supply and install contractor – Namely Siemens Gamesa Renewable Energy (SGRE)
Temporary Speed Limit (TSL)	A speed limit implemented under a traffic management plan to temporarily reduce the speed limit from the legal posted limit.
Temporary Stockpile	A stockpile that is used to facilitate construction but not left on site on completion of the project. These are used for short durations and are stabilised using permanent means. I.e., an aggregate stockpile.
Traffic Management Diagram (TMD)	A site-specific traffic management layout drawing
Traffic Management Plan (TMP)	is developed by a qualified person and describes all the co-ordinated measures that detail how a safe environment will be created for all road users while work or activity takes place on the roading corridor (road, footpath, or berm).
Work Pack	A document compiled by the contractor for all construction tasks. Comprises of a method statement, JSEA / SWMS Inspection test plan, permits to work and SOPs and demonstrates how the construction will comply with the resource consent, law, specification, industry best practice company and project procedures.
WTG	Wind Turbine Generator

1 Introduction

1.1 Purpose

This Construction Management Plan (CMP) has been prepared to

- Avoid environmental harm
- Mandate how compliance will be achieved
- Meet the requirements of the resource consents
- Meet the requirements of the overarching Mt Cass Wind Farm Environmental Management Plan

Its purpose is to communicate the construction management procedures and construction methods that are to be implemented throughout the course of the Mt Cass Wind Farm Project by each of its contractors and how the project will meet the conditions of the resource consents.

1.2 Objectives

This Construction Management plan has been prepared to meet the following objectives.

a. To minimise the overall area of disturbance (by cuts, fills and placement of cover) of karst limestone features and indigenous vegetation, but in any event, to ensure compliance with the maximum levels of indigenous shrubland and forest clearance and disturbance of limestone pavement and boulder field set out in RC070250 Condition 13 and CRC214150 Condition 2.
b. Avoid disturbance of vegetation and limestone features within the exclusion zones as set out in RC070250 condition 6 and CRC214150 Condition 3.
c. To minimise sediment generation and sediment-laden runoff in accordance with RC070250 condition 37.
d. To maintain existing surface and subsurface drainage patterns and pathways.
e. To ensure that appropriate monitoring and reporting of all activities are undertaken in accordance with these conditions.
f. To ensure that the earthworks and spoil disposal areas are contoured so that, to the greatest extent practicable, the finished landform will blend with the surrounding landscape so as not to be visually dominant from any public viewing point (excluding unformed legal roads).
g. To ensure that the earthworks are undertaken in a manner which provides for final surfaces which are suitable for rehabilitation and/or recolonisation by native vegetation to achieve vegetative cover that is effective at minimising sediment run-off.
h. To ensure that only those areas identified in the Plan CRC214150B and CRC214150C dated April 2019 plans referred to in conditions 3, 4 and 5 are used as spoil disposal areas.
i. To ensure matters relating to the extent and timing of construction traffic and the traffic management provisions to be put in place during this time, achieve a safe and efficient road network.
j. To ensure that CRC214150 Condition 21 relating to visual effects mitigation can be met.
k. To identify threatened indigenous flora within the construction zone and provide for their safe relocation as required under the Environmental Management Plan in Consent CRC214150 Condition 19.
l. To identify the Waitaha gecko (Canterbury gecko) and other lizard species within the construction zone and provide for their safe relocation as required by the Environmental Management Plan in Consent CRC214150 Condition 19 and Consent RC070250 condition 79.
m. To identify snails and other snail species within the construction zone and provide for their safe relocation as required by consent CRC214150 Condition 28
n. Minimise the potential for disruption to any active New Zealand falcon nest identified within 200 m of any construction or earthwork area, and Consent RC070250 condition 73.
o. To minimise the introduction and spread of weeds.
p. Control construction noise.

1.3 Plan Overview

The CMP applies to all works up to and including the completion of commissioning and rehabilitation of construction activities.

This CMP is a requirement of the HDC Land Use consent RC070250 and the Canterbury Regional Council (ECan) Consent CRC214150.

These consents are the overarching regulatory documents that form this CMP. MCWFL has developed an Environmental Management Plan (EMP) which provides the overall governance and strategy for the lifecycle of the project.

The EMP sets out construction ecology risks and associated management processes to mitigate the identified project risks. During construction, each contractor engaged by MCWFL will be responsible for ensuring that this plan is correctly implemented and will review all documentation relating to this plan before it is finalised and issued.

The overhead transmission lines from the substation to the electrical grid are covered under different resource consents and do not form part of the scope of work covered by this CMP or its subplans.

1.4 Document Interface

The CMP is governed by the resource consents and the MCWFL EMP, which are the overarching documents.

This CMP sets out how the construction will be managed and consent conditions met and is supplemented by Sub-Management plans which detail how specific risks are managed.

The individual contractors engaged by MCWFL will require their own individual management plans under their internal policies. These plans will be written to ensure that they meet the requirements of this CMP which has precedence.

The flow chart in

Table *1* below shows the hierarchy of documents and how they interface with each other.

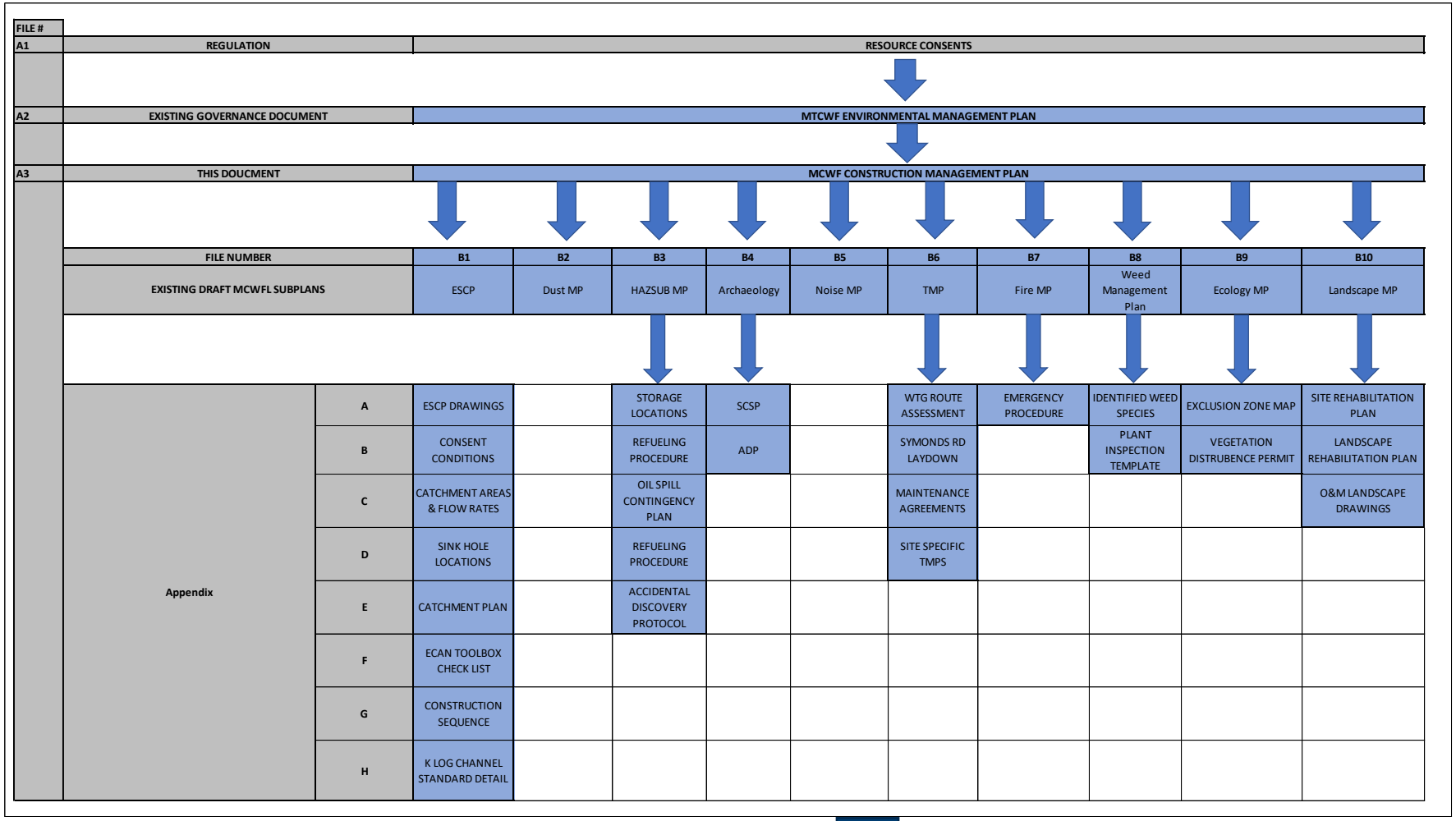


Table 1 CMP Document Hierarchy

1.5 Sub-Management Plans

The sub-management plans in Table 2 have been developed and form part of the CMP.

Plan Number	Title	Revision
B1	Erosion Sediment Control Plan (ESCP)	5
B2	Dust Management Plan (DMP)	4
B3	Hazardous Substance Management Plan (HSMP)	4
B4	Archaeology Management Plan (AMP)	4
B5	Noise Management Plan (NMP)	4
B6	Traffic Management Plan (TMP)	5
B7	Fire Management Plan (FMP)	10
B8	Weed Management Plan (WMP)	4
B9	Ecology Management Plan (EcoMP)	4
B10	Landscape Management Plan (LMP)	4

Table 2 Sub-Management Plans

1.6 Relevant Consent Holder Documents

Table 3 provides a list of the relevant overarching project documents.

Title	Revision
Mt Cass Wind Farm Environmental Management Plan	Rev 12 (06/12/22)
Mt Cass Wind Farm Health and Safety Management Plan	Rev G (16/08/22)
Wildlife Act Authority	98153-FAU (29/11/22)

Table 3 Relevant Overarching Project Documents

1.7 Relevant Consents

Table 4 provides a list of the consents for the construction of the Mt Cass Windfarm.

Number	Title	Regulator
CRC214150	Land for Earthworks-Construction	ECan
CRC214152	Construction Stormwater Discharge to Land	ECan
CRC214153	Dust Discharge solids materials handling	ECan
CRC214154	Dust Discharge from outdoor material storage	ECan
CRC214156	Water Discharge - Construction	ECan
RC070250	Land Use Consent	HDC

Table 4 MCWF ECan and HDC Consents

1.8 Relevant Consent Conditions

Appendix C of the Construction Management Plan includes a matrix of all consent conditions that are included in the Construction Management Plan and Subplans. Table 5 below shows the specific conditions that pertain this plan:

Consent Conditions	Control
31). The objective of the Construction Management Plan shall be to set out the practices and procedures to be adopted to ensure compliance with consent conditions and to meet the following objectives:	
a. To minimise the overall area of disturbance (by cuts, fills and placement of cover) of karst limestone features and indigenous vegetation, but in any event to ensure compliance with the maximum levels of indigenous shrubland and forest clearance and disturbance of limestone pavement and boulder field set out in condition [13];	Refer sub-plans B9 – EcoMP and B10 – LMP
b. Avoid disturbance of vegetation and limestone features within the exclusion zone as set out in condition [6];	Refer sub-plans B9 – EcoMP and B10 – LMP
c. To minimise sediment generation and sediment laden runoff in accordance with condition [37];	Refer sub-plan B1 - ESCP
d. To maintain existing surface and subsurface drainage patterns and pathways;	Refer sub-plan B1 - ESCP
e. To ensure that appropriate monitoring and reporting of all activities is undertaken in accordance with these conditions;	Refer to Section 9 of this CMP
f. To ensure that the earthworks and spoil disposal areas are contoured so that, to the greatest extent practicable, the finished landform will blend with the surrounding landscape so as not to be visually dominant from any public viewing point (excluding unformed legal roads);	Refer sub-plans B10 – LMP
g. To ensure that, the earthworks are undertaken in a manner which provides for final surfaces which are suitable for rehabilitation and/or recolonisation by native vegetation;	Refer sub-plans B10 – LMP
h. To ensure that only those areas identified in the Golder Associates plans referred to in conditions [3] and [4] and MainPower Plans referred to in condition [5] are used as spoil disposal areas;	Refer sub-plans B1 ESCP and B10 LMP
i. To ensure matters relating to the extent and timing of construction traffic, and the traffic management provisions to be put in place during this time, achieve a safe and efficient road network;	Refer sub-plan B6 - TMP
j. To ensure that conditions of this consent relating to visual effects mitigation can be met;	Refer sub-plans B10 – LMP
k. To identify threatened indigenous flora within the construction zone and provide for their relocation as required by condition [32.n];	Refer to EMP
l. To identify Canterbury gecko and other lizard species within the construction zone and provide for their relocation as required by condition [79];	Refer sub-plan B9 EcoMP (also MCWFL EMP)

m. Minimise potential for disruption to any active New Zealand falcon nest identified within 200 m of any construction or earthwork area; and	Refer sub-plan B9 EcoMP (also MCWFL EMP)
n. To minimise the introduction and spread of weeds.	Refer subplan B8 - WMP
32) The Construction Management Plan shall include, but not be limited to:	
a. The methods and techniques to achieve the above (condition 31) objectives.	Consent matrix in Appendix C: outlines where each consent condition is controlled, and how it is controlled.
b. Assigning roles and responsibilities, including appointment of a representative to be the primary contact person in regard to construction matters relating to this consent	Refer to Section 3 Roles and Responsibilities of this CMP
c. Details of a training programme for machinery operators working on the site who will be involved in indigenous vegetation or limestone pavement or boulder field disturbance. The training programme will include, but not be limited to, education on using least impact techniques when disturbing or clearing limestone or indigenous vegetation.	Refer to section 7 of this CMP
d. Limits of disturbance to indigenous vegetation and karst landforms in accordance with condition [13].	Refer sub-plan B9 Ecology And Pre-construction Management Plan
e. Location of soil stockpiles and spoil disposal areas.	Refer sub-plans B1 – ESCP and 12 - LMP
f. Construction staging and sequencing over the entire site.	Refer to section 5 Construction Method of this CMP
g. A description of the sources of noise and the methods to be used to meet condition [131].	Refer sub-plan B5 – NMP
h. Management of construction traffic as provided for in condition [63].	Refer sub-plan B6 – TMP
i. Procedures for earthworks, erosion and sediment control, stabilisation of the site (including the removal or stabilisation of any unstable boulders) and revegetation of existing vegetation sites with locally eco-sourced indigenous species and non-invasive, low stature grasses such as perennial ryegrass (Lolium perenne) and annual poa (Poa annua) grass species only. Aggressive exotic grasses such as browntop (Agrostis caprillaris), cocksfoot (Dactylis glomerata) and brome (Bromus spp.) shall not be used.	Refer sub-plans B1 – ESCP and B10 – LMP Also refer to EMP
j. Contouring of all spoil disposal sites to visually integrate into the natural landform.	Refer sub-plan B10 – LMP

k. Procedures for management, control and maintenance of runoff processes and patterns	Refer sub-plan B1 – ESCP
l. Procedures for the management of dust.	Refer sub-plan B2- DMP
m. Procedures for the management of weeds.	Refer sub-plan B9 – WMP
n. Methods for the relocation of threatened indigenous flora (as defined by de Lange et al (2009)) identified within the construction zone, and where practicable, At-Risk indigenous flora (defined be de Lange et al (2009)) identified within the construction zone.	Refer sub-plan B9 EcoMP (also EMP)
o. Methods for location and relocation of lizards as required by condition [79].	Refer sub-plan B9 EcoMP (also EMP)
p. Procedures for management of fire risk and for fire suppression.	Refer sub-plan B7 – FMP
q. Adoption, if appropriate, of the principles identified in the Ministry for the Environment publication "A Cultural Health Index for Streams and Waterways, June 2003, Technical Paper 75".	Not considered applicable to this site as there are no permanent waterways.
r. Spill contingency measures and procedures for the management of hazardous substances.	Refer sub-plan B3 – HSMP
s. Procedures for rehabilitation of the areas directly affected by the construction and roading activities and the ongoing maintenance of the rehabilitation work.	Refer sub-plan B10 – LMP
t. Monitoring, record-keeping and reporting requirements.	See reporting and monitoring section of this plan and all sub-plans.
u. Procedures for minimising the visual effect of any removal or stabilisation of unstable boulders for safety reasons during construction and operation.	Refer sub-plan B10 – LMP
v. Procedures to ensure compliance with conditions [45] and [46] for the treatment of identified areas of limestone pavement.	Refer sub-plan B10 – LMP

Table 5 MCWF Consent Conditions Applicable to the CMP.

2 CMP Review and Approval

2.1 Mt Cass Approvals

This CMP is drafted in collaboration between Mt Cass Windfarm Limited (MCWFL) and their contractors. The approval process is demonstrated in the flow chart in Figure 1 below.

On completion of the draft the CMP is to be issued to MCWFL for review as the consent holder.

Stantec are approved as the Suitably Qualified Independent Person (SQIP) to certify that the CMP meets the requirements of Consent CRC214150 condition 8 and 9 and the CMP requirements of Consent RC070250.

The CLG have also been given the opportunity to provide comment at the initial draft and final review stage.

As required by the resource consent, MCWFL will issue the CMP to the Regulator for review prior to commencing with construction.

Figure 1 Approval Flow Chart

2.2 Approval Timeline

The CMP is to be issued to the Regulator 30 working days prior to construction starting on site. The target start date for construction is the 31st of October 2023.

To achieve this the following milestones in Table 6 must be met.

Date	Milestone	Responsible Entity
2/12/22	Issue first drafts of CMP to MCWFL	cBoP eBoP S&I
9/12/22	Issue draft review comments	MCWFL
16/12/22-28/02/23	Independent review comments	Stantec
23/12/22 to 3/02/23	Amendments made by MCD	cBoP eBoP S&I
6/03/23 to 17/03/23	Community Liaison Group review	MCWFL

20/03/23 to 29/05/23	Final Amendment post CLG Review	MCD
30/5/23	Issue CMP to Regulator	MCWFL
28/06/23	ECan review period completed in 20 Working days	ECan
12/07/23	HDC review period completed 30 Working days	HDC
16/10/23 (TBC)	Provide 10 working Days' notice to Iwi of earthworks activities	MCWL
24/10/23 (TBC)	Provide 5 working day notice of construction starting	MCD/ MCWFL
31/10/23 (TBC)	Construction commences on site	cBoP

Table 6 Proposed CMP Timeline

2.3 Lodgement of the CMP

Copies of the CMP shall be lodged in the Hurunui Memorial Library in Amberley and the Christchurch Public Library so that there is public access to them. In addition, copies shall be publicly available on the Consent Holder's website https://www.mtcasswindfarm.co.nz/

2.4 Amendments

The CMP is a live document and will be reviewed and updated throughout the duration of the project.

The consent holder may make any reasonable amendments to the CMP (including any sub-management plans which are prepared as part of the CMP). Any changes to the management plans shall remain consistent with the objectives of the CMP and be certified by an independent, suitably qualified certifier(s).

The Consent Holder shall provide any amended plan to the Hurunui District Council and ECan (Marked Attention Regional Leader, monitoring and compliance) for certification that it will achieve compliance with the relevant consent conditions.

The flow chart in Figure 2 below demonstrates the amendment process.

Figure 2 CMP Amendment Process.

All activities shall be undertaken per the latest versions of management plans.

2.5 Annual Review

This document is to be formally reviewed every 12 months throughout construction (including rehabilitation) as required in by Consent RC070250 Condition 26 or if it is found that the management practices are not achieving the objectives of the Management Plan, which are outlined in section 1.2.

A Review Panel will be formed from a nominated member from each of the contracting entities, MCWFL and their relevant technical experts.

The review will assess whether management practices are resulting in compliance with the conditions of the relevant consents, and whether the objectives of the management plans are being met through the actions and methods undertaken.

The Consent Holder shall amend the plans where it is necessary to better achieve the objectives of the management plans and the conditions of this consent. The Consent Holder shall provide any amended plan to the Hurunui District Council and ECan for certification that it will achieve compliance with the relevant consent conditions. The management plans shall not be amended in any way that contravenes the objectives set out for the respective plans.

The flow chart in Figure 3 below demonstrates the annual review process.

Figure 3 – CMP Annual Review Process.

3 Roles and Responsibilities

3.1 Project Structure

Mt Cass Windfarm Limited are the principal consent holder and have chosen a multi-contract model for the construction of the windfarm. This contract model sees the principal engaging separate contractors to design and construct their relevant scope of works working in collaboration with each other while the principal is responsible for the overall project management of the project. This differs from a traditional construction project where a head contractor is engaged to manage all of the project's scope and who engages specialist subcontractors.

This is important to understand in relation to the presentation of the CMP as it requires a collaboration of different companies to provide relevant information and agree on the best project construction methods and procedures.

The Mt Cass Wind Farm Project organisational structure is shown in Figure 4 below

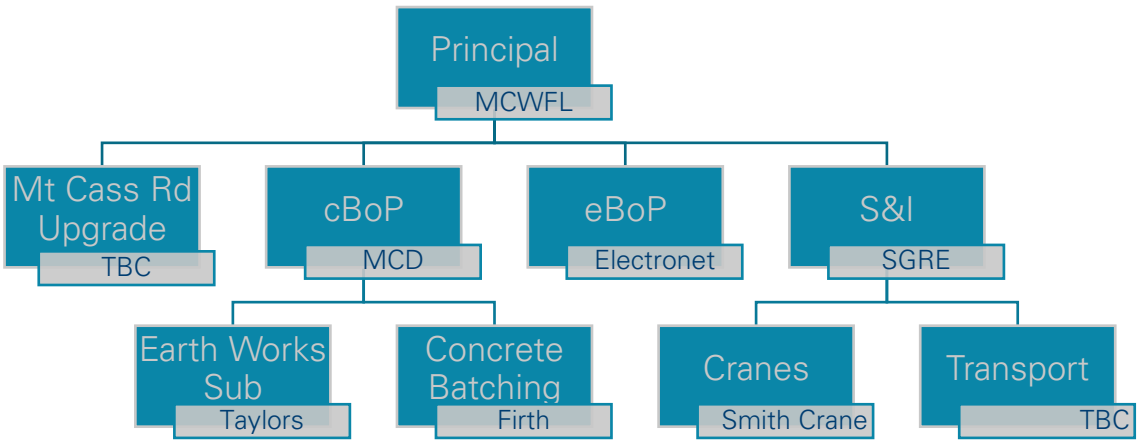


Figure 4 Mt Cass Wind Farm Project Structure

3.2 Key Project Contacts List

The project key contacts are list in Table 7 below.

Consent Holder – Mt Cass Windfarm Ltd				
Role	**Company**	**Name**	**Phone**	**Email**
Project Director (Primary Contact)	MCWFL	Greg Gummer	021 738 995	greg.gummer@mainpower.co.nz
Construction Manager	MCWFL	TBC		
Project Engineer (Civils) Secondary Contact	MCWFL	Michael Carstens	027 247 1713	michael.carstens@mainpower.co.nz
Project Engineer (Electrical) Secondary Contact	MCWFL	Neil Wiggins	021 027 33133	neil.wiggins@mainpower.co.nz
Senior Project Coordinator	MCWFL	Lisa Yuyi	021 779 380	lisa.yuyi@mainpower.co.nz
Ecology	RMA Ecology	Graham Ussher	027 272 7930	ahurley@geotech.co.nz
Herpetofauna (Lizard) Management	RMA Ecology	Graham Ussher	027 272 7930	gkessels@bluewattle.co.nz
Avifauna (Bird) Management	Kessels & Associates (T/A Bluewattle Ecology)	Gerry Kessels	027 286 8449	gkessels@bluewattle.co.nz
Plant Management	RMA Ecology	Tony Payne	027 807 9018	tony.payne@rmaecology.co.nz

Weed Management	Wai-Ora	Lauren Scott	027480 8007	lauren@wai-ora.nz
Land Scape Panel MCWF Appointed	Glasson Huxtable	Chris Glasson	021 571 669	chris@ghla.co.nz
Landscape Panel HDC Appointed	Rough & Milne	Nikki Smetham	027 532 6676	nikki@roughandmilne.co.nz
Animal Pest Management	Pest Control Solutions	Fraser Maddigan	027 525 3619	Bradley855@gmail.com
Other advisors	Geotech Consulting Ltd	Andrew Hurley	027 479 1516	ahurley@geotech.co.nz

cBoP – McConnell Dowell				
Role	**Company**	**Name**	**Phone**	**Email**
Project Manager	MCD	Phil Owen	021638726	Phil.owen@mcdgroup.com
Construction Manager	MCD	David Kidd	0277039803	David.kidd@mcdgroup.com
Site Manager	MCD	TBC		
HSEQ Manager	MCD	Clint Hill	0277028309	Clint.hill@mcdgroup.com
Project Environmental Advisor	MCD	Caitlin Burns	021759938	caitlin.burns@mcdgroup.com
Foreman (Environmental)	MCD	TBC		
Earthworks Manager	Taylor Contracting	Shannon Proctor	021501894	shannon@taycon.co.nz

Batching Plant Manager	Firth	Mark Cresswell	0274776958	mark.cresswell@firth.co.nz

eBoP – Electronet				
Role	**Company**	**Name**	**Phone**	**Email**
Project Manager	ElectroNet	Matt Daffin	0275869102	MDaffin@electronet.co.nz
Environmental Advisor	ElectroNet	Sandy Keown	0272354021	sandyk@electronet.co.nz

S&I Contractor – Siemens Gamesa Renewable Energy				
Role	**Company**	**Name**	**Phone**	**Email**
Project Manager	SGRE	Akshar Sheth	TBC	aksar.sheth@siemensgamesa.com
Project Director	SGRE	Sumblli Rohit	TBC	rohit.sumbli@siemensgamesa.com

Table 7 Project Key Contact Lists

3.3 Responsibilities

Table 8 below defines the key responsibilities for the project.

Role	Responsibility
MCWFL Project Director	• Has ultimate responsibility for compliance with the specification and resource consent conditions. • Reports to MCWF senior management on environmental compliance
MCWFL Construction Manager (Primary Contact)	• Has ultimate responsibility for construction activities on and ensuring implementation of this CMP • Reports to the Project Director. • Is the primary point of contact as required under the resource consent conditions
MCWFL Civil Project Engineer	• Is responsible for compliance with the specification and resource consent conditions for the civil scope of work • Reports to the Construction Manager.
MCWFL Electrical Project Engineer	• Is responsible for compliance with the specification and resource consent conditions for the electrical scope of work • Reports to the Construction Manager.
MCWFL Consultant Advisors	• Provide input to MCWF Environmental Manager regarding aspects of the CMP • Participate in monitoring and audits of the contractor's compliance with the CMP • Provide ongoing advice to address environmental issues raised during construction.
MCWFL Archaeologist	Available to advise the project team on any discovery.
MCWFL Environmental Advisor	• Develops, implements, and reviews environmental management systems and plans • Provides leadership to ensure all staff comply with environmental management systems • Co-ordinates environmental management interfaces with external agencies and stakeholders • Notifies the consent authorities of any non-compliance • Responsible for reporting major defects and non-compliances and arranging appropriate corrective actions • Trains staff in environmental objectives and procedures

Role	Responsibility
	• Primary contact for environmental complaints and enquiries.
ECan Field Officer	• Undertakes compliance inspections as necessary • Attends early meeting to contribute to development of CMP • Attends environmental review meetings.
HDC Environmental Services Manager	• Reviews submitted information as required in the resource consent.
Community Liaison Group	• Maintain effective working relationships and mutual trust between the local community and MCWF • To provide a forum for communication between the local community, MCWF, the contractors and the Consent Authority • Oversee a community complaints procedure • Respond to matters which may arise.
Contractors Project Manager or Nominated Environmental Representative	• Overall environmental performance of their scope of works • Ensure their scope of works achieves legislative compliance • Provide leadership in the development of this plan and co-ordinate with other contractors • Nominate key personnel, assigning environmental responsibilities and allocating sufficient resources to achieve implementation of this plan • Ensure all personnel are familiar with and implement all relevant environmental controls as required • Monitor environmental performance to ensure compliance and continued improvement • Report any environmental incidents to the MCWFL Construction Manager.
Contractors Environmental Advisor	• Support the Contractors Project Manager/ Environmental Manager/ HSE Manager to ensure that all key environmental aspects and associated impacts are incorporated into the CMP and Contractors EMP, and that suitable control measures are proposed to minimise the Project's environmental impact. • Ensure all staff and contractors engaged to work on/ at the Project are appropriately inducted and trained in environmental issues and controls relevant to the Project. • Ensure monitoring programs which assess the performance of the CMP, and any associated documents are implemented. • Report any environmental incidents to the Contractors Project Manager / Environmental Manager/ HSE Manager.

Role	Responsibility
	• Investigate and report incidents and non-conformance and ensure corrective and preventive action is taken and is effective.
Contractors Design Manager	• Provide effective environmental leadership • Ensure designs are undertaken in accordance with the requirements of the scope of works, technical requirements, relevant standards and this plan • Ensure design has minimal environmental impact • Ensure an ESCP is designed in conjunction with the permanent works design • Ensure processes and resources are in place to adhere to environmental and sustainability obligations where they affect design or are affected by design • Participate in incident and non-conformance report investigations and ensure that corrective and preventative action proposed is implemented effectively.
Contractors Site Supervisor	• Ensures environmental, erosion and sediment control works are implemented and maintained • Leads the emergency response crew with advice from the Environmental Manager • Reviews and authorizes the closure of Site Access Points to reduce the risk of • dirt on roads • Reviews the need to use a water cart to control dust.
Contractors Environmental Site Team	• A crew / small team responsible for implementing specialist environmental control measures e.g. erosion and sediment retention ponds and decanting earth bunds, topsoil bunding, silt fences, pond maintenance etc
Construction Plant Operators	• To ensure that weed control measures are implemented • To ensure that indigenous vegetation disturbance is limited • To ensure that limestone pavements are protected • To ensure that no work is carried out in exclusion zones • To ensure that site refuelling procedures are followed • To ensure that ESC is in place prior to work • To follow the permit to work systems • Responsible for reporting incidents and other problems to senior staff.

Role	Responsibility
Site Personnel	• Responsible for reporting incidents, defects, and other problem areas to senior site staff as they arise on site. Standard forms will be used for all incident reporting. • Carry out routine maintenance and emergency work when directed. • Care for all environmental works. • Ensure the site is kept tidy and litter is placed in bins. • Act in an environmentally responsible manner always to reflect the contractor's commitment to environmentally responsible environmental practices

Table 8 Project Roles and Responsibilities

4 PROJECT OVERVIEW

4.1 Project Summary

The Mt Cass Windfarm (MCWF) Project aims to design and construct 22 Siemens Wind Turbine Generators (WTGs) along the 7.5km ridge between Mt Cass and Oldham Peak including associated roads, drainage, hardstands, substation, and O&M buildings. In terms of the resource consent the R90 turbine layout will be used.

The project will be the largest wind farm on the South Island with a maximum capacity output of 94MW.

This YouTube Link provides a computer-generated fly over of the project.

4.2 Location

The Mt Cass Wind Farm (MCWF) project is located east of Waipara in North Canterbury and is 15km northeast of Amberley, New Zealand. The site access is via Mt Cass Road.

The location map in Figure 5 provides the sites location in relationship to Christchurch.

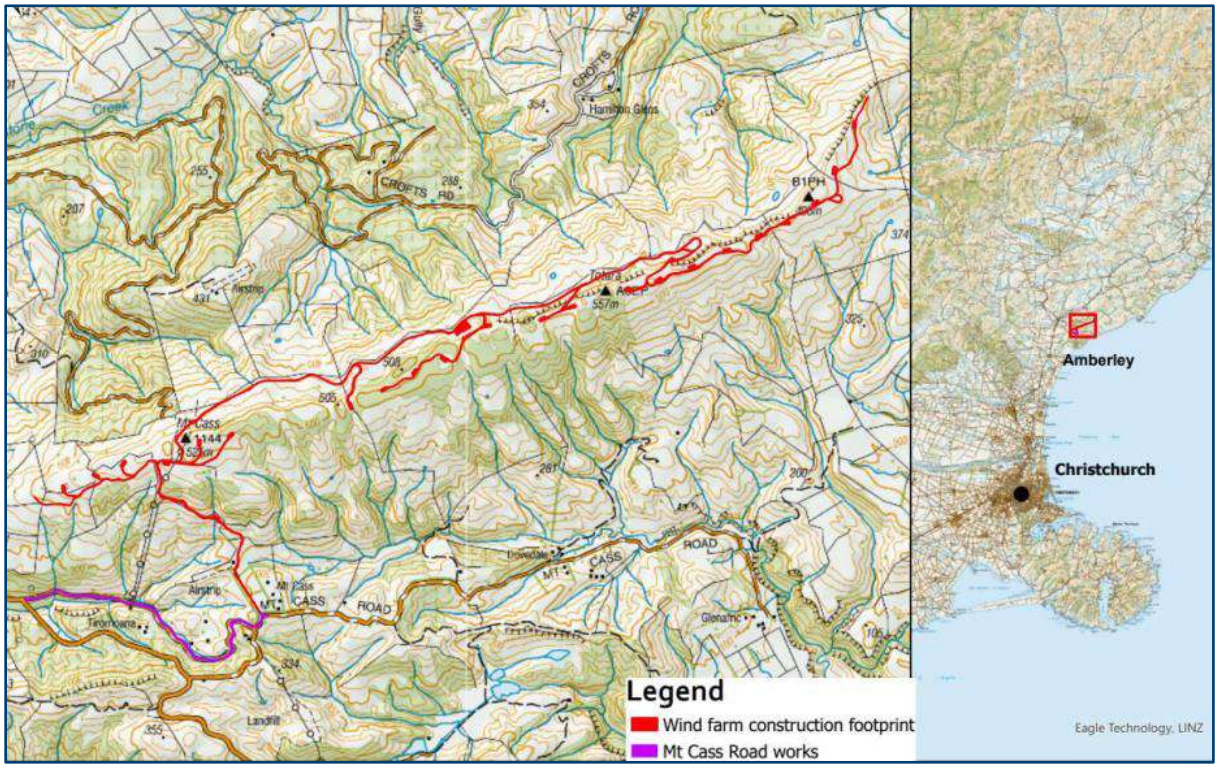


Figure 5 – Mt Cass Location Map.

4.3 Site Description

The site is within the territorial authority jurisdiction of Hurunui District Council (HDC). The Site includes the Mt Cass Conservation Management Area which is outlined in Figure 6 below – This is a significant area of indigenous vegetation. The limestone-associated vegetation types and habitats present are regarded as regionally rare and underrepresented within the current protected area network in Canterbury.

This unique location requires MCWFL to undertake a programme of conservation protection and restoration, which adds significant management responsibility throughout the construction phase of the project.

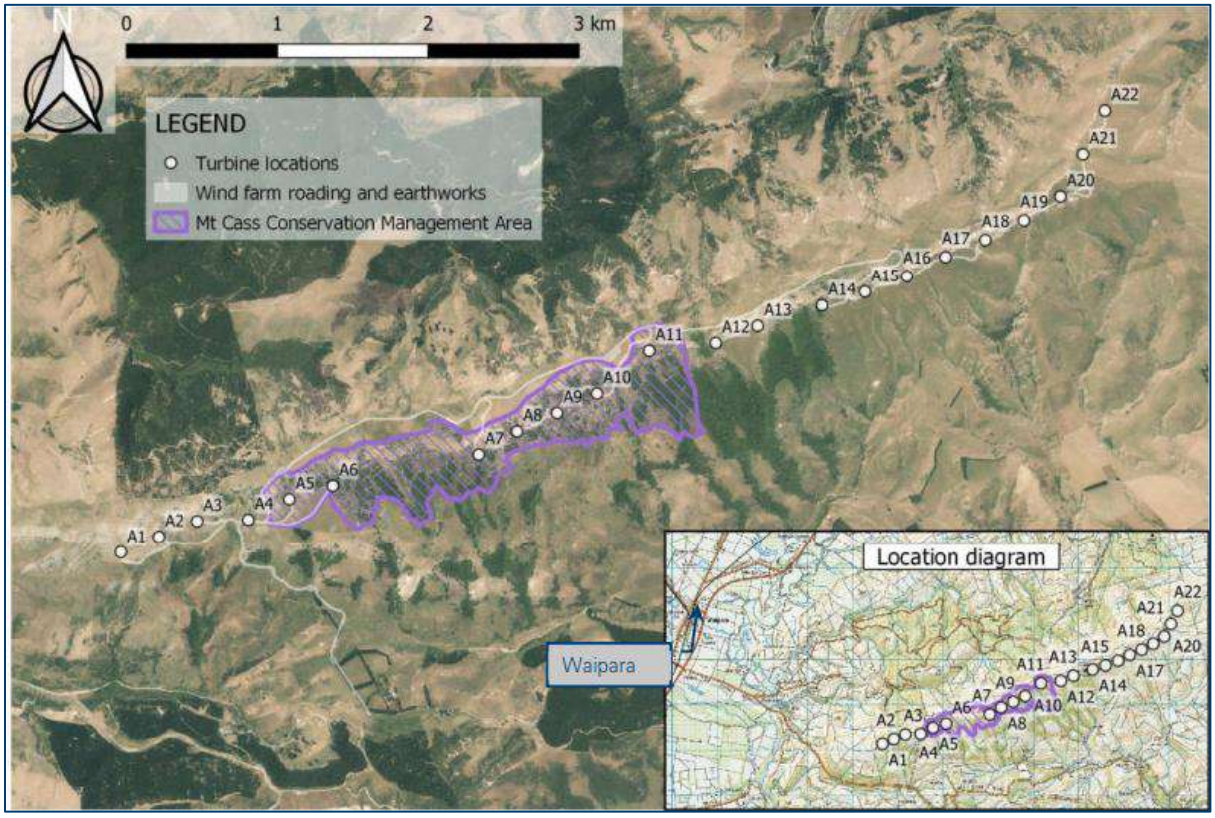


Figure 6 Site map with Mt Cass CMA shown in purple

4.4 Project Scope

The individual contractor's scope covered by this CMP is defined in Table 9 and shows which contractor is responsible for which aspects of the project.

cBoP Contractor	eBoP Contractor	S&I Contractor	Unallocated
Erosion and Sediment Control	Trenching	Tensioning of Hold Down Bolts	Mt Cass Rd Upgrade
Site Laydown	Underground cables	Supply and Installation of WTG	O&M Building
Site Construction Camp	Substation		
Earthworks			
Access Road Construction			
Storm Water			
WTG Crane Pads			
O&M Building Pads			
Substation Pad			
Batching Plant			
WTG Foundation Construction			
Installing Hold Down Bolts			
Grouting of Hold Down Bolts			
Fencing			
Remediation			

Table 9 Mt Cass Wind Farm Contractor Scope

4.5 Stake Holders

4.5.1 Key Stake Holders

The MCWF project takes its obligations in relation to understanding the needs and expectations of interested parties seriously. The parties in Table 10 on the next page are identified as having a specific interest in the project.

Stakeholder	Interests
HDC Councillors	Political, positive benefits
HDC consent compliance team	Compliance with consent conditions, minimising the actual and potential effects on the environment
HDC Road Corridor team	Works on Mt Cass Road, compliance with TMP and temporary traffic management controls
Iwi (Te Ngāi Tūāhuriri Rūnanga and Waitaha ki Waitaha)	Potential areas of cultural significance, water quality, indigenous flora and fauna
Heritage New Zealand Pouhere Taonga	Potential archaeological site or materials Development of site-specific Accidental Discovery Protocol
Transpower	Connections to transmission lines
Waka Kotahi New Zealand Transport Agency	Transportation of Project components using State Highway 1, compliance with TMP and temporary traffic management controls
Kate Valley	Shared access road with the construction site which needs maintenance and access considerations
Department of Conservation	Indigenous flora and fauna (lizards, birds)
Environment Canterbury (ECan)	Compliance with consent conditions, minimising the actual and potential effects on the environment
Community Liaison Group (CLG)	Group required by HDC consent conditions and to function as a forum for relying concerns, to discuss and provide feedback on management plans and to discuss results of monitoring and reports required by the conditions
Statutory Liaison Group (SLG)	DoC and an HDC approved independent peer reviewers experienced in the field of terrestrial ecology and restoration ecology
Landowners	Ongoing consultation in regard to access arrangements and impacts on farming operations
Adjacent landowners	Potential effects of the Project in relation to visual amenity and noise (predominantly operational noise)
Local organisations (Waipara District Residents Association, Waipara Valley Promotions Association Incorporated, Omihi Ratepayers, Waipara Valley Winegrowers Incorporated and Waipara Wine Village developers)	General interest in Project and potential adverse effects

Table 10 Project Stakeholders

4.6 Land Access Agreement Requirements

MainPower owns the 168ha ridge property that covers a 3km length of the ridge, the remaining land that the project sits on is owned by six other parties that have signed access agreements with MCWFL which has established and easement for access.

The properties are shown in Figure 7 below. The properties are used for farming operations and each property has independent requirements for access which are detailed in Appendix N of the Mt Cass Wind Farm Site Access Instruction.

Two key requirements that are not common practice on farms are:

1. All machinery and boots are to be cleaned and free of mud prior to entering Dovedale Farm
2. Mt Cass Station has Organic Holdings Ltd which is certified organic, and consideration must be given to this when considering herbicides etc for weed maintenance.

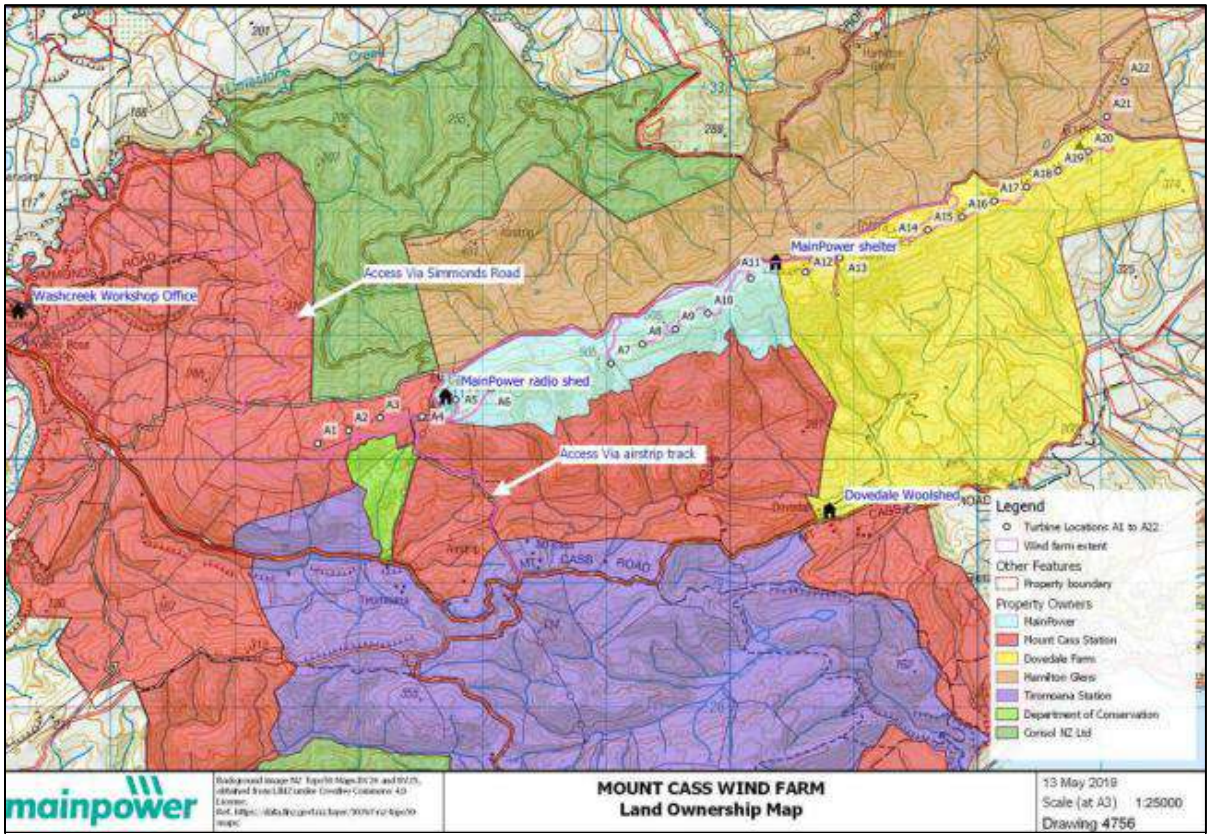


Figure 7 Mt Cass Landowner Map

4.7 Complaints

4.7.1 Complaints Process

The Consent Holder shall establish and publicise contact details for a liaison officer, so that members of the local community have a specified and known point of contact should they wish to raise any issues that may arise during construction and operation of the wind farm. A logbook detailing all calls and any action taken shall be kept and made available to Hurunui District Council on request.

Detail MCWFL Complaints process

1. Complaint issued via
    a. Website https://www.mtcasswindfarm.co.nz/contact-us,
    b. Phone 0800 309 080 - Greg Gummer Project Director / liaison officer
    c. Direct engagement from site staff via contact details provided at the project notice board at the site entrance.
    d. Hurunui District Council 03 314 8816
2. MCWFL direct complaint to the relevant contractor or address inhouse if operational
3. Record complaint on complaints register at noted in 4.7.2 below
4. Rectify issue
5. Provide feedback and closes out on register

4.7.2 Complaints Register

A register for any complaints shall be maintained for the construction activities and operation of the wind farm received by the Consent Holder including complaints in relation to traffic, noise, dust, shadow flicker or blade glint. The register shall record, the following:

- The date, time and duration of the incident that has resulted in a complaint.
- The location of the complainant when the incident was detected.
- The possible cause of the incident.
- Any corrective action undertaken by the Consent Holder in response to the complaint, including timing of that corrective action.
- The date and details of the response given to each complainant.

The complaints register shall be available to the Council and the Community Liaison Group at all reasonable times upon request.

Within 5 days of receipt of any complaint in accordance with condition [0], the Consent Holder shall advise the Hurunui District Council of the details of any complaint received and, where appropriate, of any remedial or corrective action taken, including the response provided to the complainant.

A template of this register is available in Appendix A:

5 Construction Method

5.1 Construction Overview

The project consists of building 7.5 km of access tracks along the Mt Cass Ridge Line to access the 22 WTG locations shown in Figure 8 below.

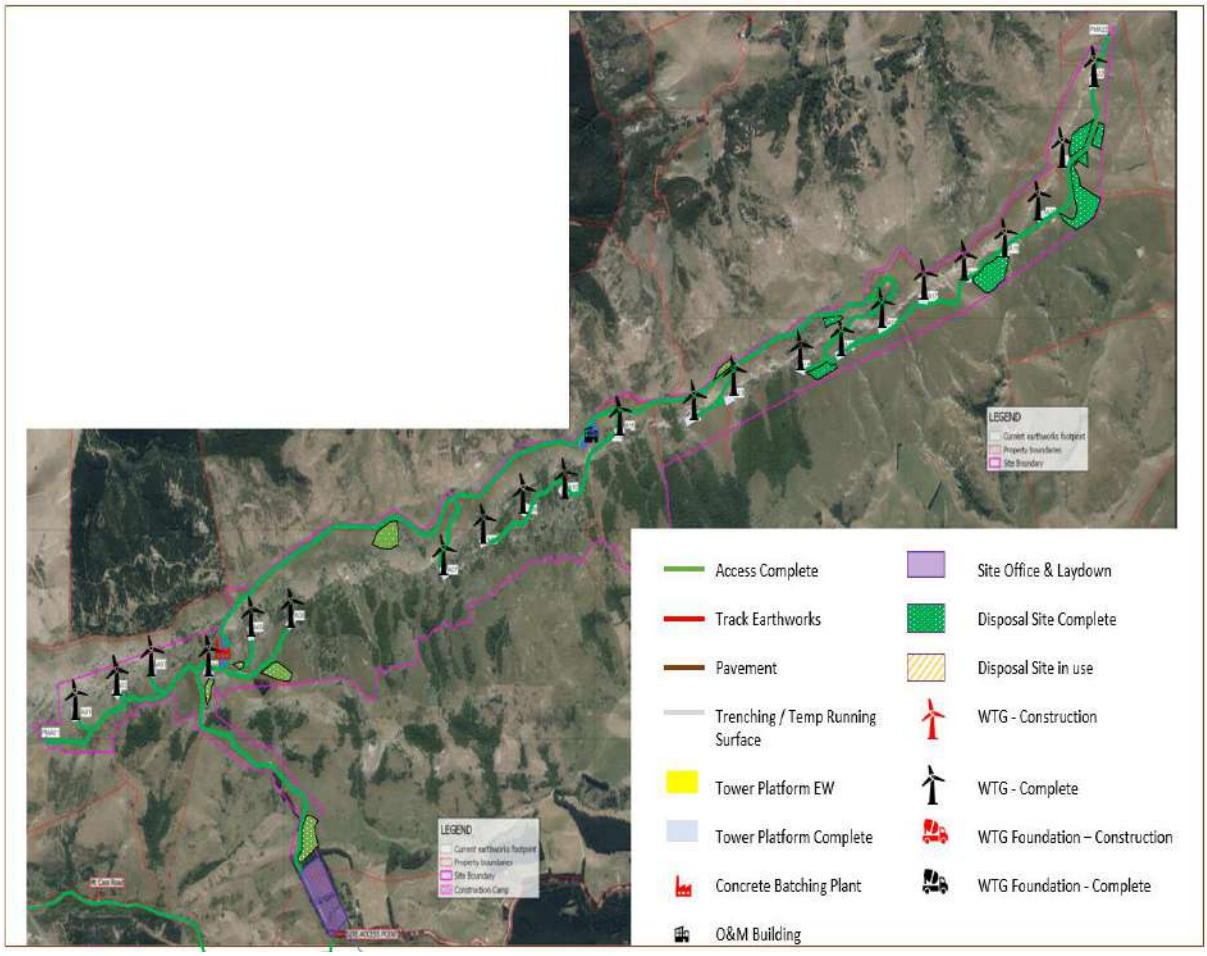


Figure 8 Mt Cass Wind Farm Schematic

5.1.1 Construction Zones

The site will be broken in to six zones to stage the construction. They are intended to follow a logical construction sequence and provide a staged entry to the site to ensure that all ecological controls and consent / landowner agreements are implement via a permit to work system.

The Six Zones are shown in Figure 9 below and are colour coded for easy identification.

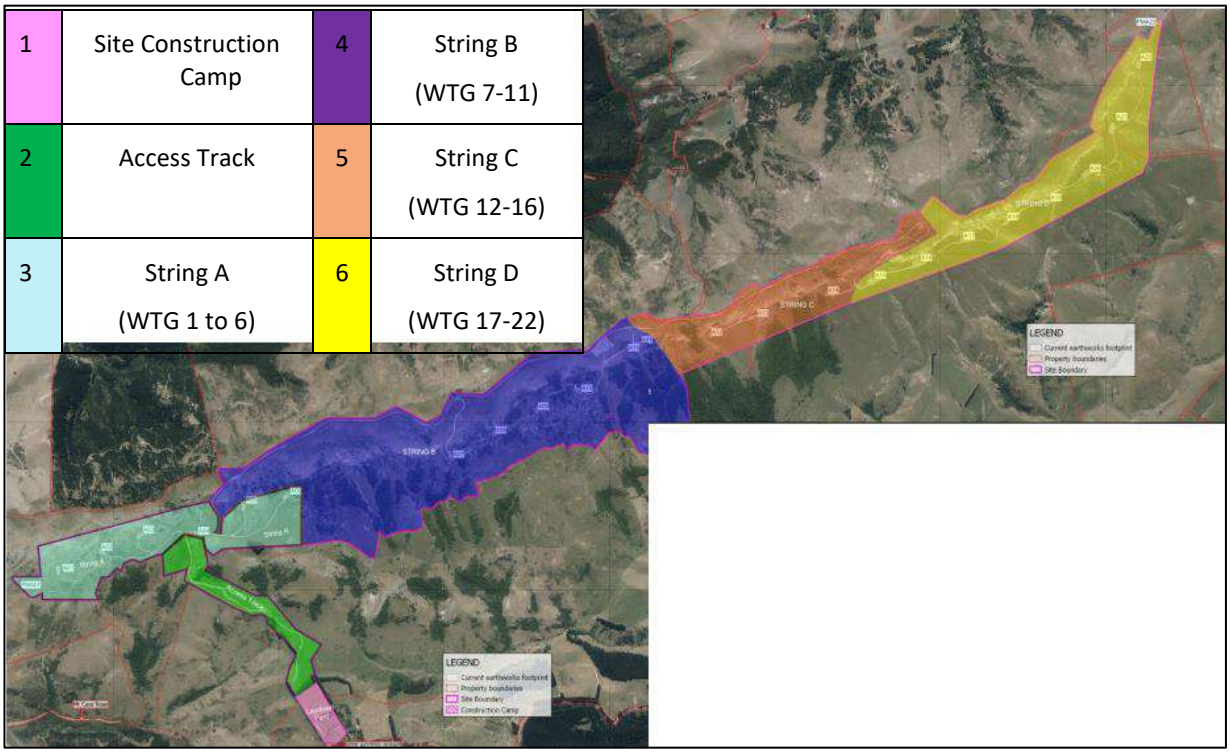


Figure 9 Mt Cass Construction Zone Boundary Plan

Prior to earthworks occurring the Project team is to ensure the site has had the appropriate preconstruction hold points completed i.e., lizard and rare plants surveys and snails on Mt Cass Public Road, the team is to be trained and inducted onto the site protocols.

5.1.2 Site Lay Down

Two site lay downs will be constructed by removing and stockpiling topsoil for later re-instatement. Imported aggregates will be used to form a hard stand area in both yards.

<u>Site Office & Laydown</u>

The site office is located at the site entrance. The trees through the middle of the site will be removed and placed into stockpiles where they will be mulched for future landscaping on the project. Once this is completed, the topsoil stripping operations will commence using one of the main earthwork crews.

The topsoil will be placed in a stockpile area outside of the yard outline, where it will be stored for the duration of the project prior to being re-spread over the yard area at the disestablishing stage. Some of the topsoil will also be utilised as a form of erosion control creating an earth bund around the yard area, which will stop water runoff to the outlying areas.

Where required, localised casting and filling of in situ material will be undertaken to ensure a flat surface is available for the purpose of running the project from the yard area.

Aggregate will then be imported from the yard and spread and compacted to a minimum depth.

An indicative layout of the site office is shown in Figure 10 below.

Figure 10 Main Construction Camp

Symonds Rd Site Laydown Yard

A second hard stand will be built at the intersection of Mt Cass and Symonds roads. This yard is used to store the wind turbine tower and blade units prior to transporting them to the site.

The construction method will be the same as the main site construction camp. Traffic management will be required to control the site entrance at this location which for construction will be via Symonds Road and then will change to the Mt Cass Rd for the turbine delivery. An indicative layout is shown in 11 below.

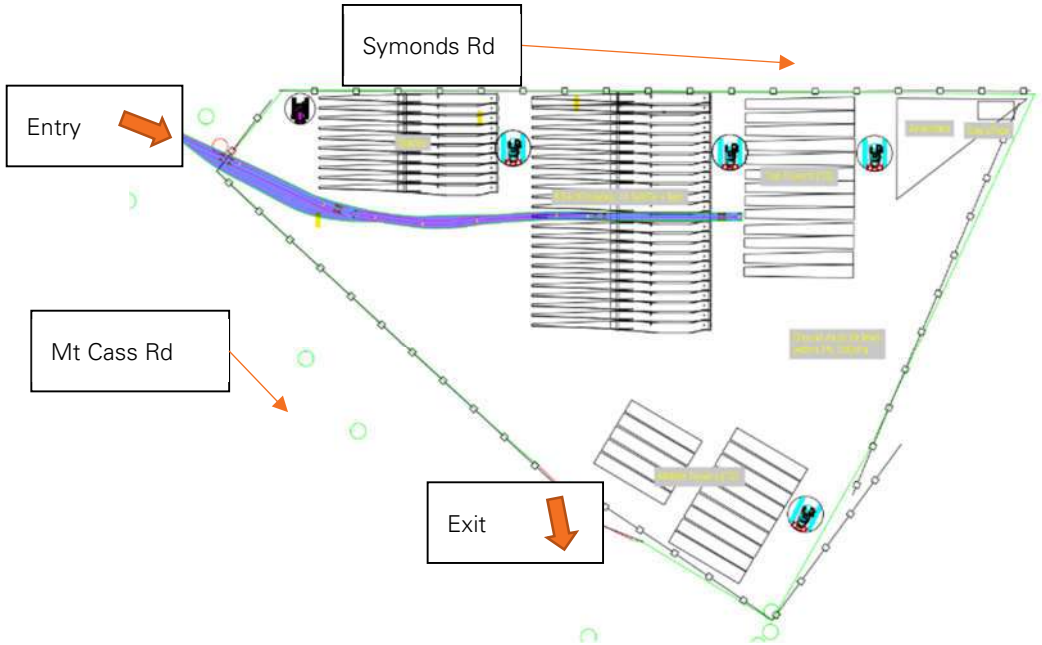


Figure 11 Indicative Construction Yard Layout at the intersection of Mt Cass and Symonds Rd

5.1.3 Erosion and Sediment Control

Where required on site, erosion and sediment control devices will be installed. This may be in the form of decanting earth bunds, clean or dirty water diversion drains, earth bunds, and sediment control ponds.

An Erosion and Sediment Control Plan forms part of this CMP and is located in Appendix D.

The controls will be installed progressively ahead of the earthworks taking into account exclusion and ecologically sensitive zones. They will be maintained by the site environmental team.

5.1.4 Access Track Construction

The access tracks will be constructed using a cut to fill and cut to waste (disposal site) operation. In the first instance site won fill will be used to construct the fill sections of the project. If there is a deficit in suitable material, then the project will revert to importing material to site. A temporary running course will be applied to allow access to the site to allow works to progress while the eBoP contractor installs electrical cabling.

Drains will be cut to the side of the track where required and culverts installed where water course from the track. Where the track is of a sufficient grade it may be cement stabilised and then an aggregate pavement will be constructed as the final wearing course.

5.1.5 Protection of Limestone at Golf Link Road

Where the road shown as MC50 crosses the limestone areas show in Figure 12 below, no equipment will be allowed to travel directly on top of the exposed rock.

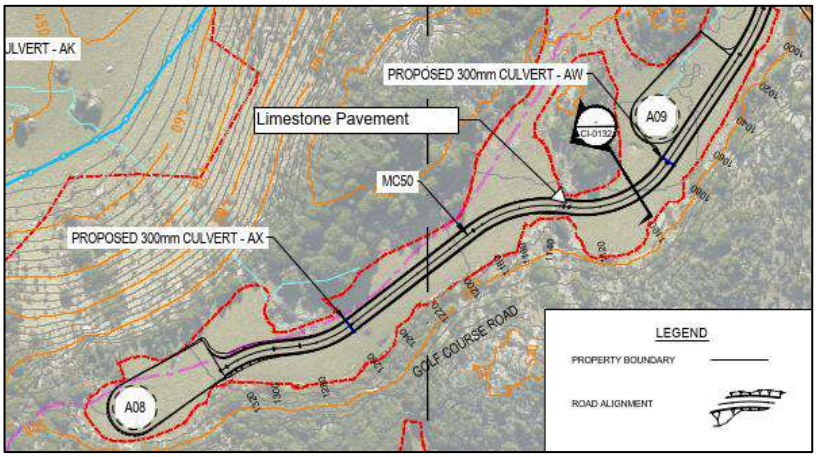


Figure 12 Limestone Pavement MC50 Golf Course Road

In accordance with HDC consent condition 45 crushed limestone will be tipped off prior to the area and pushed forward using a dozer to create the required road width. Works will progress forward using this methodology with trucks reversing along the alignment and tipping off at the tip head until the area is cleared. At no point will any heavy equipment be allowed to drive off the surface. The design will call for sufficient pavement thickness so that when the aggregate is compacted it does not damage the limestone below. An indicative cross section of this section of road taken from the Landscape Pattern Book is shown in Figure 13 below.

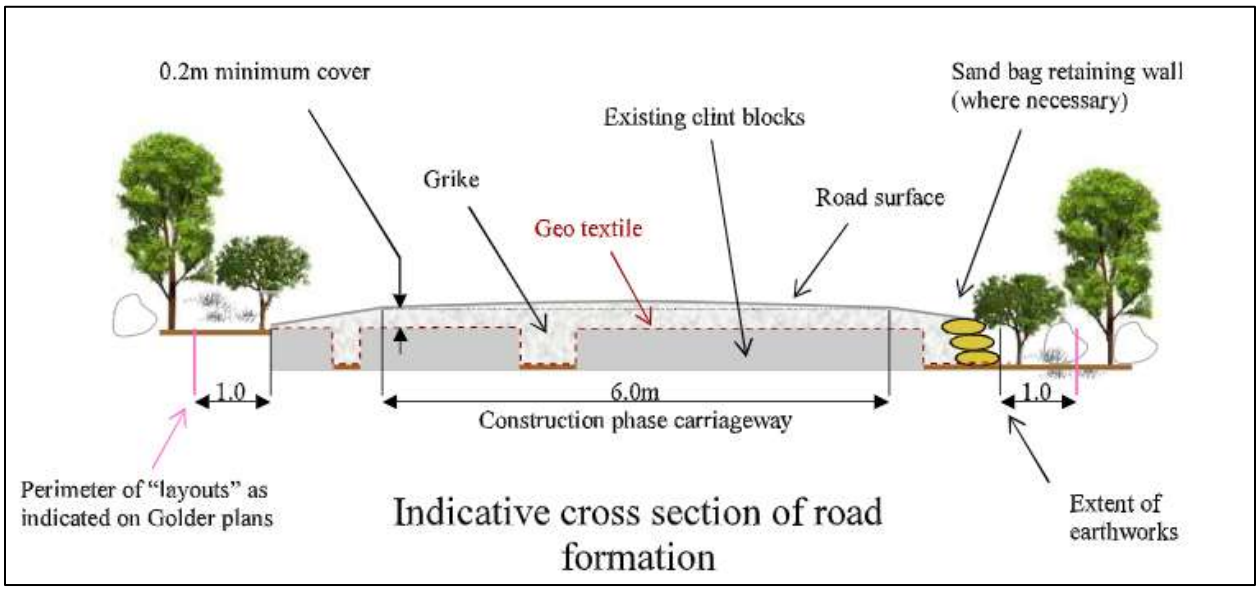


Figure 13 Indicative Protection of limestone at Golf Link Rd

For the electrical contractor to meet this requirement their cable conduits will be brought above ground at this location so that the pavement is not trenched into.

5.1.6 Disposal Sites

A number of disposal site locations have been consented along the project. These will be stripped of topsoil and used to accept excavated material that will not be used in the project. These will be re-instated progressively and contoured into the local landscape.

5.1.7 Turbine Pads and Excavation

Each turbine location requires a large flat area to be constructed to act as an assembly area and crane pad. These will be constructed as part of the earthwork's operation.

The location of the turbine foundations will be inspected using GPR survey after excavation to ensure that no tomos are present under the foundation base and the rock will be tested to ensure that it has suitable bearing capacity for the foundations.

5.1.8 Concrete Batching Plant

A concrete batching plant will be assembled at the consented location near WTG 04. The area will be constructed using the same method as the laydown areas and the concept layout is shown in Figure 14 below. The plant will be feed from a cement silo and three aggregate bins. Water will be carted to the batching plant and stored in tanks. The batching plant will be removed from site within 6 months after completion of the project.

Figure 14 Batching Plant Pad Concept Layout

5.1.9 Cable installation

The cables that are to run from the turbines to the substation will be installed by the eBoP contractor. These will be trenched within the existing disturbed areas of the access tracks.

5.1.10 Tower Foundations

Each turbine requires that a large reinforced concrete foundation is constructed to bolt the turbine tower to. These will be constructed below the finished level of the turbine pad. A hole is excavated, and a blinding lay of concrete is poured, then the reinforcing cage is tied, and formwork installed. The concrete is then pumped into the forms and the excavation is backfilled once the concrete meets the required strength. An example of this is shown in Figure 15 below.

Figure 15 Example of a Tower Foundation Concrete Pour

5.1.11 Installation of Turbines

Once the foundations are of sufficient strength and backfilled, the S&I contractor will transport the turbines components from the construction laydown yard to the allocated hard stands and assemble them with a crane. An example of these activities is shown in Figure 16.

Figure 16 Example of Tower Section Delivery from a Historic Project

5.1.12 Remediation

Where the site has been disturbed during construction outside of the ongoing operational areas it will be reinstated to meet the requirements of the consent and the site rehabilitation pattern book. This is located in Appendix A of B10 Landscaping Management Plan.

The remediation will be staged and progressively stabilised to ensure the resource consent requirements are met to reduce the sediment risk. This will be defined in more detail once the final scope of work is established after detailed design and the construction programme is finalised.

The concrete batching plant is to be removed from site within 6 months of completion of the wind farm construction.

5.1.13 Limits of disturbance

One of the key consent requirements is the limits of disturbance of sensitive ecological areas.

Site clearing will be restricted to areas of the Project site within the outline of the earthwork area to comply with the limits in Condition 13 of the HDC land use consent, which is shown in Table 11:

Ecosystem type	Limit
Exposed limestone disturbance (hectares)	
Pavement and boulder field	2.04
Pavement	0.89
Vegetation clearance (hectares)*	
Indigenous shrubland	0.71
Indigenous forest	0.08

Table 11 Conditon 13 R90 Clearance Limits

To ensure that these disturbance limits are not exceeded, the design team will overlay the design model with the ecological survey data uploaded into a GIS map.

The mapping overlay will be completed once the design footprint has been finalised

The project team will conduct as-built surveys throughout the earthworks phase, which calculate the actual areas disturbed and report on them fortnightly to HDC per ecosystem type in table 11.

At the completion of construction, as built plans shall be provided and will be independently verified using an independent third-party and submitted to HDC.

This is further detailed in the Ecology and Landscape Management Plans in Appendix L and M respectively.

5.2 Construction staging

The construction is very linear due to the topography of the site. Once the project is established the general sequence of each turbine string is shown in the flow chart in Figure 17.

Figure 17 General Construction Sequence

Appendix B contains a month-by-month sequence which demonstrates the construction sequence in more detail.

6 Control Measures

Specific control measures for each aspect of the environment and details of how consent conditions will be complied with is set out in the sub-plans in Appendices D to M.

These plans are designed to be high level and are the framework which provides the delivery team with the information required to develop construction work packs specific to the individual scopes of work that they are assigned to carry out.

Construction Work Packs are a collection of documents that cover a definable portion of work performed by the project and/or subcontractor. The project team divides the work scope into manageable portions (Work Packs) so that activities can be planned and executed with an appropriate level of detail. This may be by trade, geographical location, area, structure, stage of project, etc.

They describe how work is going to be carried out; who is responsible for it; what checks, inspections and tests are going to be carried out and what records are going to be maintained. Work Pack documentation is compiled progressively during construction and commissioning to verify compliance to the Contract codes and specifications.

Work Packs are typically aligned with the work breakdown structure and contain information form the following sources:

- New Zealand Law
- Design drawings
- Specification
- Contract documents
- Resource consents
- Management Plans
- Best practice guidelines
- Relevant Standards

Generally, the work packs will contain:

- Site Specific Method Statement
- Job Safety and Environment Analysis (JSEA)
- Inspection test plans (ITPs)
- Standard Operating Procedures (SOPs)
- Permits to work
- Traffic Management Plans
- Lift Plans
- Emergency Plans

7 Training

All staff working on the contract will be suitably experienced and competent for the tasks they are assigned to perform. This training will be a mixture of formal qualifications and informal onsite training depending on the persons role on the project and requirements by their employer and compliance with relevant legislation.

Training and awareness programmes are critical to ensuring that there is an appropriate level of environmental and sustainability knowledge for those staff and subcontractors involved in the project.

Training of site staff will be provided through project inductions, weekly toolbox talks, information posters such as spill response plans and any site-specific training considered necessary such as archaeological discovery protocols, spill kit training, erosion and sediment control training etc. Notice boards will include environmental information including EHS Alert and relevant updates.

All staff and subcontractors will be inducted to the site prior to starting works. This induction will include the items identified in the training matrix in Table 12 below and is specific to the persons role on the project.

Mt Cass Windfarm Training Matrix						
Training Area	**Construction Worker**	**Machine Operator**	**Management**	**Fire Response Team**	**Enviro Team**	**Visitor**
Emergency Response	Site Evacuation Procedure Site First Aiders First Aid Locations Fire Extinguisher Locations Muster Points	Site Evacuation Procedure Site First Aiders First Aid Locations Fire Extinguisher Locations Muster Points	Site Evacuation Procedure Site First Aiders First Aid Locations Fire Extinguisher Locations Muster Points	Site Evacuation Procedure Site First Aiders First Aid Locations Fire Extinguisher Locations Muster Points Water Storage locations	Site Evacuation Procedure Site First Aiders First Aid Locations Fire Extinguisher Locations Muster Points	Site Evacuation Procedure Site First Aiders First Aid Locations Fire Extinguisher Locations Muster Points
ESCP	ESCP awareness	ESCP – Design and Implementation	ESCP – Design, Implementation and monitoring requirements	N/A	ESCP – Design, Implementation and monitoring requirements	ESCP awareness
Dust Management	Dust Management Plan Awareness Complaint procedure	Dust Management Plan Awareness Control measures Complaint procedures	Dust Management Plan Awareness Control measures Monitoring Requirements Complaint procedures	N/A	Dust Management Plan Awareness Control measures Monitoring Requirements Complaint procedures	Dust Management Plan Awareness
Hazardous Substance	Storage & Handling Requirements MSDS locations	Storage Requirements MSDS locations	HASNO Requirements	MSDS Locations HASNO Register Location	Storage Requirements MSDS locations	MSDS Locations Spill Response

	Refuelling procedure Spill Response Plan Spill Kit Location & Use	Refuelling procedure Spill Response Plan Spill Kit Location & Use	Storage Requirements MSDS locations Refuelling procedure Spill Response Plan Spill Kit Location & Use		Refuelling procedure Spill Response Plan Spill Kit Location & Use	
Archaeology and Cultural	ADP SCSP	ADP SCSP	ADP SCSP	N/A	ADP SCSP	ADP SCSP
Noise Management	Noise Management Plan Awareness Complaint procedure	Noise Management Plan Awareness Complaint procedure	Noise Management Plan Awareness Complaint procedure Noise Monitoring	N/A	Noise Management Plan Awareness Complaint procedure Noise Monitoring	Noise Management Plan Awareness Complaint procedure
Traffic Management	TMP – TSL Requirements & Site-Specific Requirements	TMP – TSL Requirements & Site-Specific Requirements	TMP Requirements Monitoring Requirements CAR requirements	N/A	TMP – TSL Requirements & Site-Specific Requirements	TMP – TSL Requirements & Site-Specific Requirements
Fire Management	FMP awareness Smoking policy Permit to work system Mitigation Requirements	FMP awareness Smoking policy Permit to work system	FMP awareness Smoking policy Permit to work system	FMP awareness Smoking policy Permit to work system	FMP awareness Smoking policy Permit to work system	FMP awareness Smoking policy Mitigation Requirements

	Firefighting equipment locations Key Staff trained in fire extinguisher use Emergency and contact numbers Emergency Muster points	Mitigation Requirements Firefighting equipment locations Key Staff trained in fire extinguisher use Emergency and contact numbers Emergency Muster points Additional plant checks and requirements	Mitigation Requirements Firefighting equipment locations Key Staff trained in fire extinguisher use Emergency and contact numbers Emergency Muster points Additional plant checks and requirements	Mitigation Requirements Firefighting equipment locations Trained in fire extinguisher use Trained in water cart use. Site water sources Emergency and contact numbers Emergency Muster points Additional plant checks and requirements	Mitigation Requirements Firefighting equipment locations Key Staff trained in fire extinguisher use Emergency and contact numbers Emergency Muster points Additional plant checks and requirements	Firefighting equipment locations Emergency and contact numbers Emergency Muster points
Pest Weeds	Weed Management Plan Awareness Plant Hygiene procedures.	Weed Management Plan Awareness Plant Hygiene procedures. Plant Inspection requirements. Basic pest weed identification training	Weed Management Plan Awareness Plant Hygiene procedures. Plant Inspection requirements. Basic pest weed identification training	N/A	Weed Management Plan Awareness Plant Hygiene procedures. Plant Inspection requirements. Basic pest weed identification training	Weed Management Plan Awareness
Ecology	Exclusion Zones NZ Falcon vs Hawk identification training	Exclusion Zones NZ Falcon vs Hawk identification training	Exclusion Zones	N/A	Exclusion Zones	Exclusion Zones Sink Holes / Tomos

	Lizard awareness training Vegetation Permit to work requirements Sink Holes / Tomos Key ecology contacts	Lizard awareness training Vegetation Permit to work requirements Least impact technics for indigenous vegetation disturbance Indigenous vegetation limitation and survey requirements Basic indigenous flora and fauna training Sink Holes / Tomos Key ecology contacts	NZ Falcon vs Hawk identification training Lizard awareness training Vegetation Permit to work requirements Least impact technics for indigenous vegetation disturbance Indigenous vegetation limitation and survey requirements Basic indigenous flora and fauna training Sink Holes / Tomos Key ecology contacts Reporting requirements Micro-siting requirements		NZ Falcon vs Hawk identification training Lizard awareness training Vegetation Permit to work requirements Least impact technics for indigenous vegetation disturbance Indigenous vegetation limitation and survey requirements Basic indigenous flora and fauna training Sink Holes / Tomos Key ecology contacts	
Landscape	N/A	Landscape Management Plan Awareness	Landscape Management Plan Requirements	N/A	Landscape Management Plan Awareness	N/A

		The requirements of the landscape rehabilitation handbook. least impact techniques when disturbing or clearing limestone Methods for working on limestone pavements Limits of disturbance and reporting requirements	The requirements of the landscape rehabilitation handbook. least impact techniques when disturbing or clearing limestone Methods for working on limestone pavements Limits of disturbance and reporting requirements		The requirements of the landscape rehabilitation handbook. least impact techniques when disturbing or clearing limestone Methods for working on limestone pavements Limits of disturbance and reporting requirements	
Landowner Requirements	Requirements of landowner agreements	Requirements of landowner agreements	Requirements of landowner agreements	Requirements of landowner agreements	Requirements of landowner agreements	Requirements of landowner agreements
Dealing with Public	Complaints process Media protocols	Complaints process Media protocols	Complaints process Media protocols	Complaints process Media protocols	Complaints process Media protocols	Complaints process Media protocols

Table 12 MCWF Training Matrix

8 Emergency Response

The Contractors shall develop and implement a process to address the management of all potential crises and emergencies involving Project activities, and that personnel while on the project will adhere to and operate under the Contractors respective procedures and requirements.

The Contractor will have in place an Emergency Response Plan (ERP) in accordance with its HSE responsibilities. The ERP is to effectively respond to any foreseeable emergency or potential catastrophe and that in the event of an emergency, plans and capabilities are in place or dealing with such situations so as to preserve the health and safety of all personnel on the Site, protect the environment and preserve company capability and reputation.

The Contractors will have in place emergency response procedures that identify its respective muster points, details on the communication processes, schedules for exercises and adequate provision of resources including people and equipment.

MCWF will establish communication with the emergency services and ensure that they are familiar with the site.

MCWF will ensure effective coordination of Contractors emergency procedures via the implementation of a site wide Emergency Management Team (EMT) consisting of Contractor representative and safety representatives as appropriate.

A high-level emergency response plan is provided in the table below which will form the basis for the contractors Emergency Response Plans.

WHEN AN EMERGENCY SITUATION ARISES, IT IS MOST IMPORTANT TO

- Remain Calm
- Don't Panic
- Respond Quickly and Decisively
- Remember Your Own Safety

IF IT IS SAFE TO DO SO

- Wait at the location for further instructions
- e.g. evacuation or return to work
- Check for injured or trapped people
- Reduce or eliminate the hazard
- Extinguish ignition sources
- Disconnect electrical equipment

FOR ALL CONSTRUCTION EMERGENCIES

- Stop work
- Warn other people who may be at risk
  - Notify your supervisor or the site office
  - What has happened? Where?
  - Number of people involved?
- Evacuate if advised to do so
- Follow actions "In the Event of" below. (Apply one or more actions depending on the emergency)

IF YOU ARE NOTIFIED TO EVACUATE

- Emergency Response Co-ordinator to inform all work group leader to evacuate site use two-way communication
- Move in an orderly fashion **Do not run**
- Go directly to the designated emergency muster point location unless otherwise advised
- Have your name noted at the muster point
- Remain at the muster point and await further instructions
- Return to normal duties when directed by McConnell

EMERGENCY CONTACTS

Emergency Services

Dial 111

Emergency Response Co-ordinator

[name & contact number] - TBC

First Aid Attendant (s)

[name & contact number] TBC

[other – eg client representative, safety regulator, emergency services

IN THE EVENT

CONTACT WITH UNDERGROUND OR OVERHEAD SERVICES

UNDERGROUND SERVICES

- Stop work immediately
- Ensure someone has contacted the Emergency Response Co-ordinator
- Secure or evacuate the area to prevent others from risk of injury
- Warn others in the immediate vicinity
- Shut off sources of ignition (if gas)
- Ensure that the relevant services company has been contacted

OVERHEAD SERVICES

- Stop work immediately
- Ensure someone has contacted the Emergency Response Co-ordinator
- Secure or evacuate the area to prevent others from risk of injury
- Warn others in the immediate vicinity
- Ensure that the relevant services company has been contacted
- Stay in plant item
- Do not make contact with plant and ground at the same time
- If a fire occurs, jump well clear

SERIOUS INJURY OR MEDICAL EMERGENCY & NATURAL EVENT

SERIOUS INJURY OR MEDICAL EMERGENCY

- Contact the First Aid Attendant and Emergency Response Co-ordinator
- Stay with the injured person until assistance arrives
- Do not move the injured person unless the person is at risk of further injury
- First Aider to take charge of situation until emergency help arrives
- Vacate the area when assistance arrives

NATURAL EVENTs

- Move to a point or area of safety
- Contact the Emergency Response Co-ordinator
- Assist any injured person if safe to do so.
- Follow site specific response instructions

THE COLLAPSE OF TEMPORARY STRUCTURES

- Stop work immediately
- Notify the supervisor/site office
- Move all persons away from the collapsed area
- Aid any injured persons when safe to do so.
- Evacuate site if required to do so.
- Re-enter area when safe to do so and advised that structural collapse is no longer likely.

EXTERNAL THREAT

RAGE / UNREST

- Stop work immediately
- Contact the supervisor/foreman for assistance.
- Move to a position/area of safety
- Do not engage external threat(s)
- Evacuate if /when advised to do so.

SPILLAGE

- Shut down / isolate spillage source
- Report the incident to your supervisor
- Contain the contaminant or spillage
- Secure sources of ignition
  - Shut down non-essential plant
  - Stop hot work in the immediate area
  - Don't smoke or cause sparks
  - Move upwind
- Remain at the scene until made safe
  - Provide further help if required
  - If a witness to incident provide information for incident report
- Prevent contaminant from entering stormwater system and / or watercourses
- HOSING DOWN IS TO BE AVOIDED
- Clean up of contaminant to be undertaken as priority once it has been contained and it is safe to do so

A FIRE

- Ensure someone has contacted the Emergency Response Co-ordinator and evacuate if advised to do so.
- Select the correct extinguisher and be sure you know how to use it
- If in doubt READ THE INSTRUCTIONS
- If possible do not let the fire get between you and your escape route
- Do not get too close to the fire
- Test the extinguisher to ensure it works before approaching the fire
- Direct the extinguisher at the flame not the smoke
- NOTE: Do not attempt to fight the fire if you do not feel safe to do so. Raise the alarm and leave the area in accordance with

A MOTOR VEHICLE OR PLANT INCIDENT

- Check for danger to you or any injured person.
- Don't move injured person unless in immediate danger.
- Do not move plant or vehicle(s) unless their location presents an immediate danger to others.
- Ensure the vehicle is stable. Turn engine off and isolate the battery. Keep watch for fuel leaks/fire.
- Contact the First Aid Attendant and the Emergency Response Co-ordinator and advise injury type, severity, location, numbers
- First Aider to take charge of the situation until emergency help arrives
- Person sent to access point (if possible, with a radio or mobile phone) to guide emergency vehicles and ensure no unauthorised entry

9 Monitoring and Maintenance During Construction

As part of the control measures, on-going site monitoring by the contractor and wider project team will be undertaken. This will ensure that all the control measures detailed in this plan and all sub-plans have been properly implemented and are functioning effectively.

Routine inspections of site and any mitigation measures in place will be undertaken daily by visual inspection as part of our usual work. Spot checks will be carried out by a suitable person and, depending on the findings, control measures and processes may be reviewed and improved.

The overall monitoring requirements for each environmental aspect are summarised in Table 13 below. Further detail of the monitoring, inspections and reporting required is detailed in the relevant sub-plans.

Relevant Management Plan (MP)	Aspect	Type	Frequency	Activity	Responsibility
Dust MP, Section 3.6	Dust	Visual/ Written	Daily	Check weather forecast for high winds, inspect site to ensure effectiveness of controls and maintain a monitoring log.	All Contractor Project Managers & Environmental Advisors
			Weekly	Environmental controls site check and inspect adjacent sites for dust.	
Noise MP, Section 6	Noise	Sound/ Written	Fortnightly for first 2 months	Verify noise levels assumed and to ensure ongoing compliance.	Environmental Advisor
Hazardous Substance MP, Section 8	Plant Condition	Visual	Daily	Visually check Plant prior to operating at start of day.	All Contractor Project Managers & relevant trained staff
	Site Maintenance	Visual/ Written	Weekly	Spill Kit inventory & site inspection	Environmental Advisor
			Monthly	Check quantities and ensure all hazardous substances have been noted with relevant SDS	
	Hazardous Substance Spills	Training	Bi-annually	Spill response drill	All Contractor Project Managers

Erosion and Sediment Control Plan, Appendix F	Erosion and Sediment	Visual	Weekly or after a Storm Event	Refer to Appendix F for the ESCP – Toolbox checklists for control devices.	MCWF Project Engineers & Environmental Advisors
Landscape MP, Section 6 & 7	Landscape disturbance	Visual/ Written	Fortnightly	Survey disturbed locations and report to MCWFL.	Civil Contractor Project Manager
			Full Duration of Works	A general overview of site and mention to manager if any unplanned disturbance is noted.	All Staff
	Karst	Advice	Ad hoc	Provide advice for micro-siting, training and information for site induction.	Karst Specialist
Weed MP, Section 5	Site Audit	Visual/ Written	Monthly	Site audit to ensure compliance with plan.	Environmental Advisor & MCWFL Engineers
			Annual	Monitoring to detect and remove any ecologically important weeds – recorded and removed if found.	MCWFL's Ecologist
Fire MP, Appendix B	Emergency	Training	First arrival on Site	Inductions will address the smoking policy on site, Hot Work Permits, emergency phone numbers, and aspects of the Emergency Response Plan and the muster area.	All Contractor Project Managers
Accidental Discovery Protocol Plan, Section 6	Cultural	Written	As Required	Training records, visitor records from representatives of Waitaha Ki Waitaha, Te Runanga o Ngāi Tahu and Te Ngāi Tūāhuriri Runanga or Heritage New Zealand Pouhere Taonga with notes made of any observations made.	All Contractor Project Managers & wider team
				Make records of any relevant discovery and implement relevant Accidental Discovery Protocol	

Accidental Discovery Protocol Plan, Section 6		Training	First arrival on site	Ensure that contractors involved with earthmoving activities have received appropriate training and are aware of the requirement to undertake and monitor earthmoving activities in a way that enables the identification of Wāhi Tapu, Wāhi Taonga, Urupā or historic cultural sites.	Construction Manager
Traffic Management Plan	Site Awareness	Visual	Daily	Consistently inspecting and being aware of controls confirming the effectiveness.	All Contractor Project Managers and Staff site wide.

Table 13 Monitoring and Maintenance Summary

10 Audits Process

10.1 Audit Schedule

This audit schedule in Table 14 is an integral part of the Construction Management Plan for the wind farm. MCWFL have engaged independent auditors to inspect construction compliance with the CMP and relevant subplans. In addition to the independent auditors MCWFL Project Engineers will also carry out monthly audits assessing compliance with CMP.

The individual contractors will also carry out daily, weekly and monthly inspections as per their internal procedures. This will be addressed in their individual management plans for their relevant scope of work.

Audit Type	By Whom	
Environmental Compliance	MCWFL Engineering Specialist	Monthly
Erosion Sediment Controls	cBoP MCWFL Independent Auditor	Daily Monthly
HSE Compliance	HSE Advisor	Monthly
Traffic Management	STMS	Daily

Table 14 CMP Audit Schedule

10.2 Corrective Actions

Corrective and preventative actions resulting from compliance monitoring, routine inspections, internal and external audits and regulatory compliance monitoring will be undertaken in a timely manner. Ultimate responsibility for this sits with the Construction Manager, however this will be appropriately delegated to the relevant contractors Project Manager.

Appendix A:

Complaints Register

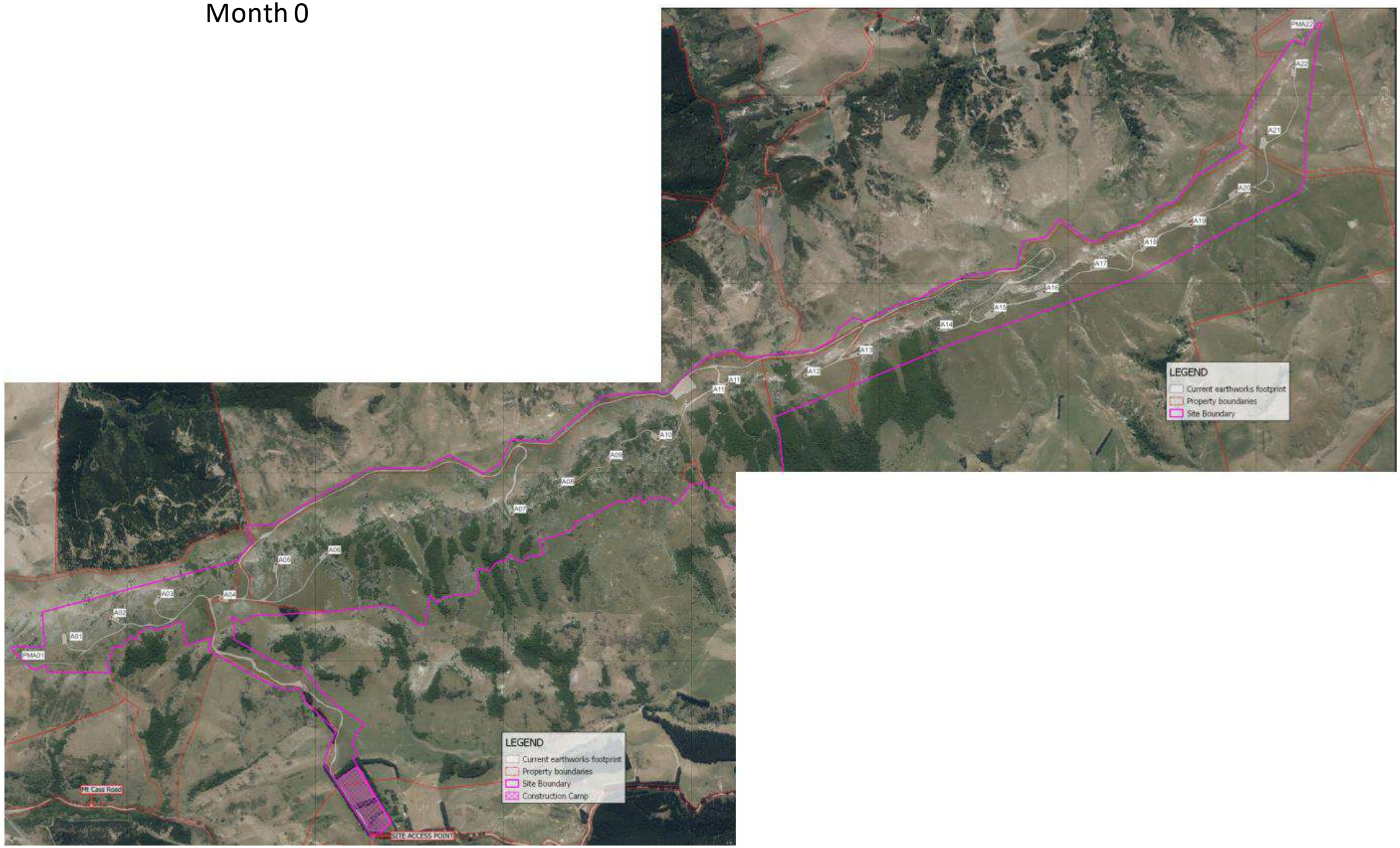
Mt Cass Wind Farm - Complaint Register

Date	Time	Name and address	Via	Location of Compliant	Type of Compliant	Details, including the possible cause, the duration the incident occurred	Response Type	Response noting the preventative action	Time when the preventative action took place	Response From	Date Sent

Appendix B:

Construction Sequencing

Month 0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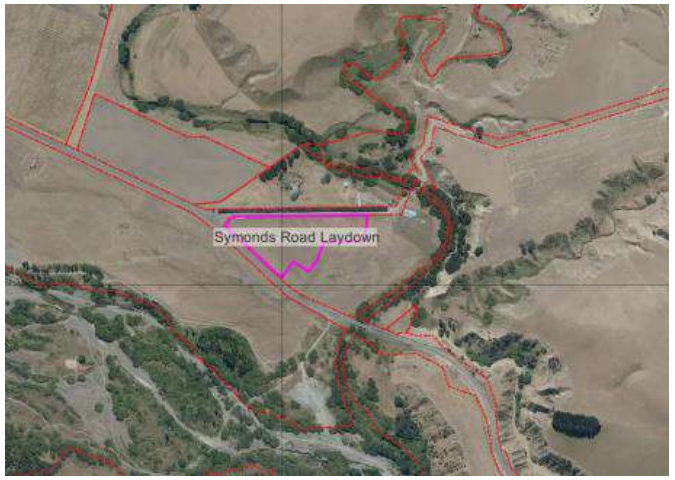
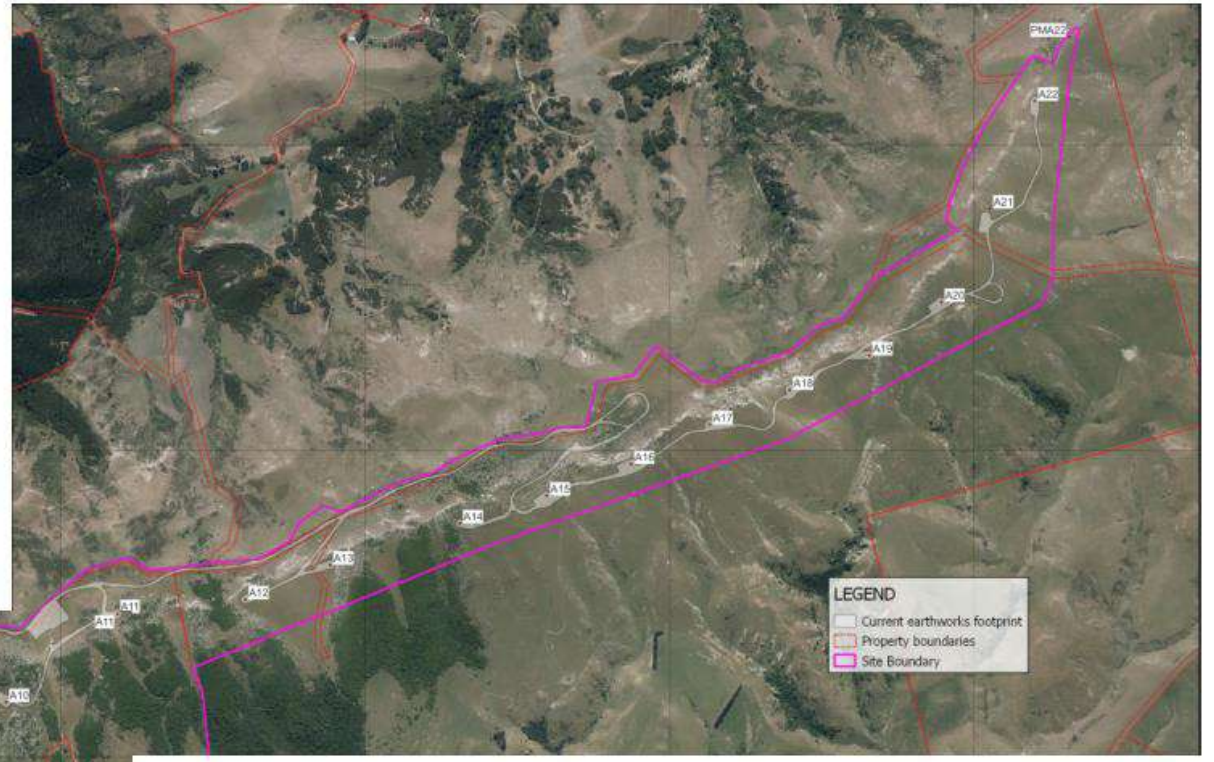
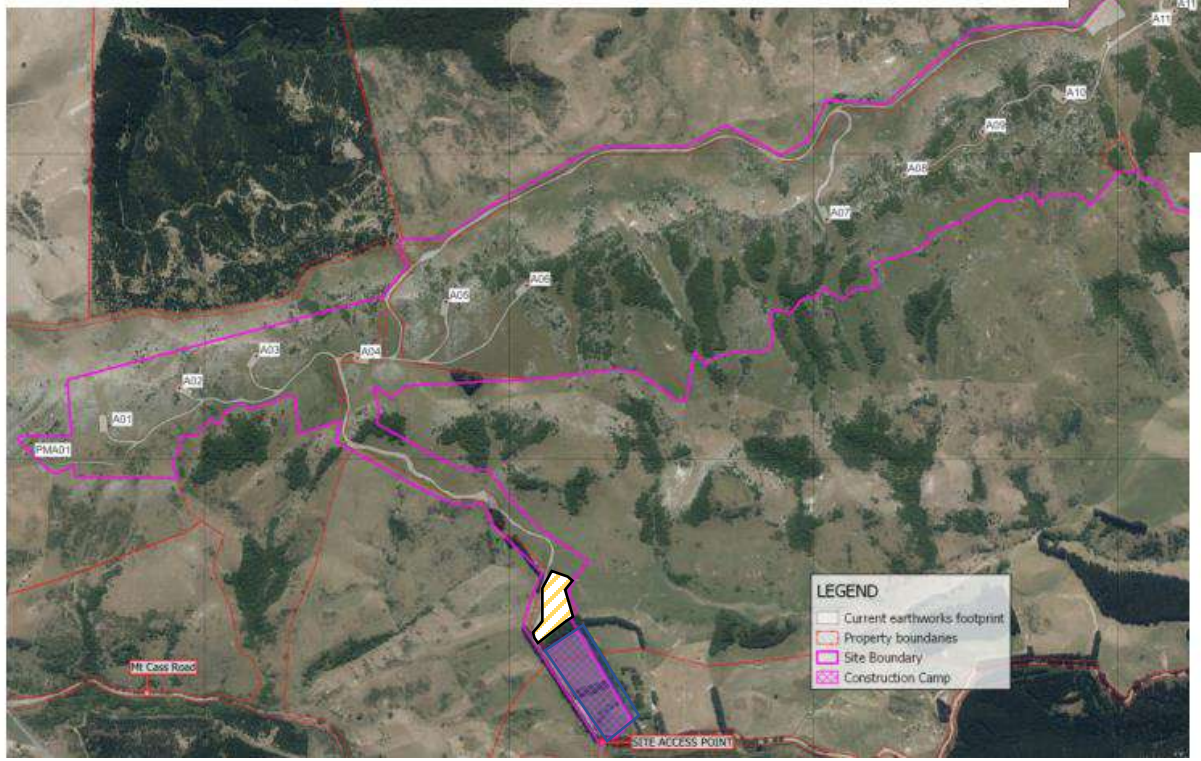
PMA01
LEGEND
Current earthworks footprint
Property boundaries
Site Boundary
Construction Camp
Mt Cass Road
SITE ACCESS POINT

Month 1







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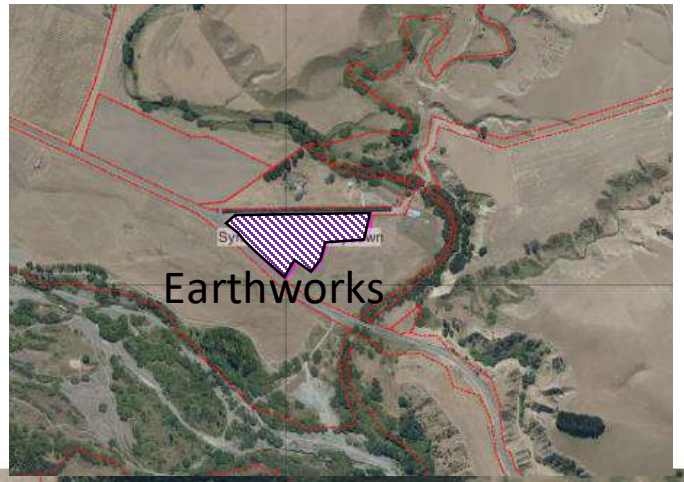
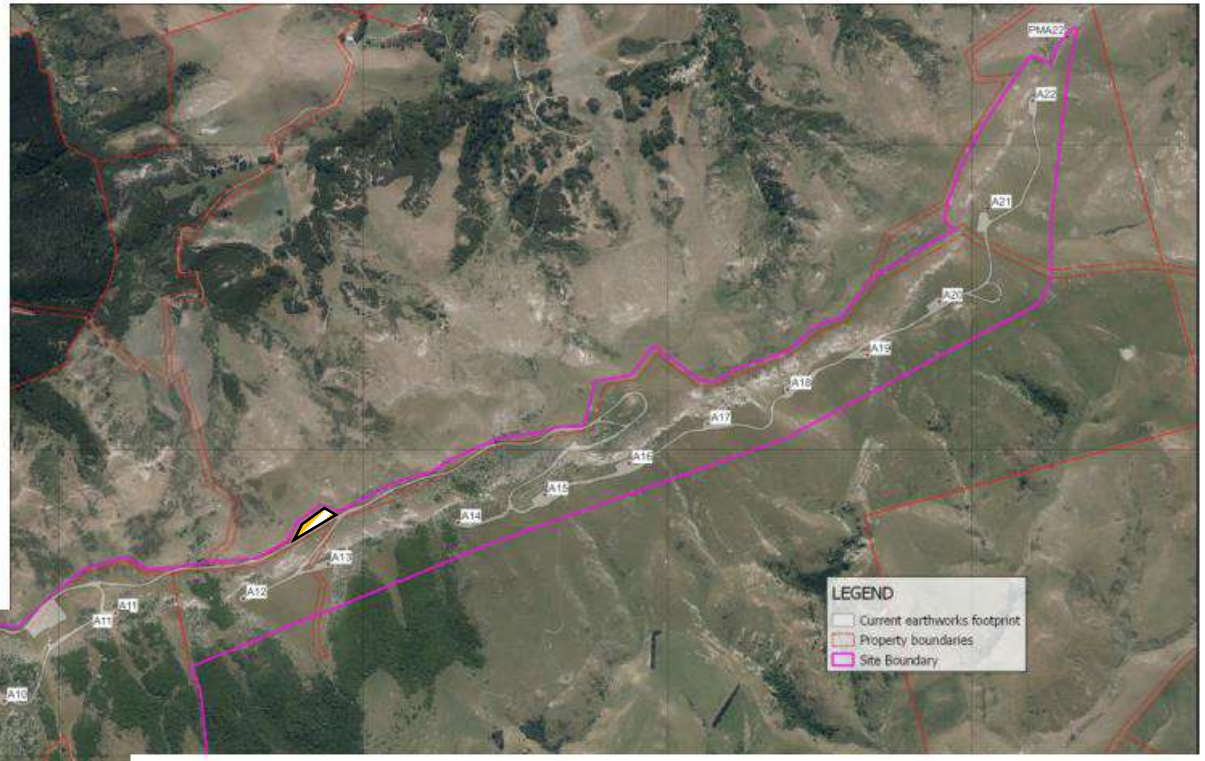
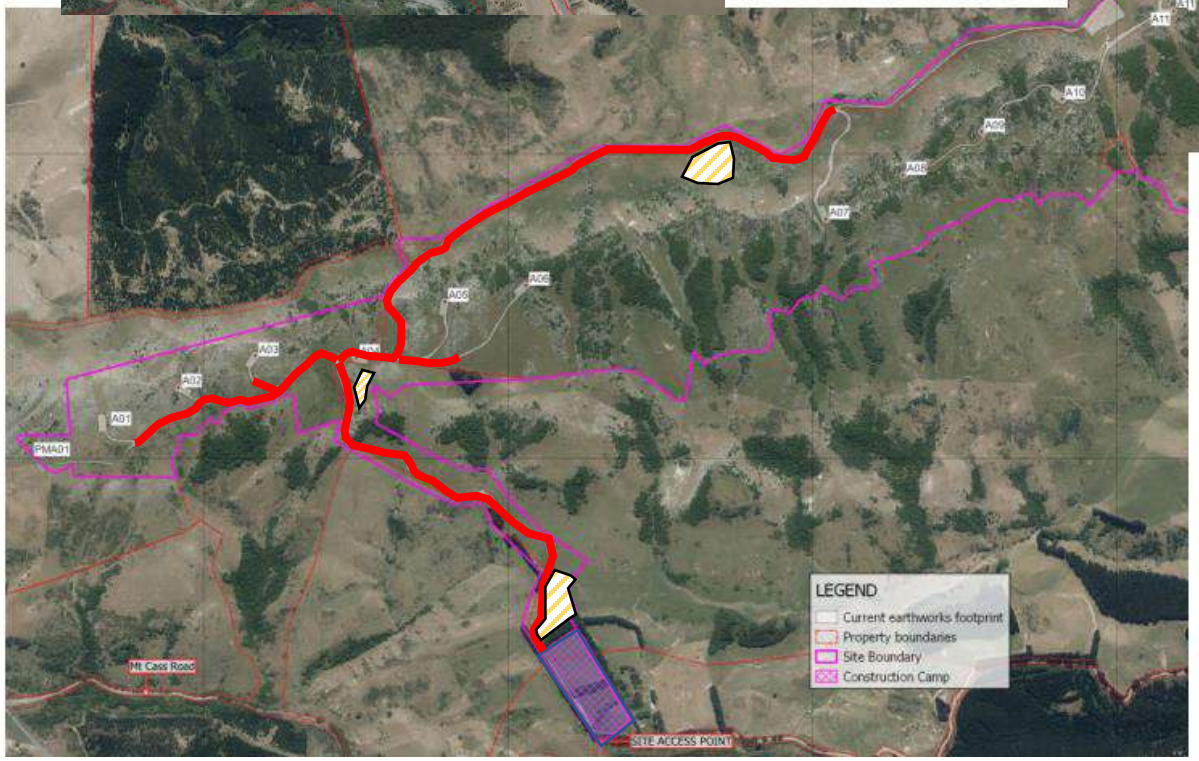
Month 2







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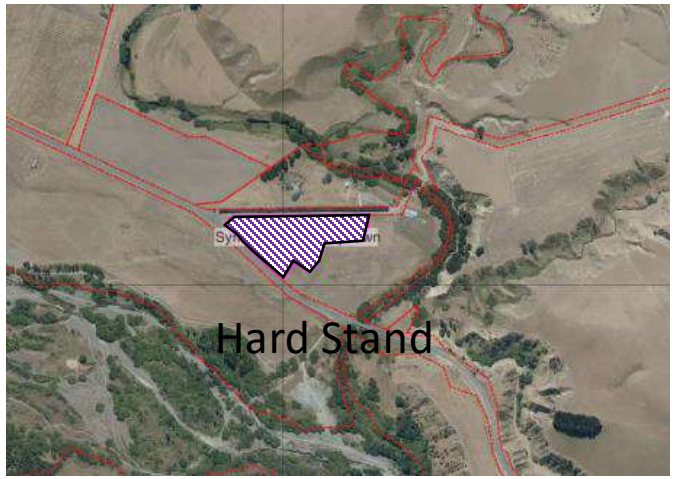

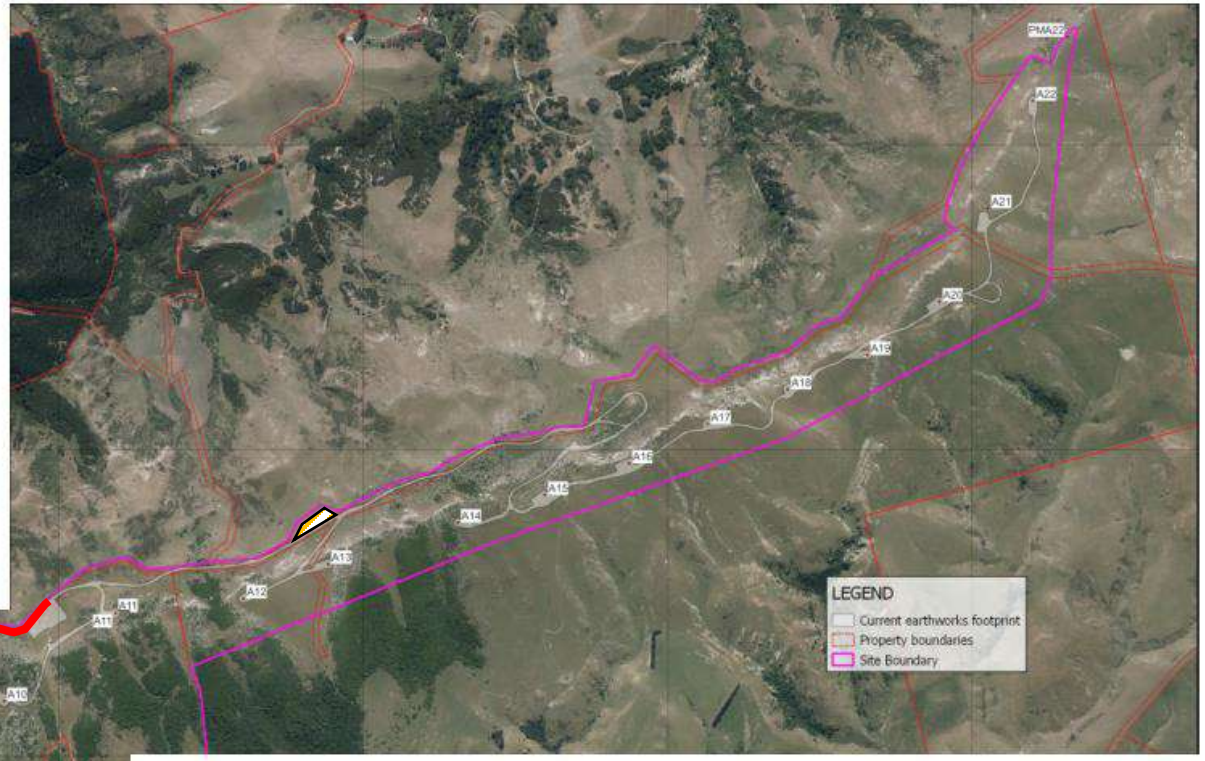

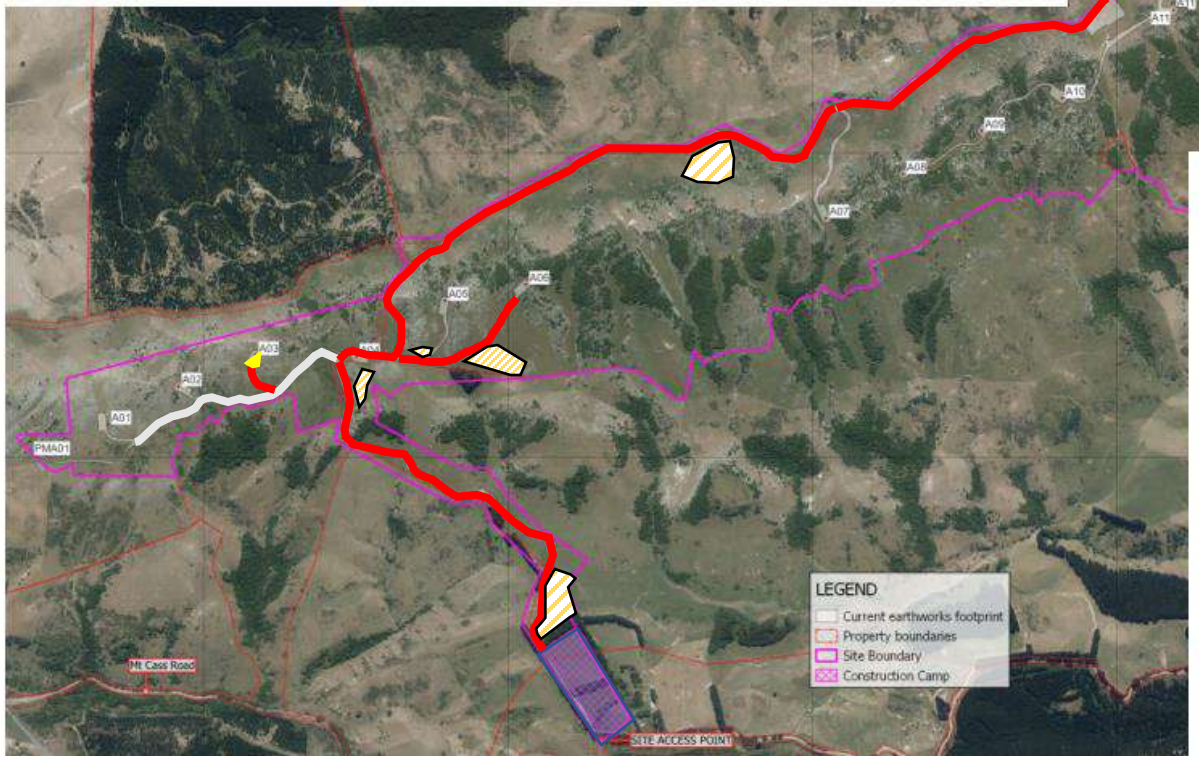

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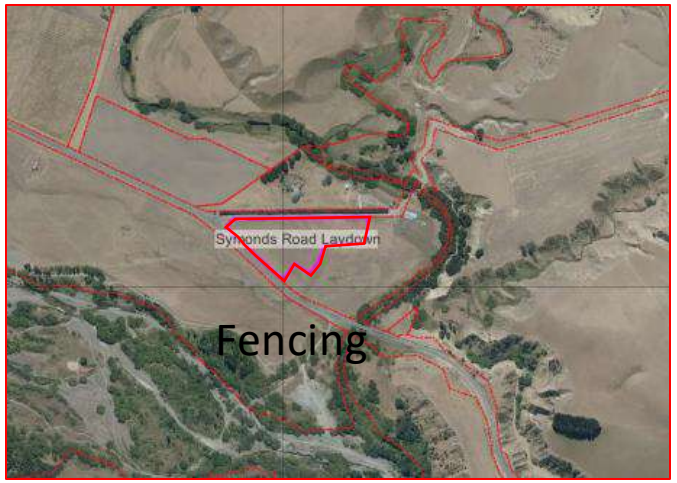

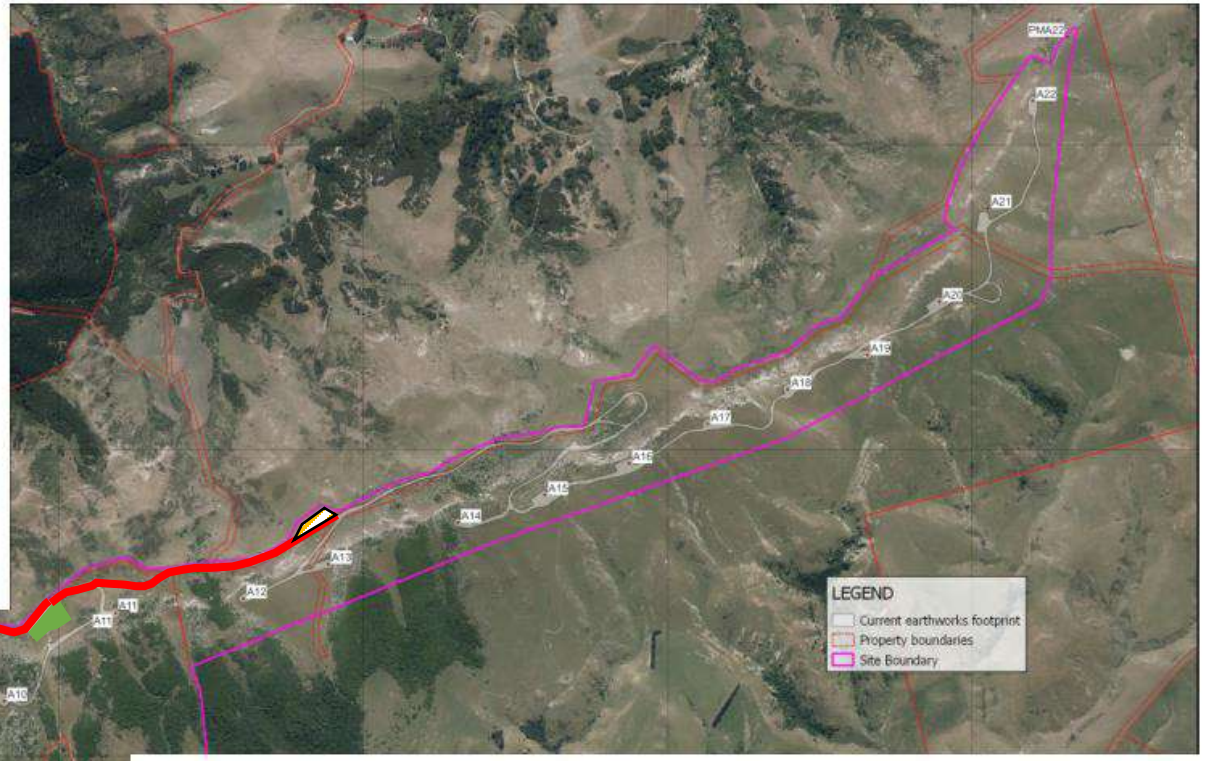

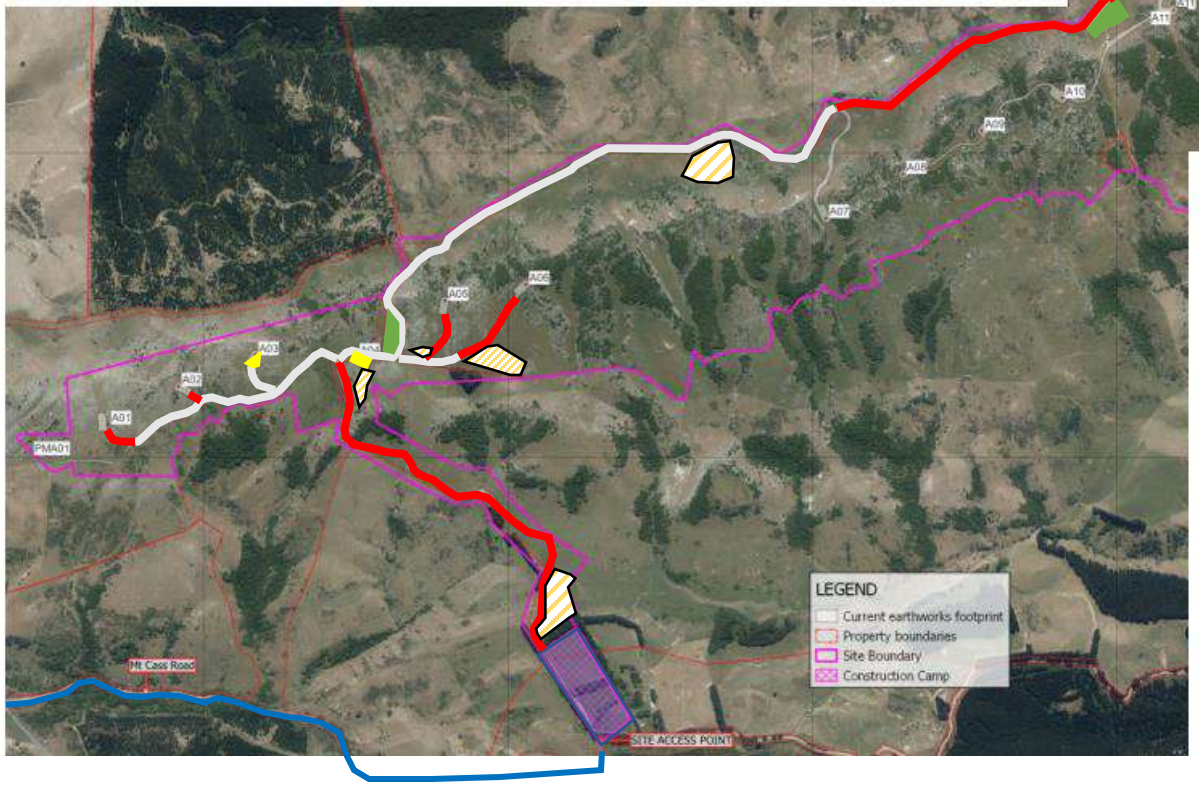

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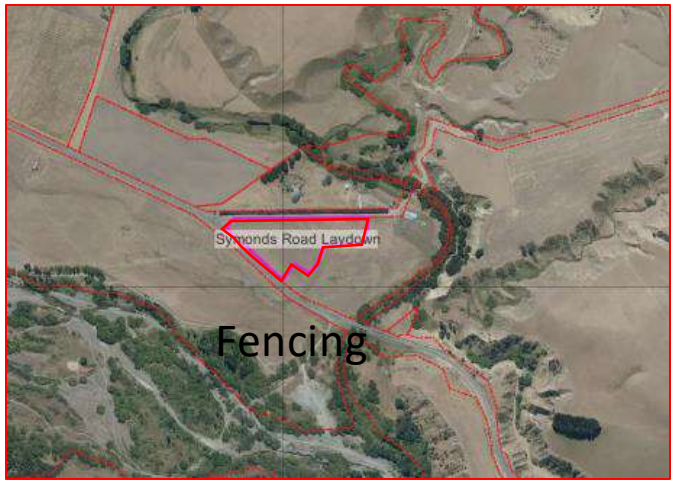

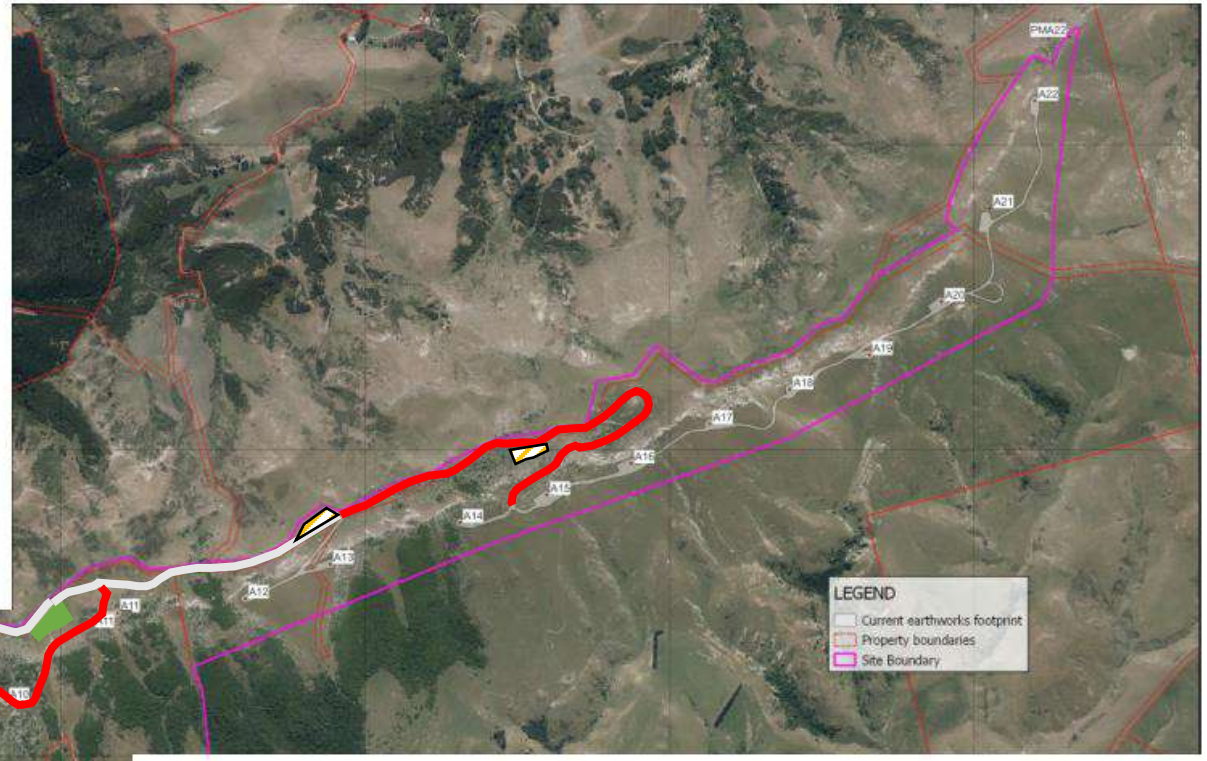

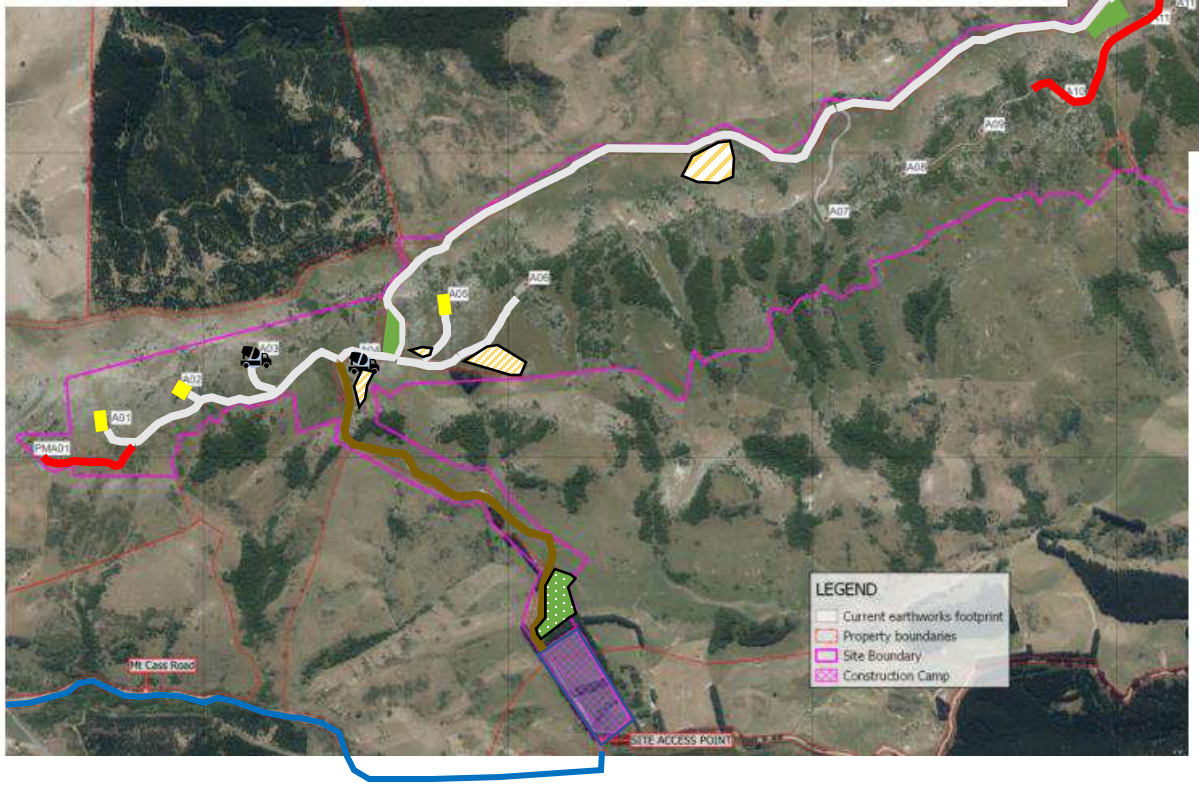

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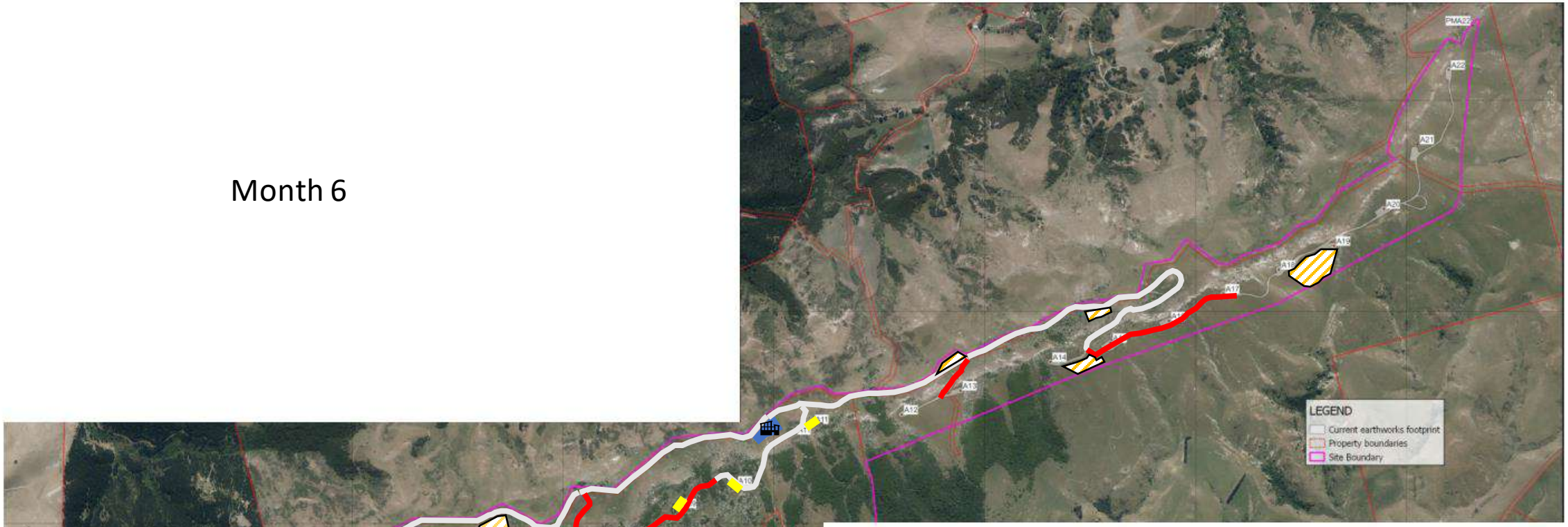

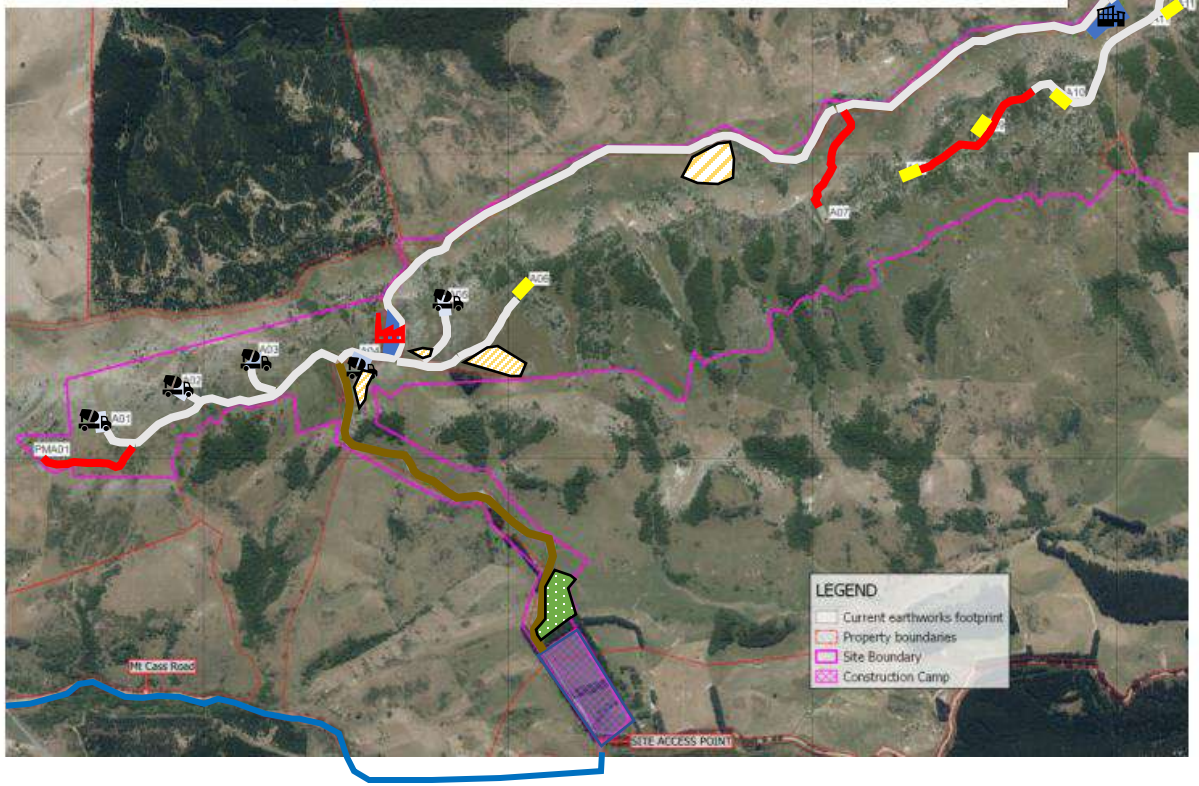

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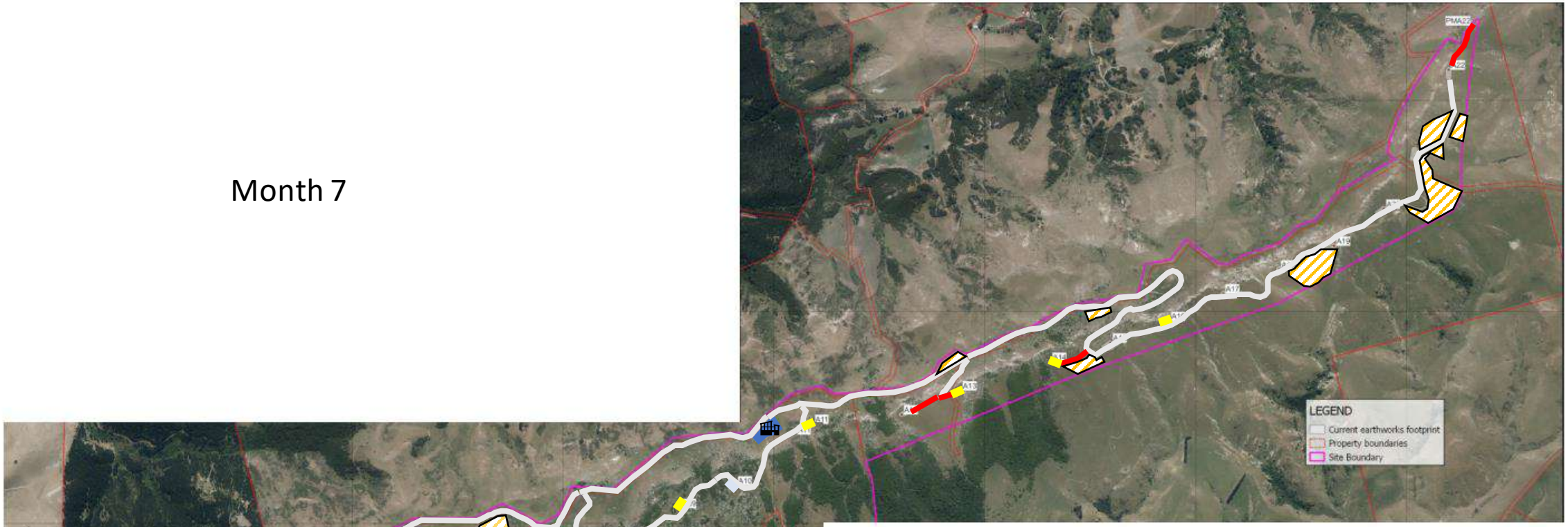

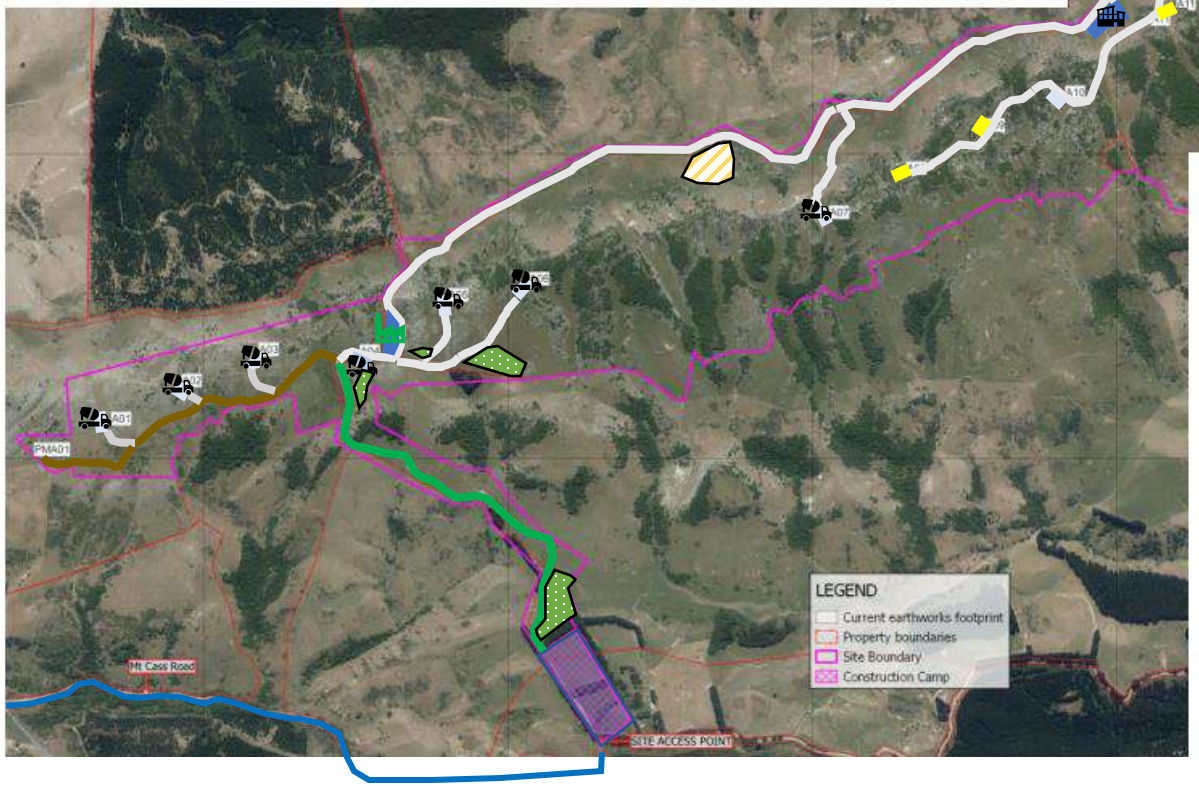

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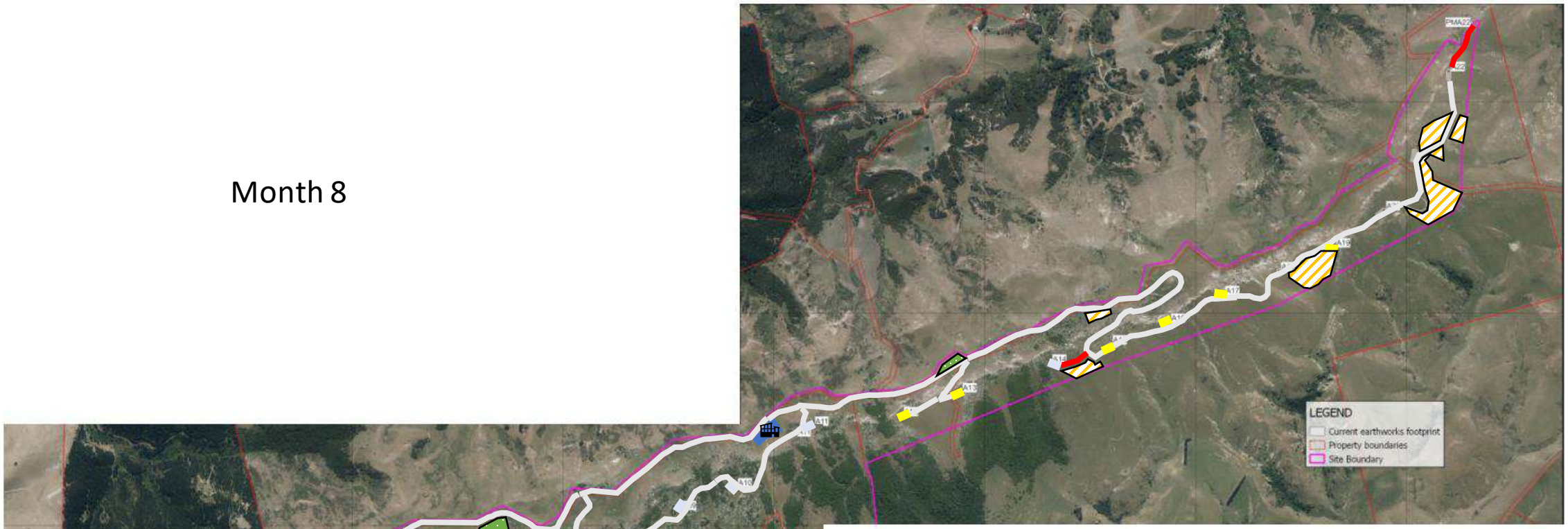

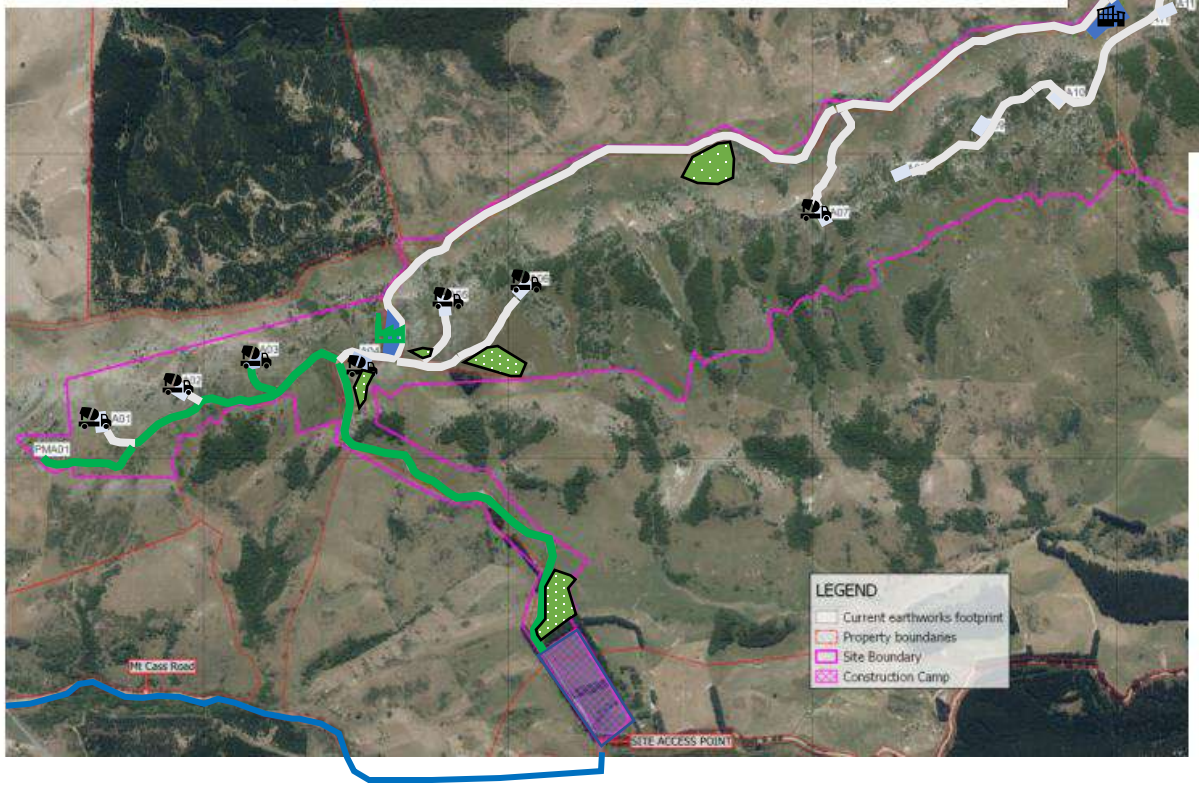

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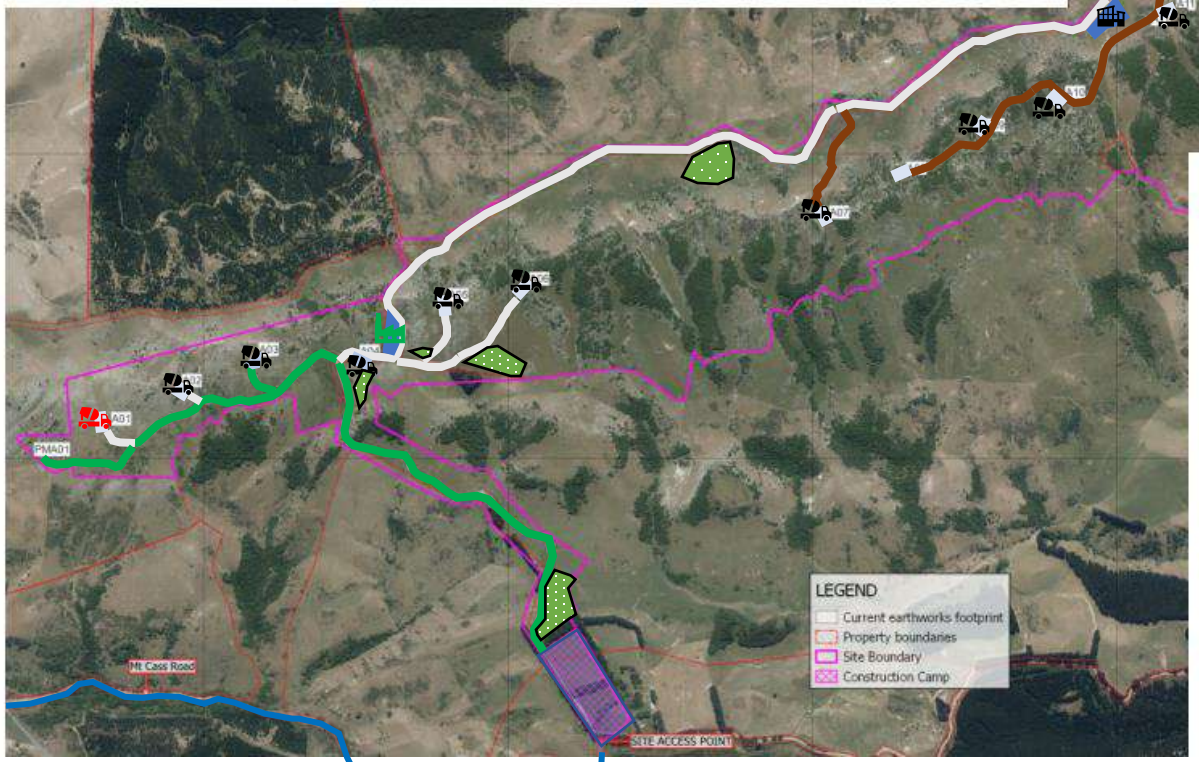

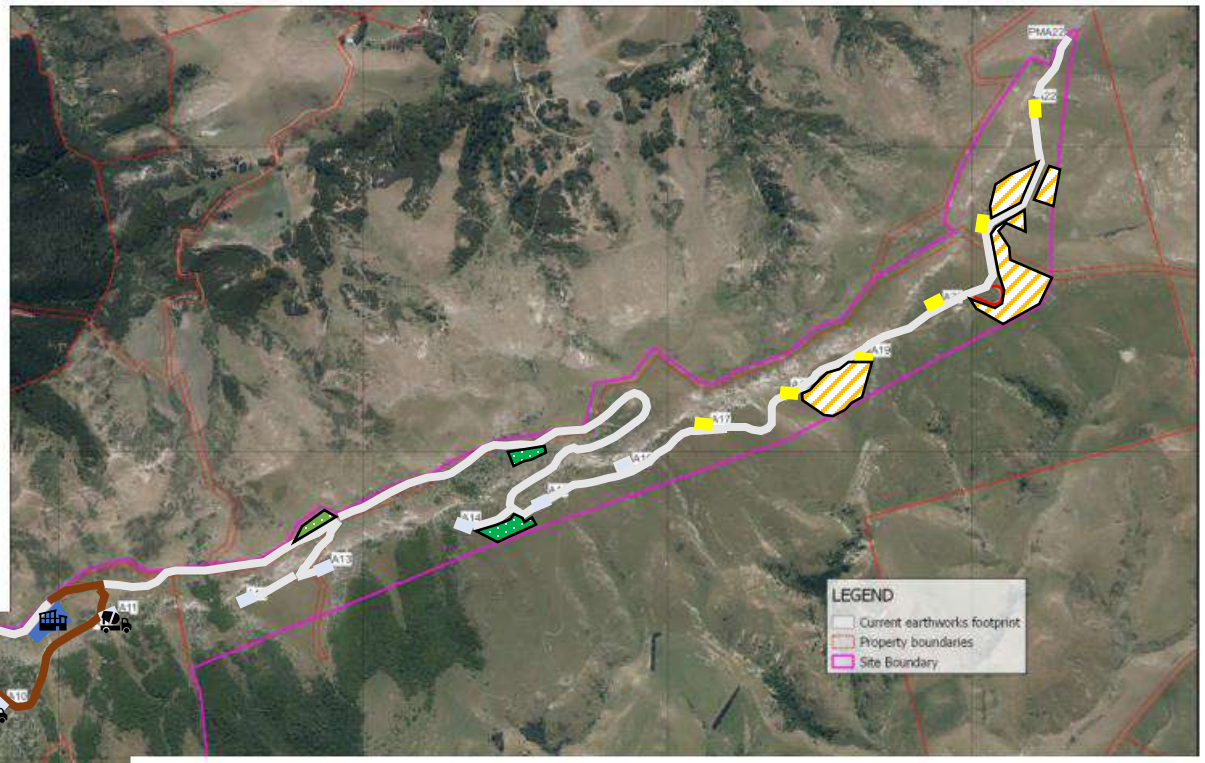

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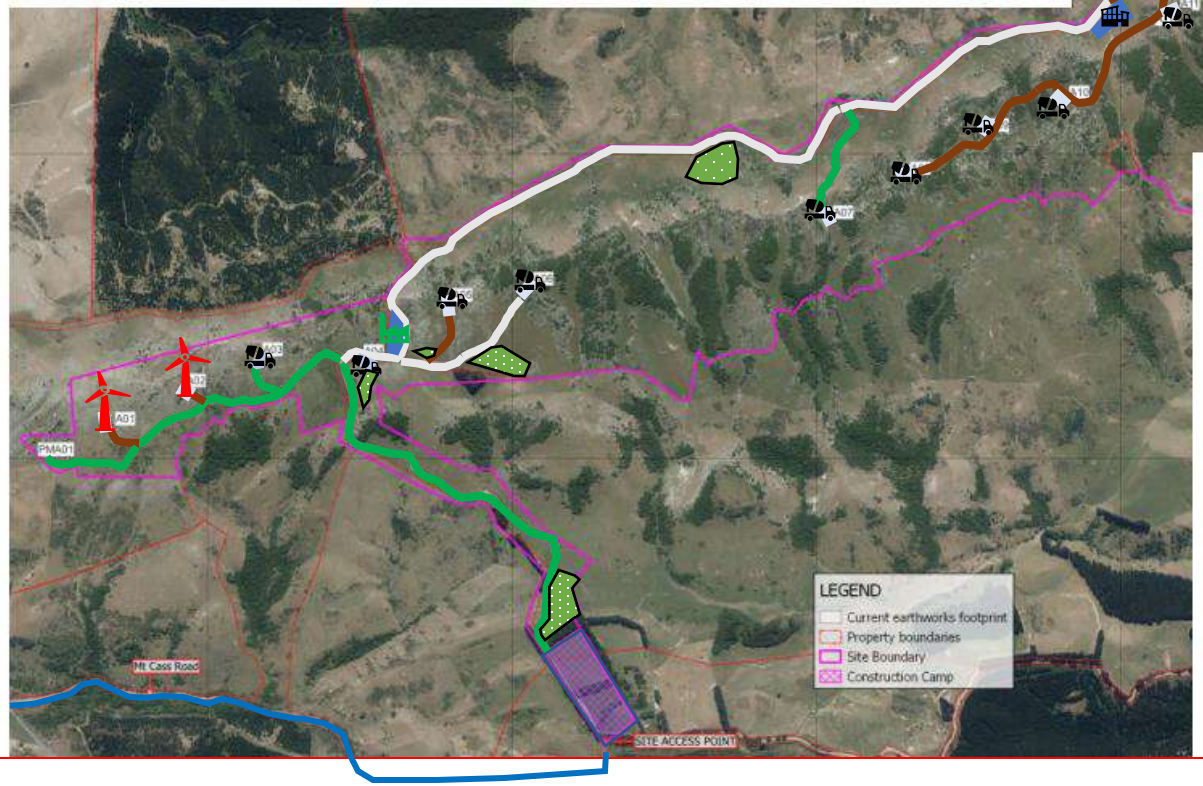

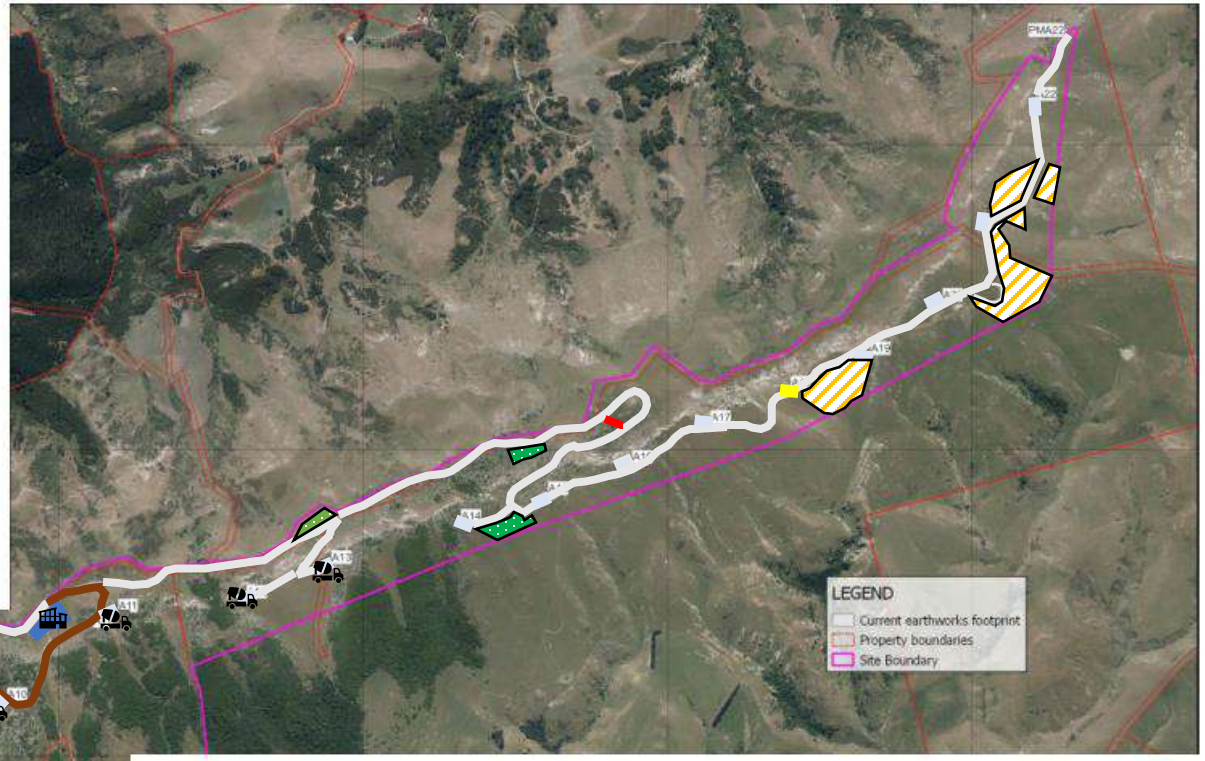

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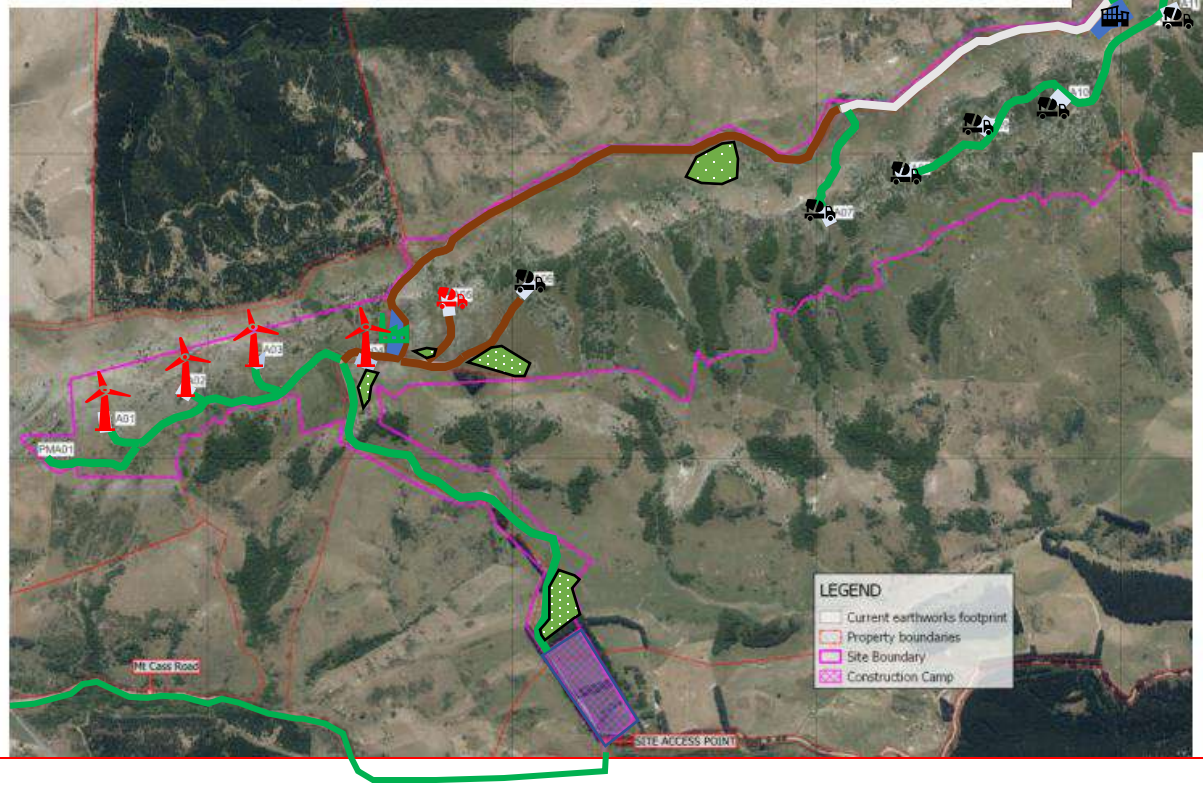

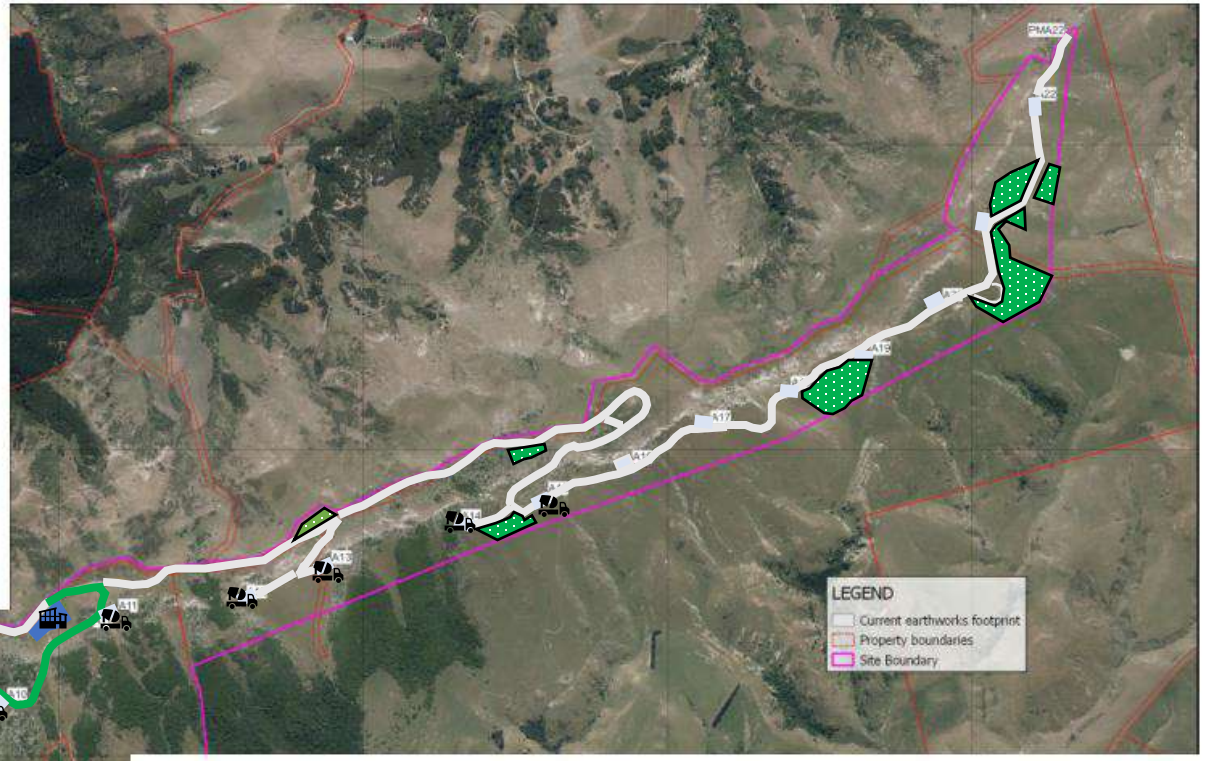

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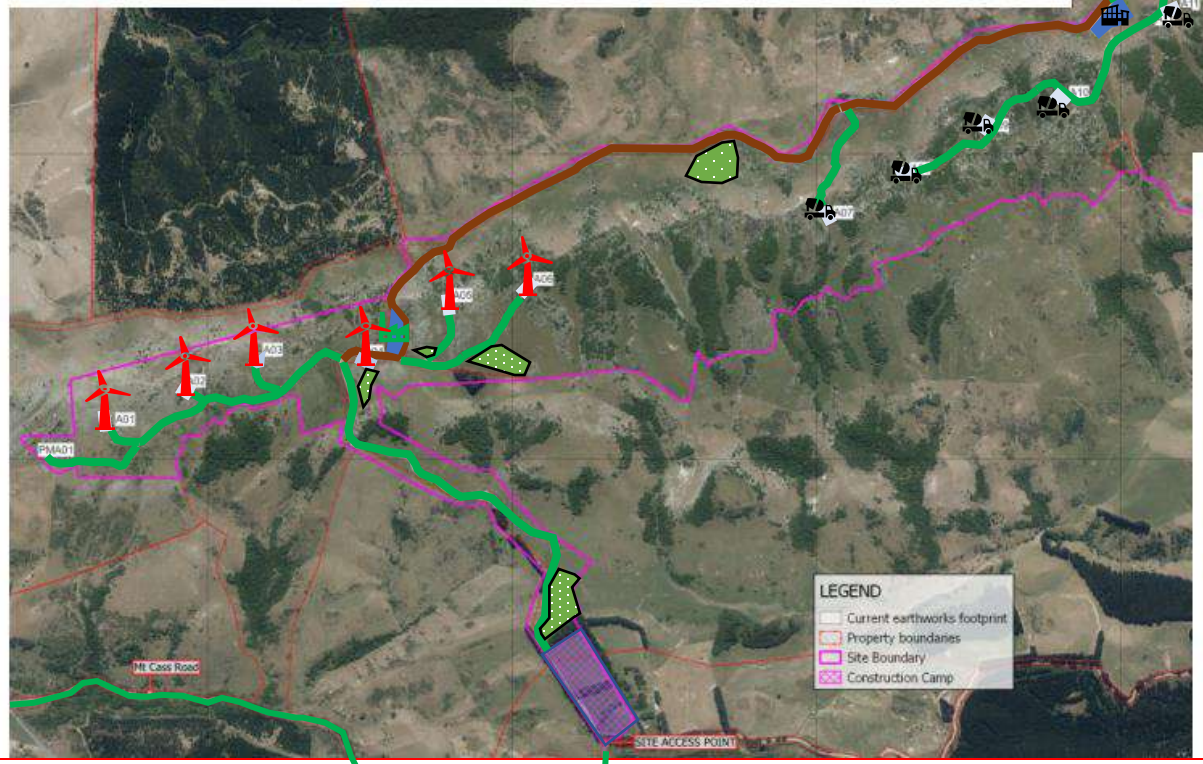

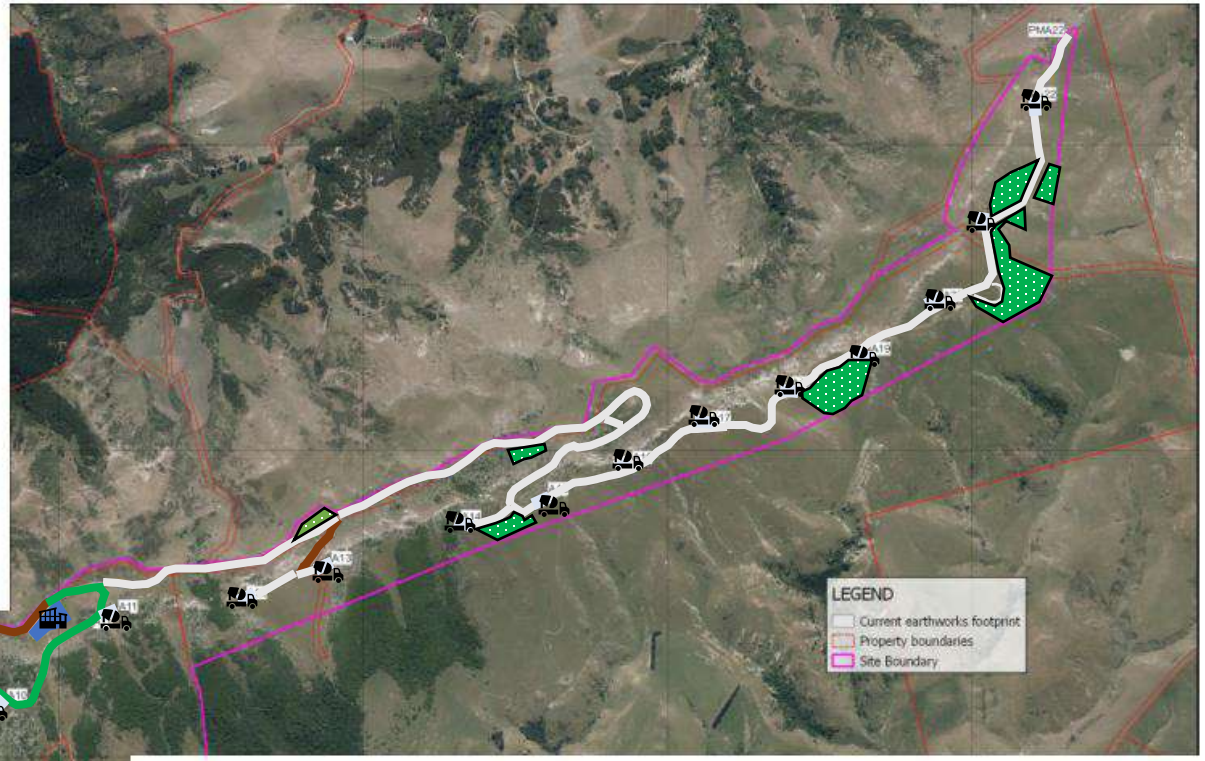

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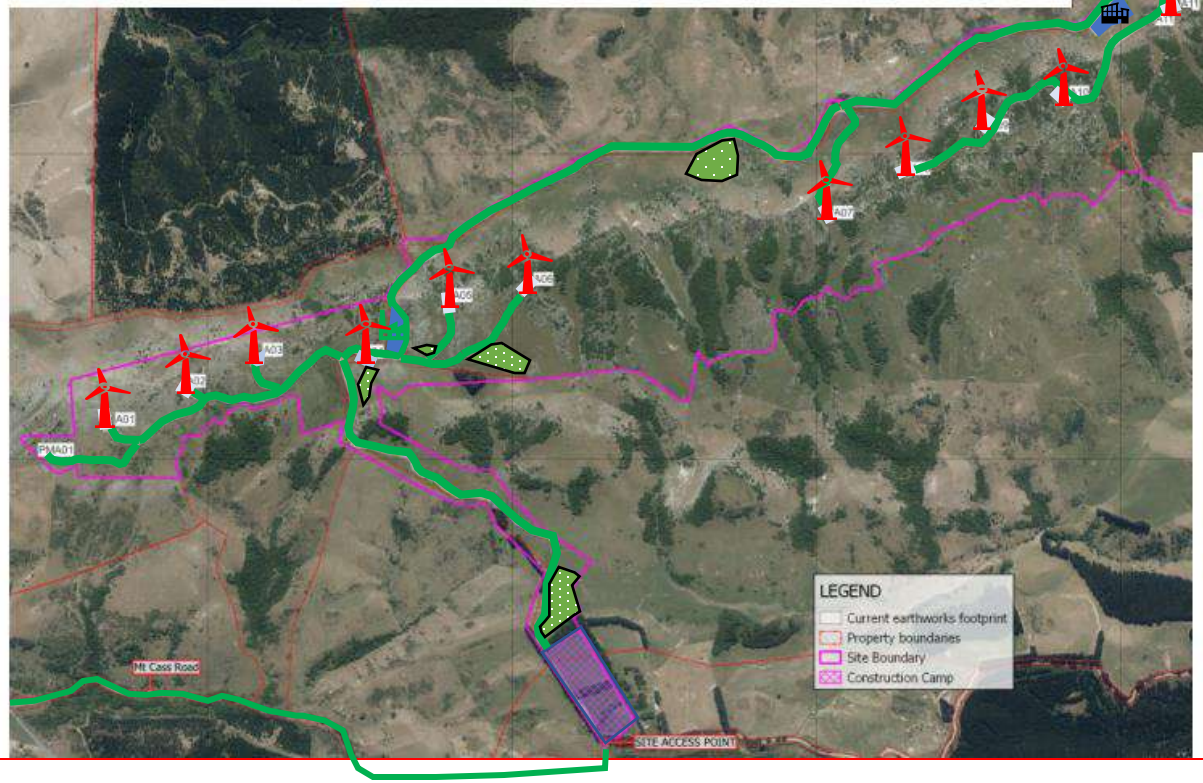
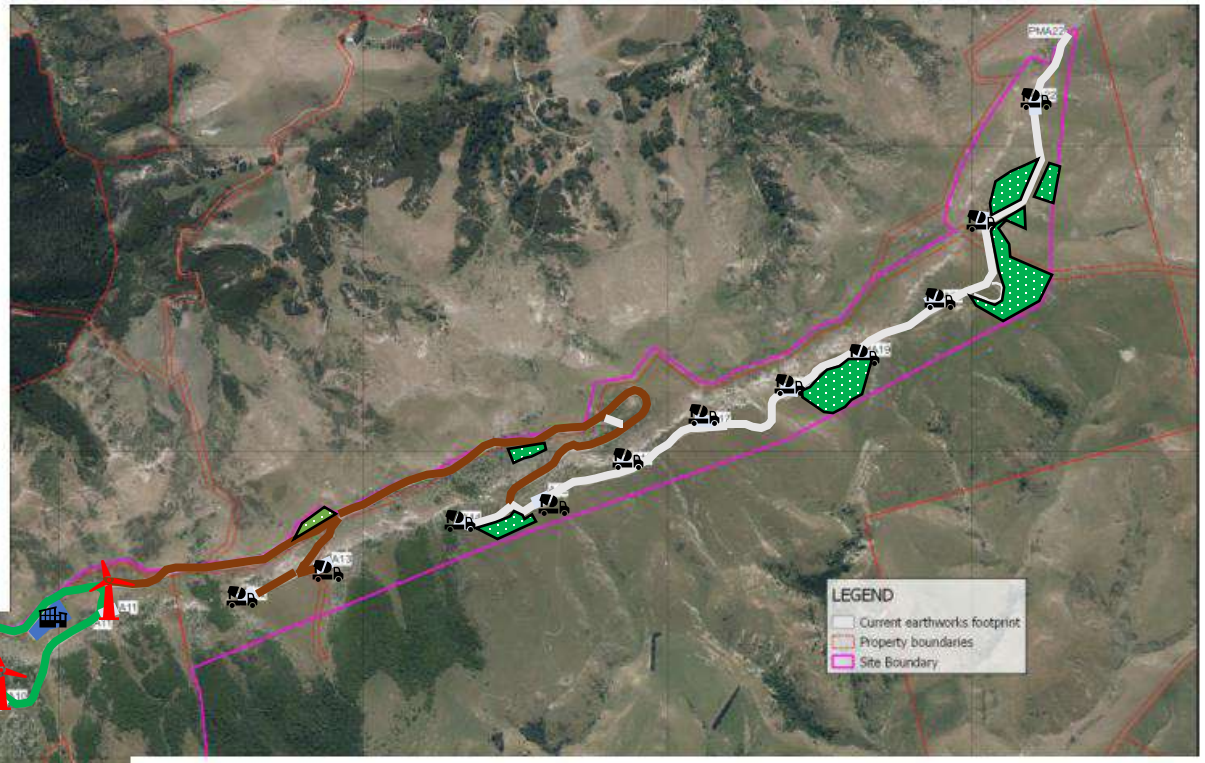
Month 13





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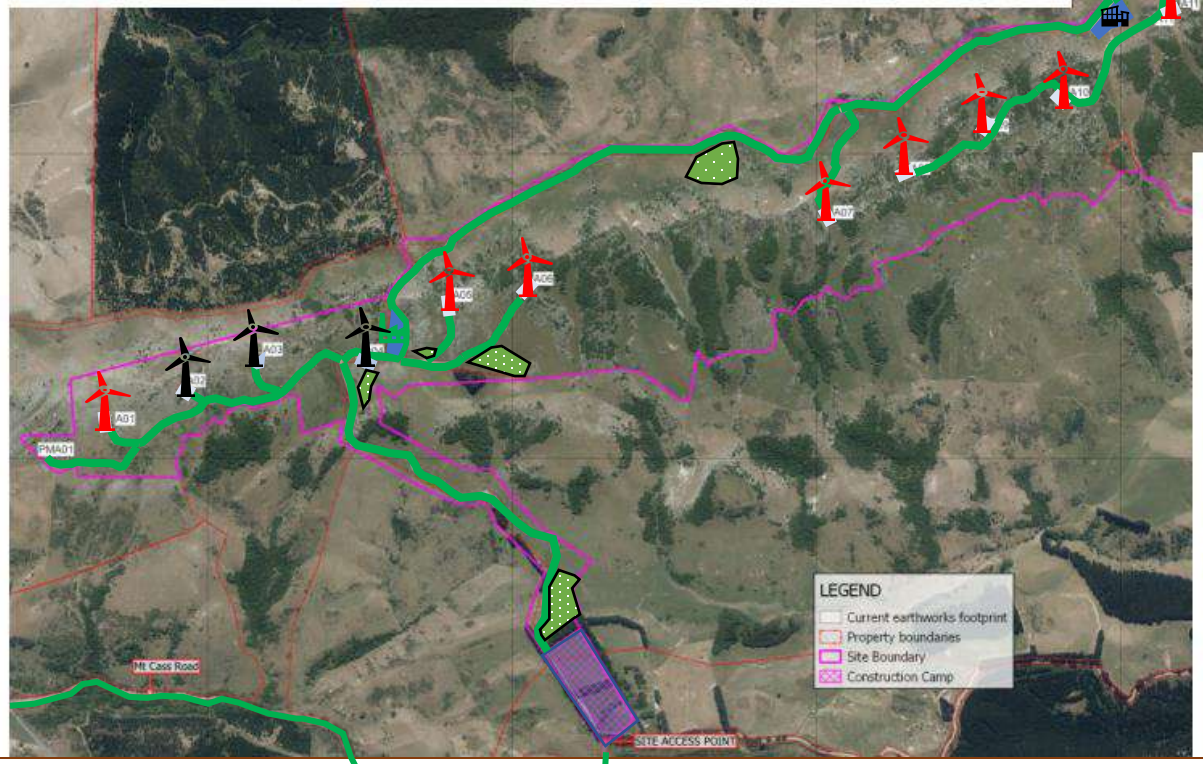
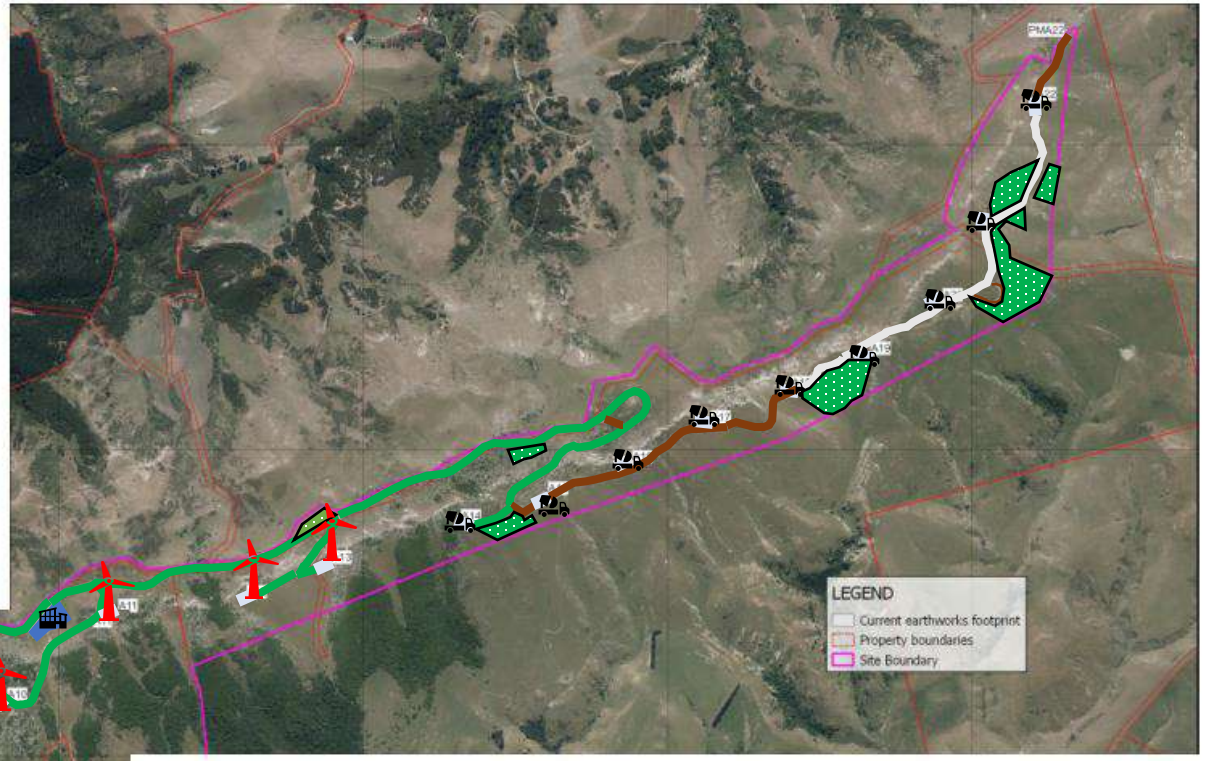
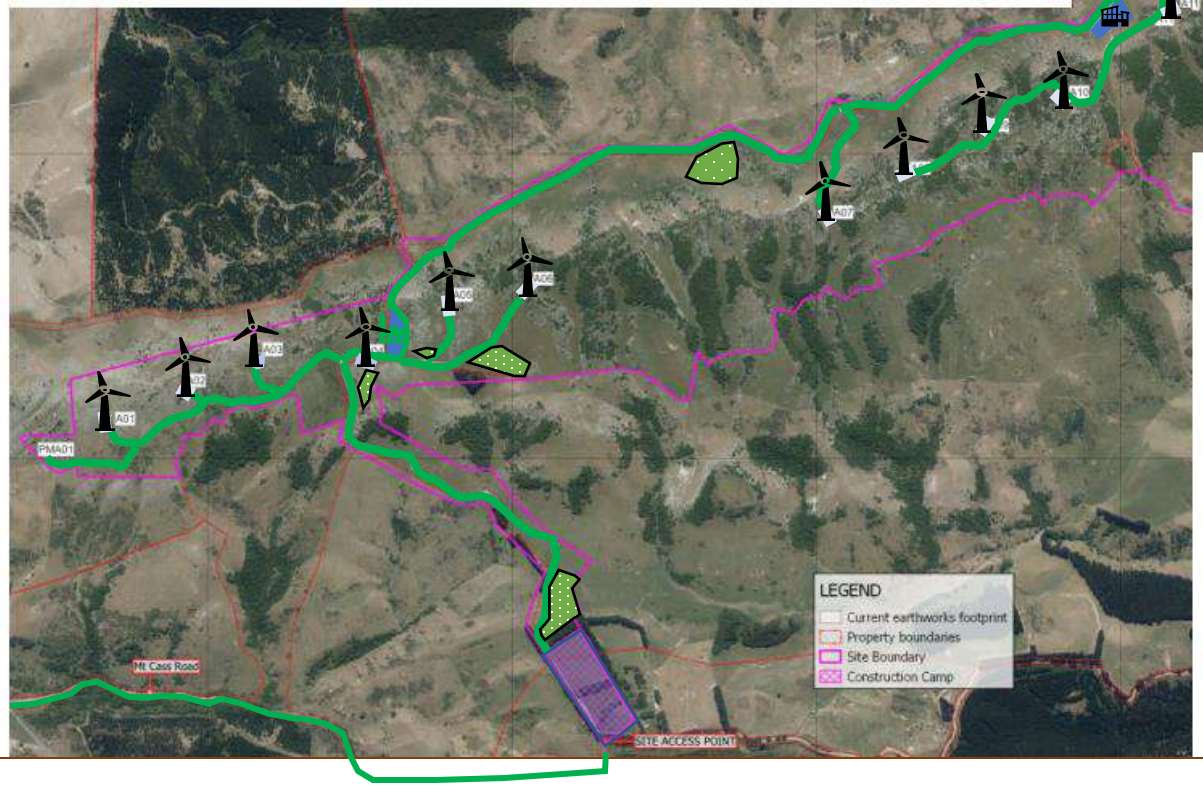
Month 14

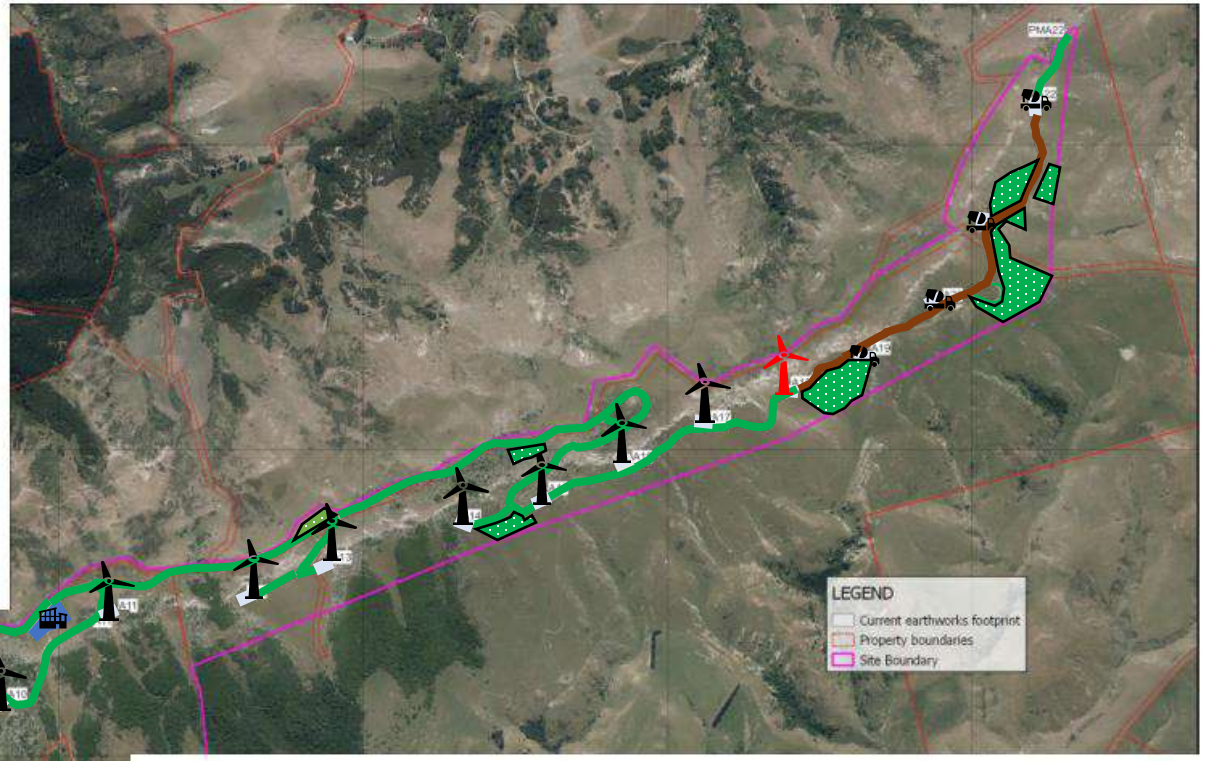




- Access Complete
- Track Earthworks
- Pavement
- Trenching / Temp Running Surface
- Tower Platform EW
- Tower Platform Complete
- Concrete Batching Plant
- O&M Building
- Site Office & Laydown
- Disposal Site Complete
- Disposal Site in use
- WTG - Construction
- WTG - Complete
- WTG Foundation – Construction
- WTG Foundation - Complete

Month 15





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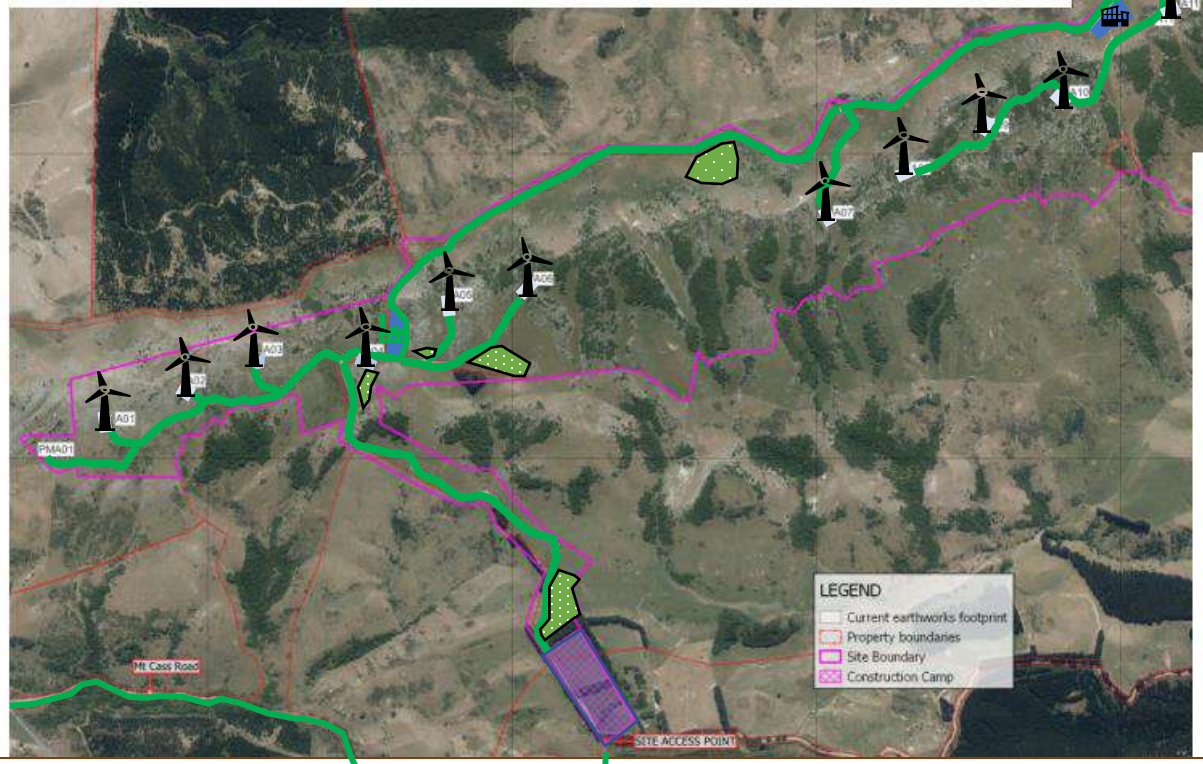
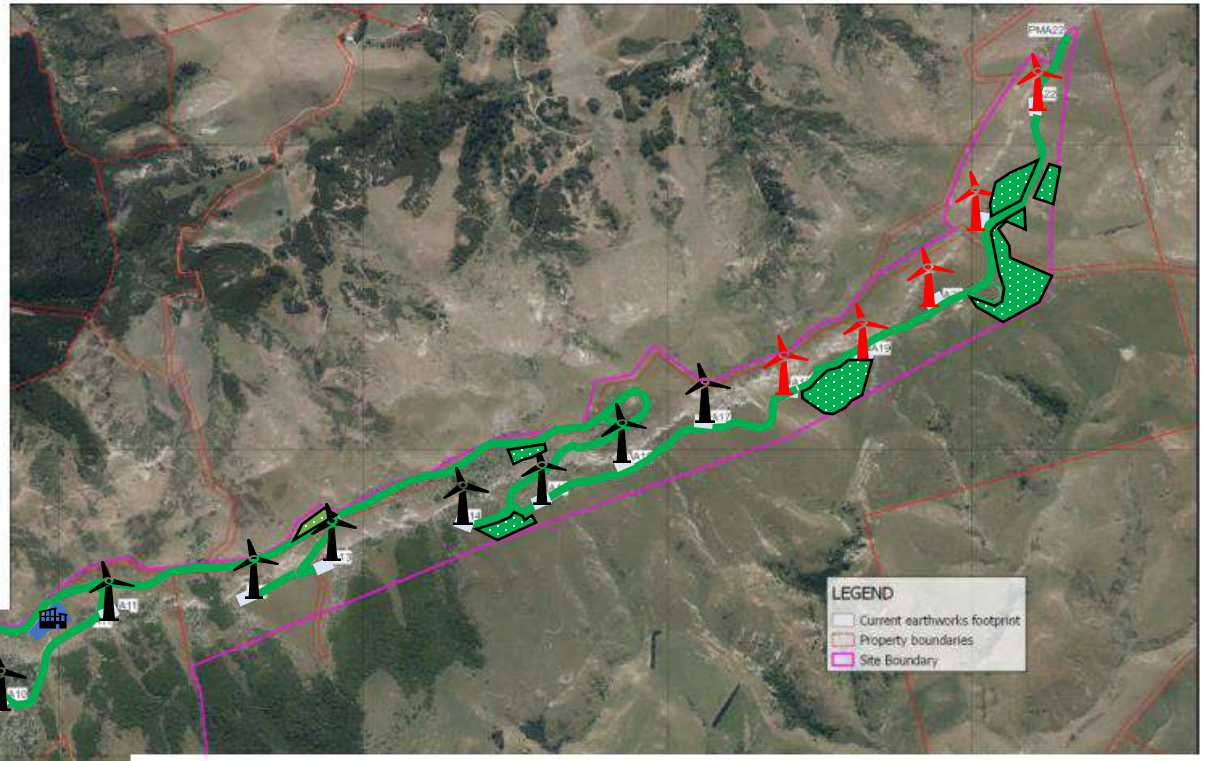
Month 16





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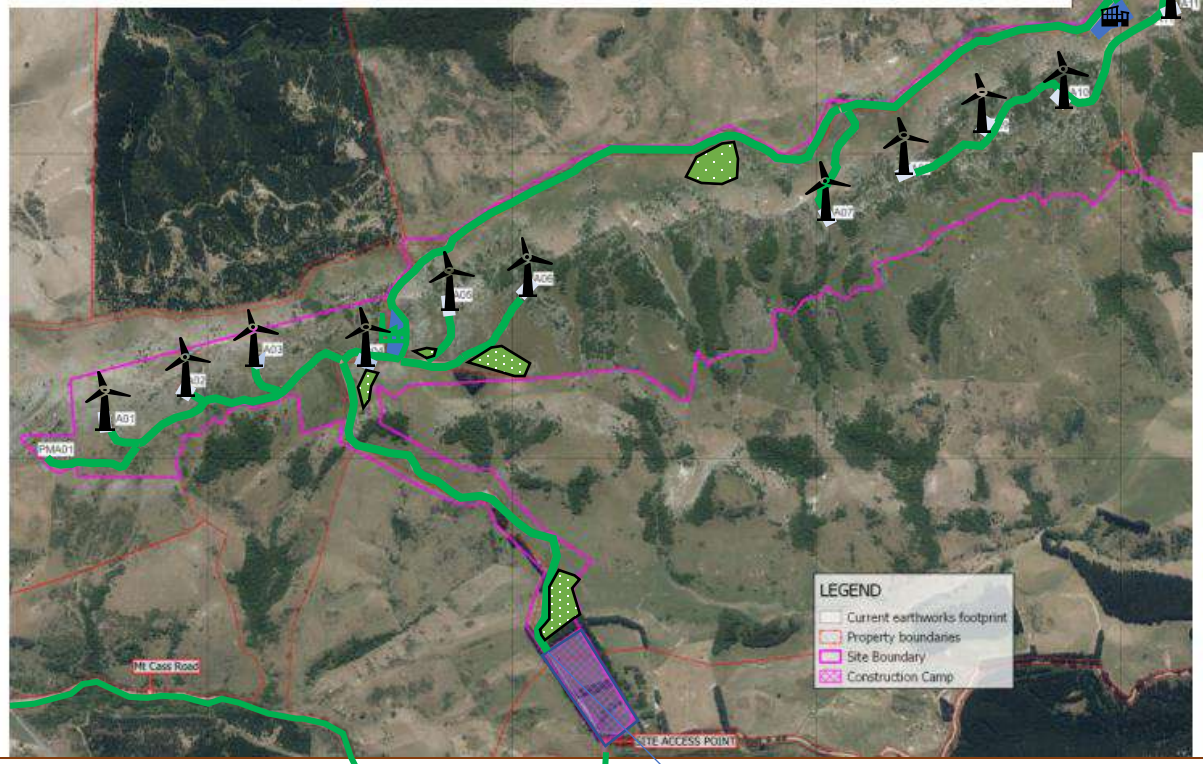
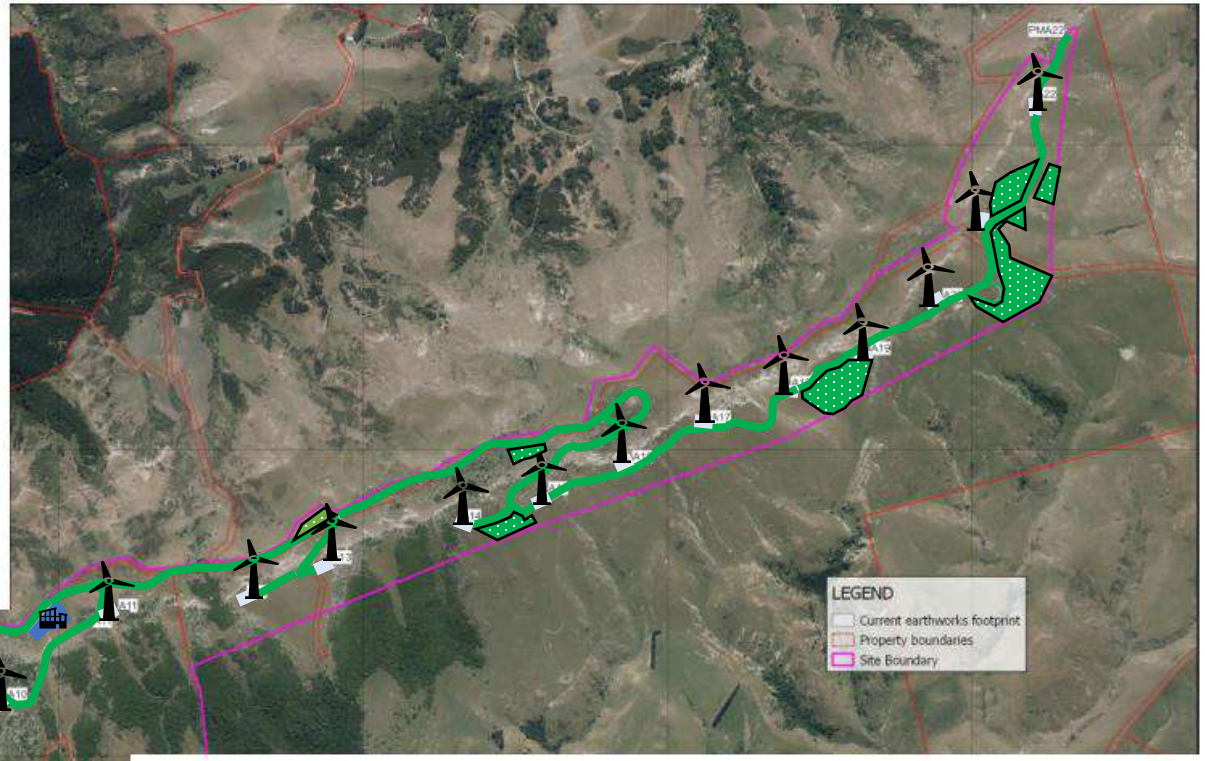
Month 17





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Appendix C:

Consent Conditions Compliance Matrix

HDC		A3	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10		
Clause	Summary of Condition	CMP	ESCP	DMP	HAZSUB	ARCH	NMP	TMP	FMP	WMP	Eco MP	LMP	EMP	N/A to CMP
1	Build the Mt Cass wind farm to one of three layouts - restricted by tip height and number of turbines.													Y
2	Advise HDC of turbine choice at least 6 months prior to construction.													Y
3	N/A – R33 turbine conditions.													Y
4	N/A – R60 turbine conditions.													Y
5	If R90 turbine layout is selected, constructed layout, construction and operation shall be in accordance with plan 4755.1 and 4755.2 Rev B (4 May 2021). Aspects affected: • Location of roads and carparks • Location and extent of construction laydown areas (excluding turbine platforms) • Extent of area disturbed by earthworks • Location and extent of spoil disposal areas • Location of the exclusion zone.													Y
6	No construction activities within the exclusion zones identified in condition 3, 4 (Golder Associate plans) and 5 (MCWF plans) except for fencing, the walking track (condition 143) and stabilisation of rocks.										Y			
7	Boundaries of exclusion zones identified on Golder Associates plans CG161.3-166.3 dated 20 December 2010 (being parts of those exclusion zones within 10 metres of proposed activities) shall be physically identified and marked on the ground prior to any construction activities taking place within 50 metres of those areas.										Y			
8	Micrositing is allowed within 140m radius of nominated positions in conditions 3, 4 (Golder Associate plans) and 5 (MCWF plans), shall not be in exclusion areas shown in CG161.3 and 164.3, and shall aim to avoid, or secondly, minimise effects on biodiversity.										Y			
9	Micrositing is permitted provided that it does not exceed clearance limits in condition 13.										Y			
10	In undertaking the micrositing process engage suitably qualified and experienced ecologist and suitably qualified and experienced expert in karst landscape to advise on placement and loc ation of turbines (approved by HDC and in consultation with DoC).										Y			
11	Take advice of ecologist and karst expert when micrositing. If not able to follow advice, then reasons must be reported to Council.										Y			
12	Any additional limestone or vegetation that is able to be avoided through micrositing must be identified and marked prior to construction activities in that location.										Y			
13	Vegetation clearance and exposed limestone disturbance as a result of construction activities including pre-construction geotechnical investigations (excluding effects from fencing and the construction of the walking track under condition 143) must not exceed specified limits.										Y			
14	Minimise effects of fencing and walking track covered in condition 143 in the exclusion zones by: • Finalising detailed alignment by providing outline plan to be certified by HDC Environmental Services Manager at least one month prior to any construction occurring. • Hand cutting of indigenous vegetation. • Avoiding use of wheeled mechanical equipment or tracked vehicles on in-situ limestone pavement. • Otherwise minimizing disturbance to limestone surfaces. The maximum extent of vegetation clearance for the construction of the walking track shall not exceed 0.25ha of indigenous shrubland and 0.05 ha of indigenous forest.										Y			
15	Concrete batching to be located on area identified on plan 4755.1 (10 April 2019) referred to in conditions 3, 4 (Golder Associate plans) and 5 (MCWF plans).	Y												
16	Requirements for substation construction.													Y
														Y
17	Turbine finish.													Y
18	N/A - Turbine Maintenance.													Y
19	Reporting during Construction: • Consent holder to confirm to HDC total extent of clearance fortnightly during construction.	Y									Y	Y		
20	Reporting Post Construction: • On completion of works provide as built plans to HDC. • Provide independently verified written confirmation that maximum limits of shrubland and forest clearance and disturbance of limestone landforms are within condition 13 limits and condition 12 areas have been avoided.	Y									Y	Y		
21	N/A - Lapsing of the Consent.													Y
22	General requirements for management plans.	Y												
22a	Provide a draft environmental management plan (condition 66) to HDC Environmental Services Manager within 6 months of date of grant of consent.													Y
23	At least 3 months prior to undertaking any consent activities, provide a completed Environmental Management Plan to HDC Manager Environmental Services for certification.													Y
24	Outcome of CMP and EMP review by HDC. CMP provided to HDC for review at least 30 working days prior to any activities.	Y												
25	All activities shall be undertaken in accordance with latest versions of management plans.	Y												
26	Construction Management Plan annual review.	Y												
27	Environmental Management Plan three-yearly review.													Y
28	Requirements for consent review and certification of changes.	Y												
29	Management plans to be publicly available.	Y												
30	Construction management plan to apply to all works up to and including completion of commissioning and rehabilitation of construction activities.	Y												
31	Objectives of the Construction Management Plan	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
32	Contents of Construction Management Plan.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
33	Pre-construction Plan Lodgement to HDC Environmental Services Manager at least 20 working days prior to construction works commencing incorporating the following elements: (a) Turbine layout (b) Engineering plan for roads (c) Results of prior drilling and ground penetrating radar traverses to ascertain subsurface cavities (d) Relation of construction works to karst features										Y			
34	Notification of commencement of construction at least five days prior to work commencing.	Y												
35	No offensive dispersal of dust beyond site boundary.			Y										
36	Concrete batching plant to be removed within 6 months of construction completion.											Y		
37	Undertake Erosion and Sediment control measures.		Y											
38	Erosion and Sediment control measures to be installed, operated & maintained.		Y											
39	Design storm for detention features for runoff and sediment control.		Y											
40	Sufficient provisions in the construction contract to allow accurate tenders for erosion and sediment control measures.		Y											Y
41	Groundwater monitoring: Prior to construction activities commencing the Consent Holder shall undertake water quality monitoring at the main springs and at the Smothering Gully stream, for a period sufficient to establish baseline conditions to the satisfaction of Hurunui District Council - at least two winter wet season unless more frequent storms. a. Aquatic indicator species; and b. Suspended and dissolved water quality measures, including hydrocarbon indicators.												Y	
42	Groundwater monitoring - repeat monitoring annually	Y											Y	
43	Groundwater monitoring: Results of monitoring to be forwarded to HDC within 5 working days of the analytical results being available.	Y											Y	
44	Audit the design of Erosion and Sediment Control measures against the Construction Management Plan.		Y											
45	Treatment of Identified Limestone Pavement Areas: Limestone pavement areas marked on Golder Associates plan CG161.3 and CG163.3.											Y		
46	Partial rehabilitation of Limestone pavement areas identified in condition 45.											Y		
47	N/A - Condition not relevant to R90 layout. If a road is constructed at NZMG coordinates 2496126E, 5792235N or thereabouts…													Y
48	Road running surface provided from site material.	Y												
49	On-site parking to be provided.	Y												
50	Use local materials for earth fill.	Y												
51	Protect road surface with basecourse.		Y											
52	Prevent scour from temporary discharge diversion channels.		Y											
53	Turbine platforms shall be designed to provide for erosion and sediment control.		Y											
54	Location and management of spoil disposal sites.		Y											
55	Specifics of spoil disposal design, construction & management.		Y											
56	Divert surface water around spoil disposal.		Y											
57	Stabilisation and planting of spoil sites.		Y											
58	Erosion & sediment control of long-term (4 consecutive weeks) topsoil stockpiles.		Y											
59	Uphill bunding of all topsoil stockpiles.		Y											
60	Engage an ecologist to undertake vegetation survey in construction areas prior to undertaking construction activities.										Y		Y	
61	Temporary pre-construction site rehabilitation.											Y		
62	Confirm to HDC Environmental Services Manager in writing within 3 months of completion of construction that all relevant construction conditions have been complied with.	Y												
63	Traffic management during construction to be provided for in the Construction Management Plan.							Y						
64	Road vesting requirements (if required).							Y						
65	Deposit of debris on public roads during construction is to be avoided.							Y						
66	Environmental management plan to be prepared to ensure compliance with conditions of consent in areas of: a. Avifauna management conditions b. Herpetofauna management conditions c. Weed control conditions d. Habitat enhancement and pest control conditions												Y	
67	Annual report be provided to HDC by the anniversary of commencement of this consent.													Y
68	Avifauna monitoring and management.										Y			
69	Avian ecologist to be engaged to undertake pre-construction survey of avifauna populations and species abundance at site.										Y			
70	Monitoring requirements for avifauna survey.												Y	
71	Post-commissioning bird monitoring. Annual survey for a minimum of two years. Mortality monitoring once per season for a min of two years.													Y
72	Report to HDC of any injury or mortality of Kereru, NZ falcon or NZ pipit through interaction with windfarm infrastructure.												Y	
73	Falcon monitoring.												Y	
74	Design of avifauna monitoring programme.												Y	
75	Engagement of avifauna expert to prepare avifauna monitoring and management section of Environmental Management Plan.												Y	
76	Avifauna provisions in EMP.												Y	
77	Herpetofauna (Lizard) management.										Y		Y	

78	Herpetofauna section of the EMP.												Y	
79	Requirements of herpetofauna management section of EMP.												Y	
80	Register a covenant over Mt Cass Conservation Management Area no later than 3 months after commissioning the wind farm.												Y	
81	Conservation Management Area to comply with consent conditions.												Y	
82	Weed monitoring and control programme within Mt Cass Conservation Area and other areas subject to disturbance by the wind farm.									Y			Y	
83	Ecologist to prepare weed monitoring and control plan as part of Environmental Management Plan in consultation with DoC.									Y			Y	
84	Weed monitoring detail.									Y			Y	
85	Habitat enhancement and pest control programme.												Y	
86	Habitat enhancement and pest control within Mt Cass conservation area and seasonal pest control in the remainder of the windfarm.												Y	
87	Restoration Ecologist to prepare habitat enhancement and pest control section of Environmental Management Plan.												Y	
88	Five year plan for habitat enhancement and pest control.												Y	
89	Research and monitoring for success of habitat enhancement and pest control.												Y	
90	Habitat Enhancement and Pest Control section of EMP shall include measures for threatened plant species management.												Y	
91	Performance indicators for success of the EMP												Y	
92	Silver tussock rehabilitation in areas of temporary disturbance for pre-construction.										Y	Y		
93	Silver tussock replacement of equivalent areas if permanently removed.											Y		
94	Surplus limestone disposal locations as indicated in conditions 3 and 4 (Golder Associates) and 5 (MCWF).											Y		
95	Surface finishing of spoil disposal areas.		Y									Y		
96	Uphill cut faces and edges of Amuri limestone finishes to be irregular.											Y		
97	In condition 96, avoid straight line interfaces between cut faces and original surfaces.											Y		
98	Amuri limestone cuts to emulate naturally occurring patterns.											Y		
99	The Northern Terrace Rd and associated ridge road/ramps cut material disposal, material shall not be side cast down slope but shall be removed from the work area and disposed of in disposal sites indicated on Golder Associates Plans CG151.4-152.4 and Mt Cass Wind Farm plans 4755.1 and 4755.2 Rev B dated 4 May 2021.		Y									Y		
100	Mitigation measures for outside treatment of roads in condition 99.											Y		
101	Relocation of limestone boulders.											Y		
102	Development of landscape pattern book.											Y		
103	Form a landscape panel and have that panel available during earthworks - one nominated by HDC.											Y		
104	The landscape expert panel shall liaise with geomorphological, geotechnical and ecological experts as necessary.											Y		
105	Trial of limestone treatment within 3 months of commencement of consent.											Y		
106	Methods for trialling limestone treatment.											Y		
107	Notification of remediation method for Amuri limestone.											Y		
108	Rehabilitation of cuts and fills other than limestone.											Y		
109	Locations for the establishment of woody plants and silver tussock within the wind farm site for visual mitigation.											Y		
110	Visual mitigation and remediation plantings to reflect natural patterns as illustrated in landscape pattern book in condition 102.											Y		
111	The use of plants for mitigation and remediation of visual and landscape effects associated with cut and fill excavations.											Y		
112	Location and bunding of contaminant storage.				Y									
113	Site refuelling & oil spill contingency plan submitted to HDC.				Y									
114	Machinery and plant maintenance requirements to avoid leakage.				Y									
115	Site spill kits.				Y									
116	Removal of contaminants at end of construction process.				Y									
117	Hazardous substances to be stored in accordance with HSNO Act.				Y									
118	Transformer containment requirements.				Y									
119	Fire Management Plan.								Y					
120	Fire Management Plan shall be available.								Y					
121	Minimum requirements of the Fire Management Plan.								Y					
122	Accidental discovery of archaeological remains protocol.					Y								
123	Offer to enter into discovery protocol for Wāhi Tapu, Wāhi Taonga and Urupā with Te Runanga o Ngāi Tahu and Te					Y								
124	The consent holder shall comply with any accidental discovery protocol entered into under condition 123.					Y								
125	Notification to Te Runanga o Ngāi Tahu, HPT and Te Ngāi Tūāhuriri Runanga at least 10 days prior to earthworks commencing.					Y								
126	Engage with Waitaha prior to commencing construction.					Y								
127	The Site Cultural Sensitivity Protocol prepared after the site visits in condition 126 shall be included in the Construction Management Plan.					Y								
128	Accidental Discovery Protocol – Waitaha.					Y								
129	Definitions for Noise conditions.						Y							
130	Construction Noise shall comply with NZS 6803:1999.						Y							
131	Noise limits for windfarm other than construction activities or turbine operation.													Y
132	Wind farm operational sound levels.													Y
133	Wind farm sound levels apply to the high amenity area at NZMG coordinates 2500630E 5796970N for purposes of NZS6808:2010, as long as a person on the autism spectrum permanently resides at that dwelling.													Y
133a	Acoustic Emissions Report to be provided to HDC Environmental Services Manager prior to commissioning of any turbine.													Y
134	Requirements for assessing compliance with conditions 132 and 133.													Y
134a	Testing for special audible characteristics prior to commissioning.													Y
135	Remedial measures if the wind farm does not comply with noise consent conditions.													Y
136	Assessment of special audible characteristics.													Y
136a	Additional noise monitoring.													Y
137	Installation of cables to avoid Earth Potential Rise interference with existing communications infrastructure.													Y
138	Television interference.													Y
139	If requested by an operator, ensure turbines outside '1st Fresnel zone'.													Y
140	If requested within 12 months of the wind farm becoming operational, investigate reflection/ loss of radio linking service and remedy the loss of service.													Y
141	If requested within 12 months of the wind farm becoming operational, investigate scattering interference/loss of wide area coverage service and remedy loss of service.													Y
142	Visibility of aviation navigational lights on turbines or meteorological masts. Provide Council with copy from CAA within 7 days of receiving such advice.													Y
143	Provision of a public walking track.													Y
144	Public access to the walkway route is to be provided in perpetuity. Cetificate of title within 60 days of construction completion.													Y
145	Access restrictions.													Y
146	Interpretive signage.													Y
147	Community Liaison Group.													
148	Liaison group meetings.													Y
149	Objective of the Liaison Group is to facilitate information flow between the consent holder and the community.													Y
150	Community Liaison Group input into preparation and review of management plans.	Y												
151	The consent holder shall coordinate the community liaison group.													Y
152	The consent holder not in breach if any one of specified parties does not wish to be members of Community Liaison Group or attend any particular meeting.													Y
153	Consent holder to establish and publicise contact details for a liaison officer. Contact log shall be kept & available to HDC on request.	Y												
154	A complaints register shall be kept & made available to the Liaison group & HDC at all reasonable times on request.	Y												
155	Advise HDC of any complaint within 5 days of receipt, and where appropriate, any remedial or corrective actions taken.	Y												
156	Statutory Liaison Protocol to be established with Department of Conservation.										Y			Y
157	DOC site visits during construction.	Y												
158	Purpose of annual meeting with DOC.													Y
159	Peer reviewer to be engaged and approved by the HDC.	Y												
160	Peer reviewer experience.	Y												
161	Annual report to be provided by the peer reviewer.													Y
162	Peer reviewer may engage appropriate experts.													Y
163	HDC annual review of consent conditions.													Y
164	Consent holder to meet costs of review.													Y
165 - 179	Consent holder performance bond requirements. 165 - 179													Y
180 - 184	Wind Farm decommissioning.													Y

Appendix D

B1 Erosion and Sediment Control Plan

Mt Cass Wind Farm
Erosion and Sediment Control Plan

Revision 7 – 23 March 2023

This document has been prepared for the benefit of Mt Cass Wind Farm Ltd (MCWF). No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person. This disclaimer shall apply notwithstanding that the report may be made available to other persons of an application for permission or approval to fulfil a legal requirement.

Revision History

Version	Description	Date	Prepared by	Approved By
Rev 1	Draft	03 Mar 21	HW	SB
Rev 2	Draft	19 Apr 21	HL, SS	SB
Rev 3	IFC	1 Dec 22	BT	MC
Rev 4	MCD Amendments post review comments	22 Dec 22	BT	MC
Rev 5	MCD Amendments post review comments (second round)	14 Feb 23	BT	MC
Rev 6	MCD updated last 4 comments from SEQP	07 Mar 23	DK	MC
Rev 7	Post CLG Review, for HDC submission	22 Mar 23	MC	GG

TABLE OF CONTENTS

1. Introduction

This Erosion and Sediment Control Plan (ESCP) is intended as a general overview of the erosion and sediment control principles, practices that are commonly adopted in ESCP's and Environment Canterbury's Erosion and Sediment Control Toolbox (ESCT). This document outlines industry best practice measures that may be adopted by Mt Cass Wind Farm's (MCWF) Contractors in association with the Mt Cass Wind Farm project and is to be read in conjunction with the Construction Management Plan (CMP).

The purpose of this document is also to describe methods to ensure Hurunui District Council (HDC) and Environment Canterbury (ECan) that various consent conditions specific to Erosion Sediment Control (ESC) are being met. To achieve this, the below consents were interpreted as summarised in Appendix B:

- ECan Consents:
  - CRC214150: To use land for earthworks and vegetation clearance within erosion prone and riparian areas. (Land for Earthworks-Construction).
  - CRC214152: To discharge construction phase stormwater to land (Construction Stormwater Discharge).
  - CRC214156: To discharge water within 100m of a natural wetland during construction of specified infrastructure (Construction Water Discharge).
- HDC Consents:
  - RC070250: Land use consent

Please note, this ESCP focuses only on 'construction phase' consent conditions and excludes 'developed phase' operations and maintenance.

It is noted that the measures outlined in this plan are not the only way in which to manage these issues and different contractors may have alternative management strategies. It is intended that the measures outlined in this ESCP are considered a baseline for compliance with the resource consent. This plan is to be certified by an independent, suitably qualified and experienced certifier/auditor and the plan document and accompanying certification provided to Environment Canterbury within the required duration prior to the commencement of construction.

1.1 General

Mt Cass Wind Farm Limited (MCWFL) has proposed the development of a wind farm, near Mt Cass in North Canterbury. Construction of the scheme will require the development of an access road to the proposed site, internal roads, a temporary concrete batching plant and construction of a number of platforms at the location of each wind turbine.

The construction activities, particularly those associated with earthworks, have the potential to adversely impact the natural environment if not managed in an appropriate manner. This ESCP outlines mitigation measures that will be implemented in order to manage the erosion and sediment generated by the earthwork's activities during construction.

1.2 Site Description

The proposed wind farm will be constructed partially along the top of a topographic ridge, and partially along the lower terrace to the north of this ridge. The ridge extends approximately 7.5km and trends in a north-easterly direction from Mt Cass towards Oldham Peak. The proposed development includes the construction of the wind turbines and associated 15km of access, ridge, ramp and terrace roads, and upgrades to Mt Cass Road as indicated in Figure *1*.

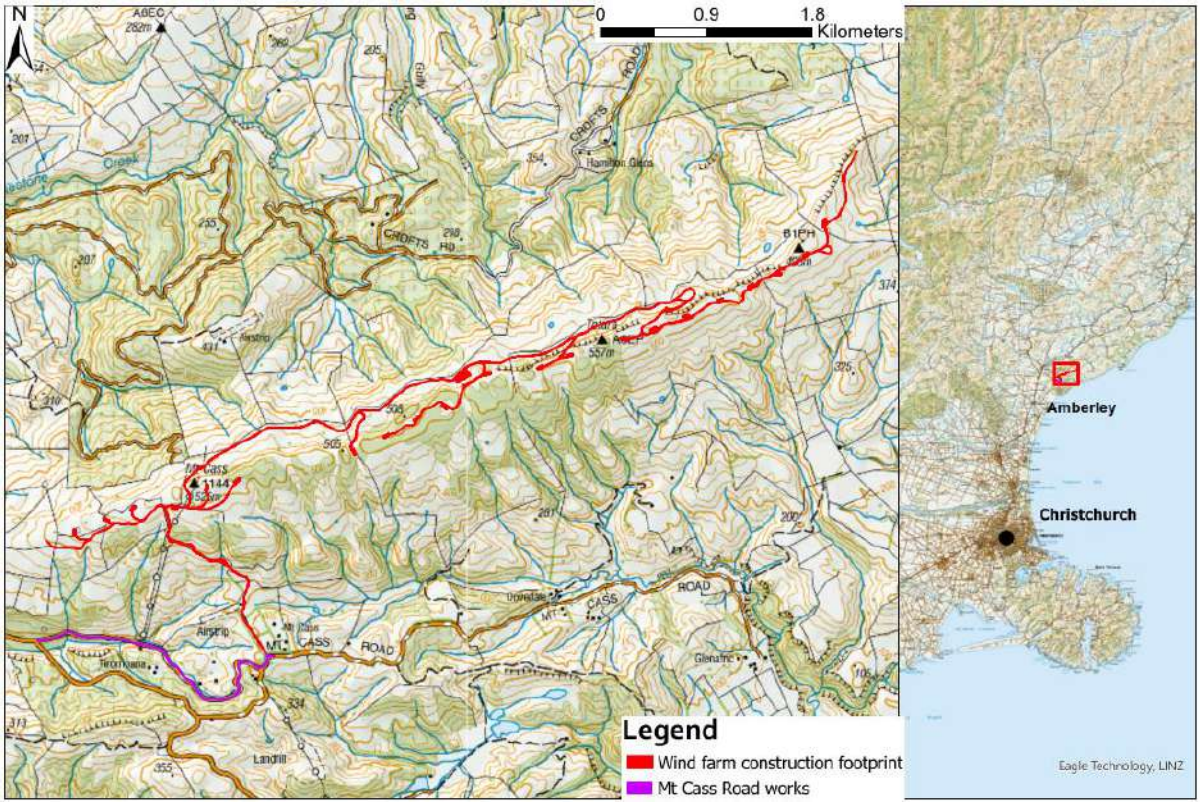


Figure 1 Site Location

The ridge is aligned approximately southwest to northeast and forms an escarpment, with a steep northerly face and a gentler southerly slope. The escarpment is marked by limestone cliffs, with perpendicular ribs, comprising limestone pavement and boulder fields, and dry valleys, forming features on the southern slopes. The existing land use on the ridge is pastoral farming with grazing by sheep and cattle. On very steep slopes and on rock pavements and boulder fields where grazing is difficult, native broadleaved forest and shrubland of variable density are the main vegetation.

The wind farm would extend from a point 1.1km west of Mt Cass Peak to the forked east end of the ridge some 800m to the northeast, southeast of Oldham Peak. The elevation of the wind farm site is between 400m and 569m. At its closest point, the wind farm is approximately 5.5km to the south-east of Waipara and about 10km northeast of Amberley. Access to the ridge is currently made possible by a number of farm tracks off Mt Cass Road which links the site to State Highway (SH) 1 at Waipara.

The proposed wind farm will consist of turbines located along the ridge line. The site will be serviced by a new access road connecting the western end of the wind farm site to the existing road network at Mt Cass Road. From the top of the new access road, the turbines to the west are accessed via a 1km road along the ridge and turbines to the east are accessed via the 5km Northern Terrace Road with ramp roads from the Northern Terrace Road to the ridge. At the end of the Northern Terrace

Road the road climbs back up to the ridgeline and follows the natural contours to the end of the wind farm beyond Oldham Peak. For detailed illustrations of the access road, refer the drawings in Appendix A.

At each turbine location, a temporary flat platform of approximately 45m by 26m will need to be formed to provide working space to site the crane and for turbine component lay down, as well as to contain the turbine foundation. Most turbine locations will require a permanent, smaller flat platform for maintenance purposes. Excess excavated material from these earthworks would be used as fill on the access and ridge road or disposed of at selected spoil disposal sites across the site.

Other facilities required for the wind farm include:

- Temporary laydown areas for materials.
- Temporary concrete batching plant.
- Temporary offices, workshops, stores and staff facilities.
- An electrical substation, located about 2.8km along the Northern Terrace Road, comprising a switchyard and two buildings which will house switchgear, the wind farm central control centre.
- Toilets and staff facilities.
- An internal transmission network between the substation and the turbines.
- An overhead transmission line between the substation and the external power grid.

The 33kV reticulation network within the wind farm site will be underground and will be cabled into the proposed substation. It will then feed into the 66kV network via a 3-phase 66kV transformer. Power transmission from the site will be via a single 66kV overhead line that will connect into the national grid at Waipara.

The transmission line from the substation will approximately follow the northern terrace road back to the top of the access road, then descend down to Mt Cass road near the Tiromoana homestead. These are covered in separate resources consents and are not covered in this plan.

1.3 Mt Cass Rd Upgrade

The section of Mt Cass Road from the Kate Valley Turn off to the Site Entrance will be upgraded under and is to be covered under the construction management plan.

Currently the detailed design is not advanced enough to provide accurate controls for incorporation into this plan. It is anticipated that a separate erosion sediment control plan will be written for this section of work once the design has been completed and the Contractor engaged to carry out this work. This document should align with the CMP and all subplans and will be sent to ECAN for review and approval. The document shall then be appended as a separate sub-plan to the ESCP.

1.4 Development of the ESCP

The proposed sequence of development of this ESCP is set out in the following sections. This plan has been updated jointly by engineering consultants Tonkin + Taylor, McConnell Dowell (MCD) and their earthworks subcontractor Taylors, and appropriate consultation with Electonet Ltd the eBoP contractor. Please note, this ESCP has been completed in parallel to detailed design and as such, some details and/or figures are indicative and subject to change. This includes the final number and location

of culverts; extent of rip rap scour protection, laydown areas; soil disposal areas and road geometry. It is unlikely however that the ESC controls will change.

1.4.1 Submission

This plan will be reviewed by MCWF and certified by Stantec as their suitably qualified independent person. It will then be submitted to ECan and Hurunui District Council (HDC) for comment. Any comments from ECan, HDC or MCWF would be included in a revised plan and that final plan distributed.

1.4.2 Site-Specific Erosion and Sediment Control Work Plans

Before starting each section of construction, a work plan 'checklist' is to be prepared. This work plan will supplement the existing ESC drawings to provide higher resolution details for installation of controls at each sub-catchment. The work plan is designed to provide:

- A method statement of how the controls will be built to meet the resource consent conditions.
- Drawings and specifications of designated sediment control measures.
- Details of any stockpiling locations within the catchment, including erosion and sediment control measures to minimise construction-phase discharges from the stockpiles.
- Details of methods to minimise discharges into exclusion zones.
- Definition of the discharge points where stormwater is discharged to waterways within site, or the overland flow path of stormwater discharged to land where it may enter waterways.
- Sign off for the relevant control against the ECan and HDC check lists in Appendix E.

The ESCP drawings and positioning of control devices were completed through desktop analysis. Control devices supplied in Appendix A are a selection of appropriate solutions, however further information relating to the exact position and design of each device will follow detailed design. Due to the vast nature of the site, indicative locations were provided to the closest 10m scale. It may be possible that the control devices outlined in the drawings need to be re-positioned or substituted based on changes to the design, discovery of other overland flow paths or features such as rocks onsite.

It will be the Contractors responsibility to reference the drawings for the general location of devices (silt fences and/or channels). It will also be the Contractors responsibility to ensure that the most practical device is installed prior to any earthworks taking place based on being on the ground. This relates to clean water diversion bunds, all of which have not been able to be shown due to the scale of the site being reflected in five drawings and purposes of clarity.

1.4.3 Implementation, Monitoring and Adaptation

The contractor will install the agreed erosion and sediment control measures as detailed in the approved ESCP. The control measures would be monitored at the agreed intervals, and regular maintenance carried out. The effectiveness of the controls would be re-assessed, and the plan adapted, and control measures modified if necessary.

If modifications are made then

- They will be for the purpose of improving the efficiency of the erosion and sediment control measures and shall not result in reduced discharge quality.
- Be consistent with the conditions of the resource consent.
- Be certified by the agreed SEQP as per condition 13c.

The consent holder shall provide a copy of any such amendment to the ESCP and the certification to Canterbury Regional Council, Attention: Regional Leader – Monitoring and Compliance, prior to giving effect to the amendment.

Audits of ESC measures would be completed in accordance with Section 0. Records of these audits will be maintained by the Contractor and provided to HDC and ECan if requested.

2. Extent of Land Disturbance

The extent of works covered by this ESCP are listed in Table 1. For the purposes of adhering to a construction programme, this ESCP has been submitted in parallel to detailed design. Therefore, exact figures (such as areas and degrees of slopes for certain areas) are unable to be supplied at this time.

Description:	Area (m2)	Drawing reference	
Construction stage 1	4,400	1017740.2000-311	
Construction stage 2	32,809	1017740.2000-311 - 1017740.2000-312	
Construction stage 3	19,956	1017740.2000-312	
Construction stage 4	52,023	1017740.2000-312 - 1017740.2000-313	
Construction stage 5	27,865	1017740.2000-314	
Construction stage 6	56,269	1017740.2000-314 - 1017740.2000-315	
Spoil disposal areas:	**Area (m2)**	**Average Slope (degrees)**	**Drawing reference**
Area D-1	29,951	20°	1017740.2000-311
Area D-2	8,268	18°	1017740.2000-312
Area D-3	9,836	19°	1017740.2000-312
Area D-4	1,906	20°	1017740.2000-312
Area D-5	13,591	18°	1017740.2000-313
Area D-6	7,967	22°	1017740.2000-314
Area D-7	8,650	8°	1017740.2000-314
Area D-8	5,506	24°	1017740.2000-314
Area D-9	26,852	32°	1017740.2000-315
Area D-10	13,644	20°	1017740.2000-315
Area D-11	1,737	9°	1017740.2000-315
Area D-12	25,660	25°	1017740.2000-315
Laydown areas:	**Area (m2)**	**Average Slope (degrees)**	**Drawing reference**
Area L-1	27,000	4°	Figure 4 Section 3.1.2
Area L-2	13,300	8°	1017740.2000-311
Area L-3	5,300	6°	1017740.2000-313

Concrete batching plant	9,836	11°	1017740.2000-312
Substation / Operations and maintenance areas	To be completed following detailed design	To be completed following detailed design	All drawings
Turbine platforms	‘’ ‘’	‘’ ‘’	All drawings
Total	**’’ ’’**	**’’ ’’**	

Table 1 Extent of Work

3. Construction sequence and methodology

The site will be broken in to six zones to stage the construction. These zones are shown in Figure 2 and are intended to follow a logical construction sequence and provide a staged entry to the site to ensure that all ecological controls and consent / landowner agreements are implement via a permit to work system.

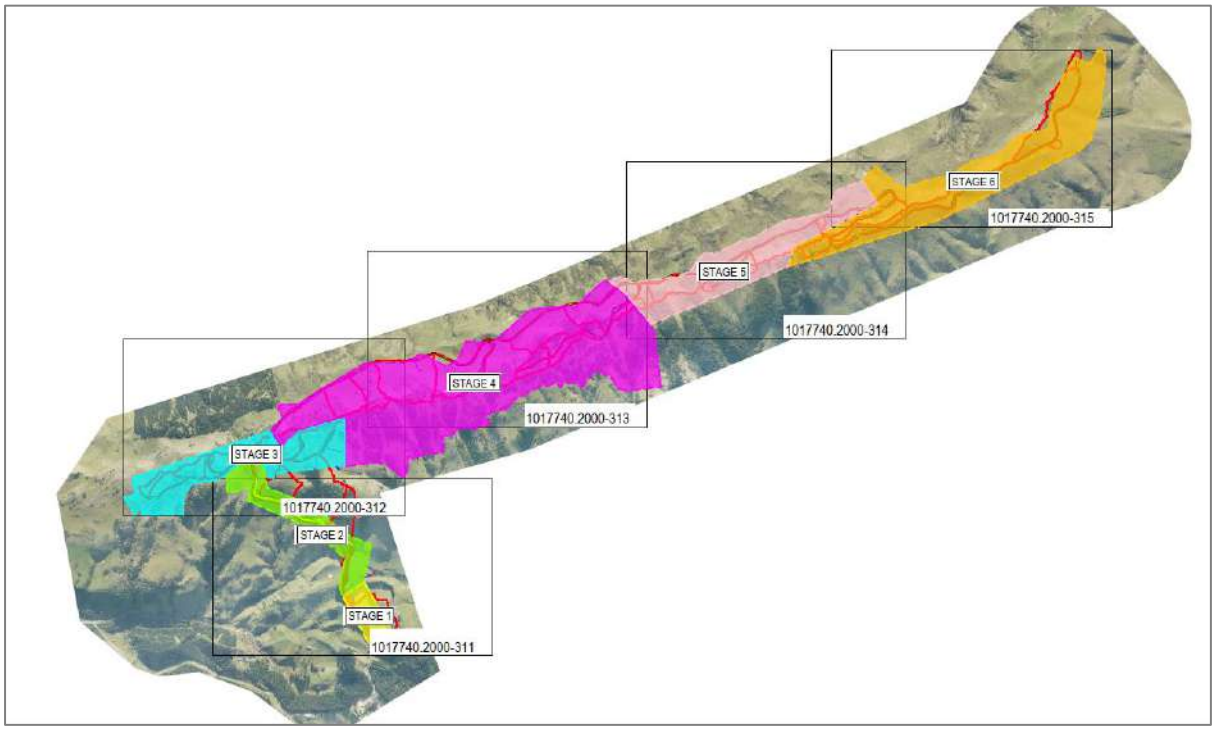


Figure 2 Mt Cass Construction Zone Boundary Plan (refer Appendix A sheet 1 for more detail)

Construction is likely to occur in a linear and progressive manner along the ridge. The sequence is likely to follow the 13 steps provided below. A more detailed description of works including dates are provided in the construction sequence in Appendix G.

1. Installation of sediment control measures in sequence with earthworks.
2. Earthworks for and construction of the access road and the construction camp and laydown area at the foot of the access road.
3. Earthworks for and construction of the western extension followed by the northern terrace, ramps roads, and sections of road starting at the western end and with the Cass Spur Road and the Southern Spur Road. This would include the creation of the spur roads and the turbine platforms. The concrete batching plant area and other laydown areas would be created as the earthworks moved through that area.
4. Construction of the Northern Terrace Road and the Ramp Roads, starting at the western end and continuing progressively east along the terrace.
5. Construction of the Ridge Road progressively to the east.
6. Spoil disposal areas close to the current earthworks work front would be developed to minimise the haul to more distant spoil disposal areas and to prevent weed spread.
7. Cable reticulation along the Ridge and Northern Terrace Roads would be installed once the road is initially cut to subgrade and prior to basecourse placement.
8. Substation and transmission line construction.

9. Mt Cass Road will be upgraded, under a separate contract so as to not affect earthworks on the wind farm site.
10. The concrete batching plant would be established and excavation for the turbine foundations undertaken, permitting construction of the turbine concrete foundations.
11. Turbine foundation construction would progressively move along the wind farm, some distance behind the earthworks.
12. Turbine erection would similarly follow along the wind farm behind foundation construction.
13. Progressive commissioning.
14. DOC track extension

3.1 Site Laydown Areas

Two site lay downs will be constructed by removing and stockpiling topsoil for later re-instatement. Imported aggregates will be used to form a hard stand area in both yards.

3.1.1 Site Office & Laydown

The main site office is located at the entrance of the site as illustrated in Figure 3. The trees through the middle of the site will be removed and placed into stockpiles where they will be mulched for future landscaping on the project. Once this is completed, the topsoil stripping operations will commence.

The topsoil will be placed in a stockpile area outside of the yard outline, where it will be stored for the duration of the project prior to being re-spread over the yard area prior to disestablishing from site. Some of the topsoil will also be utilised as a form of erosion control creating an earth bund around the yard area, which will stop water runoff to the surrounding areas.

Where required, localised casting and filling of in situ material will be undertaken to ensure a flat surface is available for the purpose of running the project from the yard area. Aggregate will then be imported from the yard and spread and compacted to a minimum depth. A silt fence, K-Log channel and sediment decant earth bund (optional) have been specified on the northern edge of the carpark to treat any sediment mobilised due to vehicle movements in the carpark.

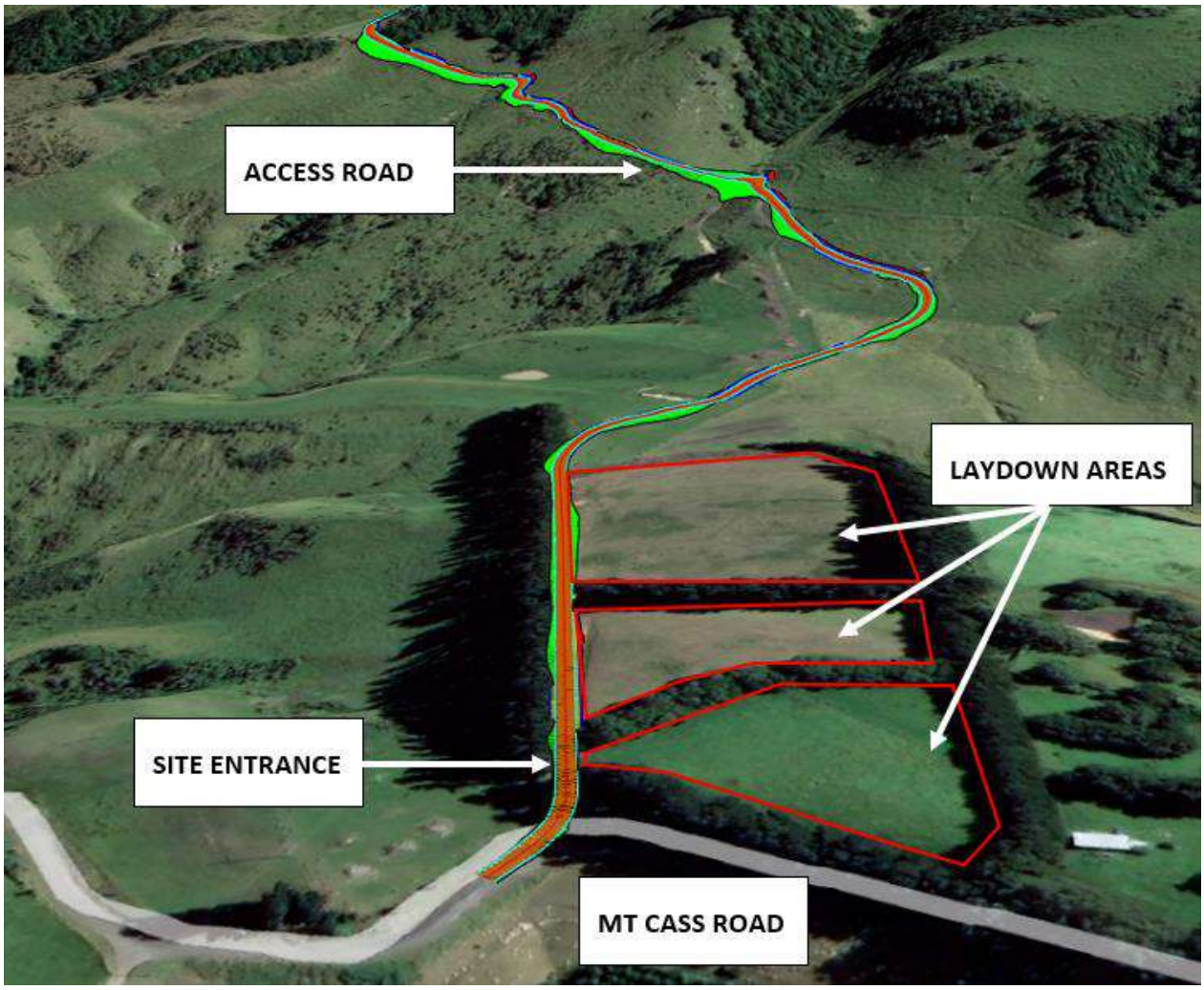


Figure 3: Illustration of three separate laydown areas located on right of entrance to project site (Note internal shelter belts will be cut down and mulched).

3.1.2 Symonds Road Construction Yard

A second hard stand will be built at the intersection of Mt Cass and Symonds Rd. This yard is used to store the wind turbine tower and blade units prior to transporting them to the site. The site is flat and poses very little risk from an erosion and runoff management perspective. The construction method will be the same as the main site laydown area. This is shown in figure 3 below.

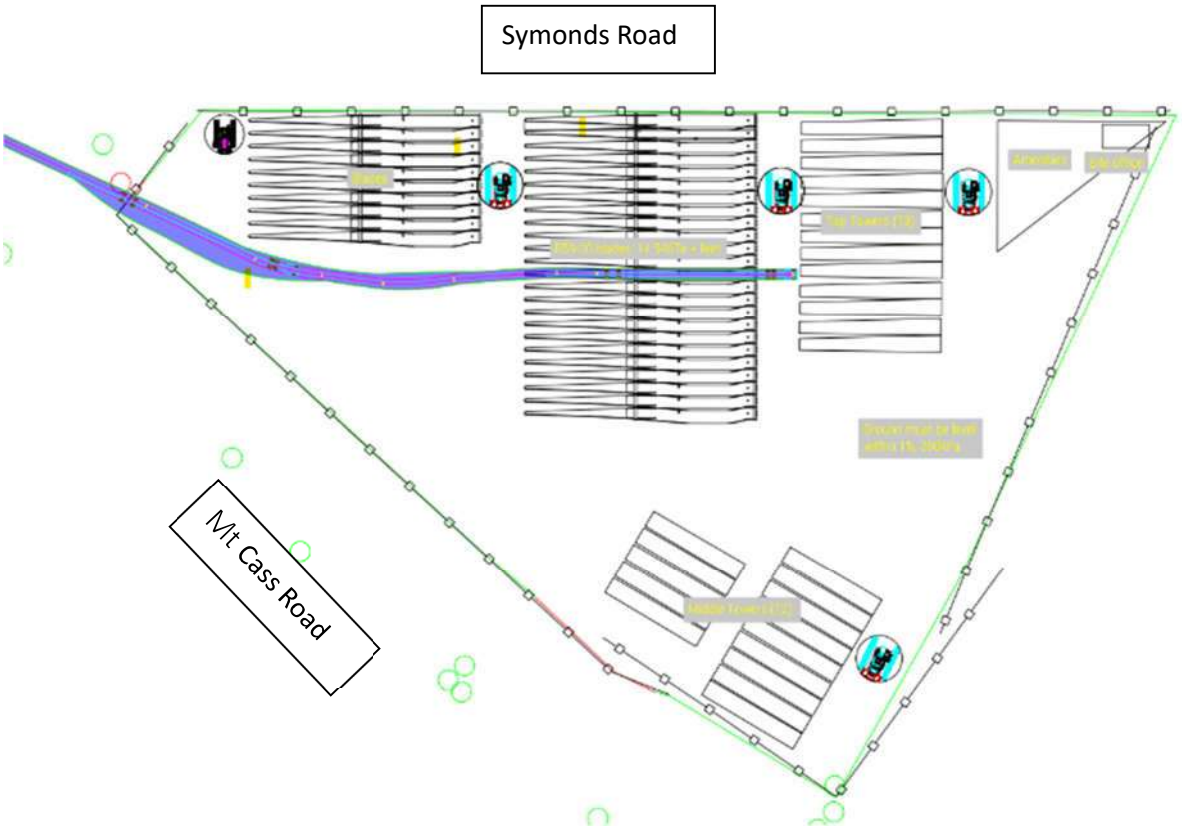


Figure 3 Illustration of 'Symonds Rd construction yard' used to store the wind turbine tower and blade units

4. Erosion and Sediment Control Principles

4.1 Overview

The key principles to be employed for this ESCP are to stage and undertake the earthworks in a manner that minimises the potential for erosion of the exposed soils, and to employ control devices to manage all sediment-laden water prior to discharging from the site. Control of water runoff or concentrated water flows is one of the key focuses for this project given the topography. The ECan ESCT and this ESCP take a best practicable option (BPO) approach to the management of erosion and sediment control.

4.2 Principles

4.2.1 General

Guidance on the appropriate control measures is provided by ECan's ESCT which sets out guidelines for land and waterway-disturbing activities that can cause sediment and dust discharge to water and air. The guidance and all associated resources are available at https://esccanterbury.co.nz. The key principles of the ESCT are summarised below and incorporated throughout this document:

- Minimise disturbance
- Do the construction in stages
- Protect slopes
- Protect waterways
- Stabilise exposed areas quickly
- Consider the weather
- Install perimeter controls and diversions
- Use sediment control tools, including mixing and matching tools as necessary
- Adjust the plan as needed
- Monitor and adjust tools
- Training and developing experience.

4.2.2 Design Storms

Rainfall for the design storm events has been obtained from the High Intensity Rainfall Design System (HIRDS). This software provides rainfall intensities for events of variable duration and variable return period specific to the location being assessed and the runoff characteristics of the catchment under consideration. The runoff coefficients are based on HDC's Development Engineering Standard for bush, pasture and berms on poor draining soils with additional factor for >20% ground slopes for overland flow and unsealed metalled pavements.

Two rainfall scenarios form the design basis of detention features and permanent road relating to ESC measures. These scenarios are commonly referred to as the Annual Exceedance Probability (AEP) or the Average Return Interval (ARI) and were agreed during the Environment Court proceedings. Key features of the rainfall design scenarios are as follows:

1. 5% AEP) / 20-year ARI:
    - All ESC runoff and sediment control (detention features) during construction.
    - Based on 10-minute duration storm.
    - 50.7 mm/hr (HIRDS, 10 min duration)
    - Collected runoff is designed to pass through culverts under the road located at appropriate low points.
    - Runoff coefficient 0.40 (overland flow), 0.5 (unsealed metalled pavements)
    - No climate change allowance has been made as detention features are designed and constructed for the purposes of construction phase only.

2. 2% AEP / 50-year ARI:
    - All runoff and sediment control (detention features) for permanent roads.
    - For the larger flood flows the road may be overtopped briefly during the flow peak but flow will remain confined to the same flow channel either side of the road formation.
    - No climate change allowance has been made as the road and drainage is designed and constructed for the purposes of access for the next five years only.

Please note, the primary stormwater conveyance network (v drains and culverts) is designed convey events up to (and including) the 10% AEP 24 hr rainfall event. Please refer to T+T report Access Road Design Report - 80% Detailed Design, December 2022 (1017740.2000 v1.0) for further information on stormwater and pavement design.

4.2.3 Specific Principles in Relation to Mt Cass

A key requirement of the ESC measures is the control of sediment in relation to the sinkholes. The principles for managing sediment in relation to discharges in the vicinity of sinkholes are:

- Use of ESC measures to provide diffuse discharge of runoff from disturbed sites to vegetated surfaces rather than point discharge.
- Avoidance of additional runoff to catchments with sinkholes.
- Maintenance of the natural style of runoff and percolation, and wherever possible flow paths which convey flow overland to sinkholes.

Areas of sinkholes near the construction footprint are identified in Appendix D and will be identified on any Site-Specific Erosion Sediment Control Plans. Refer section 4.3.5.

The project site is described as land of gentle to steep slope, soft rock country and other land with moderate to steep slopes. Importantly, there are no permanently running watercourses crossing the site. The proposed works however cross several gullies that would carry flow under high rainfall conditions. The waterways considered to meet the definition of river, and the wetlands considered to meet the definition of natural wetland within the project site are identified in Figure *6*. The buffer areas adjacent to the waterways and wetlands are identified in Figure 6 and 7. Refer to ESC drawing 1017740.2000-313 for detail on dirty water diversion and treatment measures specific to these wetlands.

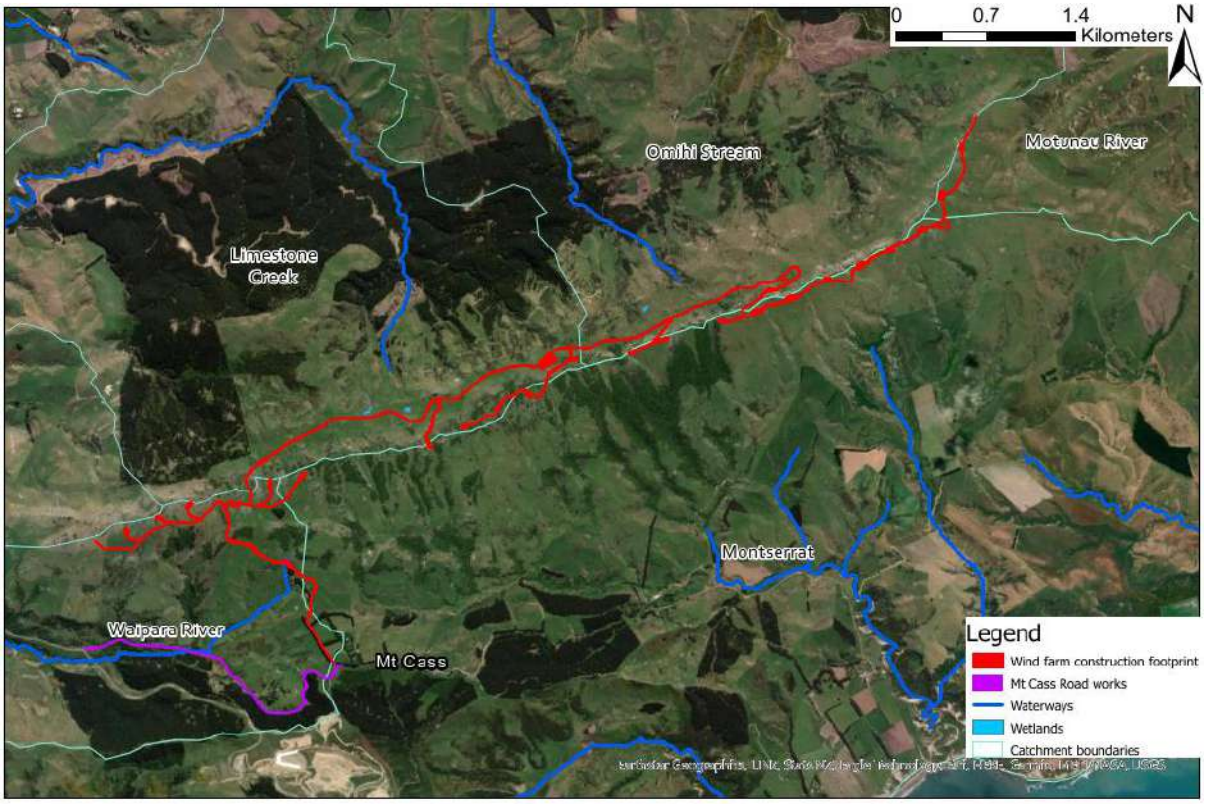


Figure 4 Waterways within and near the Project Site. Please note, due to the scale the wetlands are illustrated more clearly in Figure 7.

With reference to the two wetlands located adjacent to the northern terrace road west (figure 7); a series of preventative controls will be installed to reduce runoff into these low areas. These controls include:

- Silt fences: Placed immediately beside the road on the northern (lower) side to capture and contain any silt runoff and/or dust from the road. These fences will essentially line the entire length of road to protect the wetlands as a primary measure.
- Dirty water diversion channels: Placed on the outside (lower) side of the silt fence as a secondary measure to divert any runoff that has passed through the silt fence. These channels will essentially run the entire length of road to protect the wetlands. They will be constructed to on a gentle cross-grade to the natural contours to ensure 'dirty water' is routed around the wetlands to discharge downhill.
- Clean water diversion bunds: Installed in strategic locations on the uphill side of the road, to route clean water sheet flows away from soil disposal site D5 (as illustrated on ESCP drawing 1017740.2000-313).
- K – Log channels: Mesh tubes filled with bark chips and a granular anionic polyacrylamide (PAM) flocculant designed to be installed at the end of each dirty water diversion channel. The K logs will essentially treat the dirty water to ensure settled site remains contained. For further information refer section 4.3.4.
- Sediment decant earth bunds: To be installed where overlands flows converge resulting in elevated flow requiring pre-treatment. For example, downhill from turbine platform 8F. These will be established using level spreaders and/or cut off drains to aid in the collection and dispersal of sheet flows across a wider area.

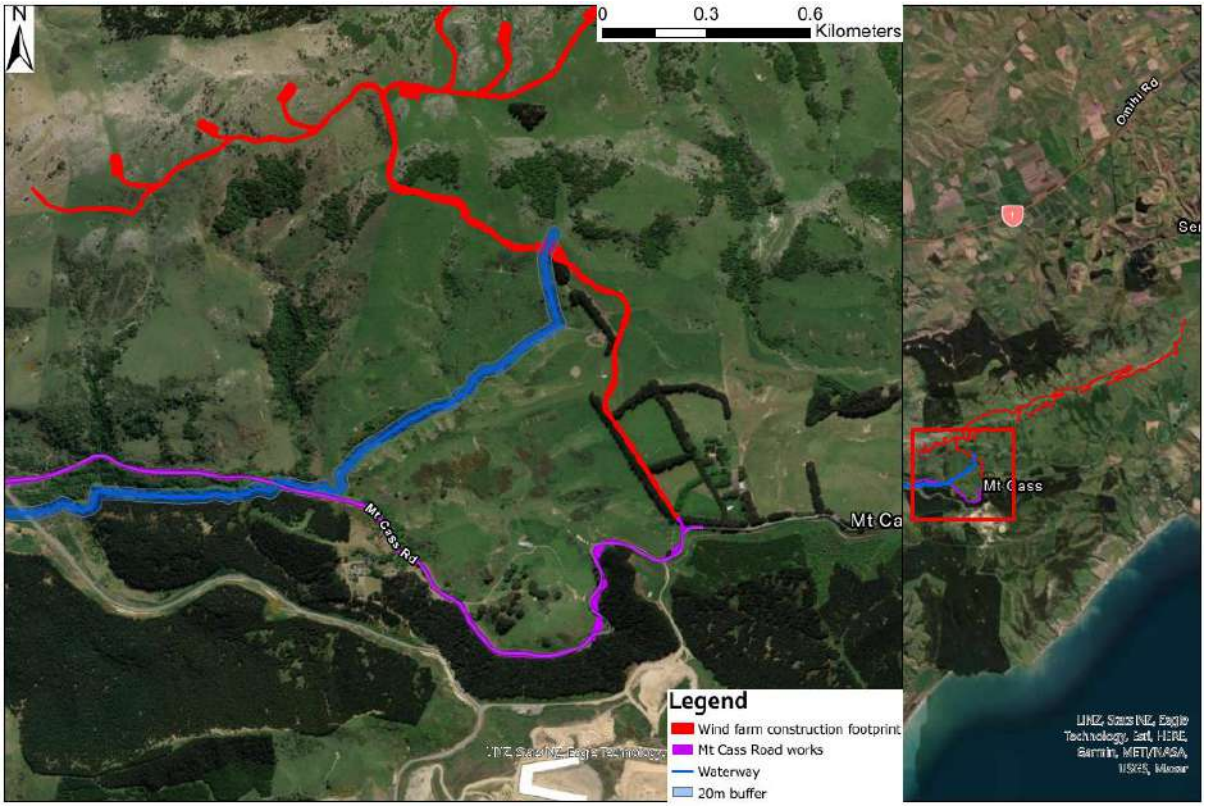


Figure 5 20m Buffer around Waterways within the Project Site.

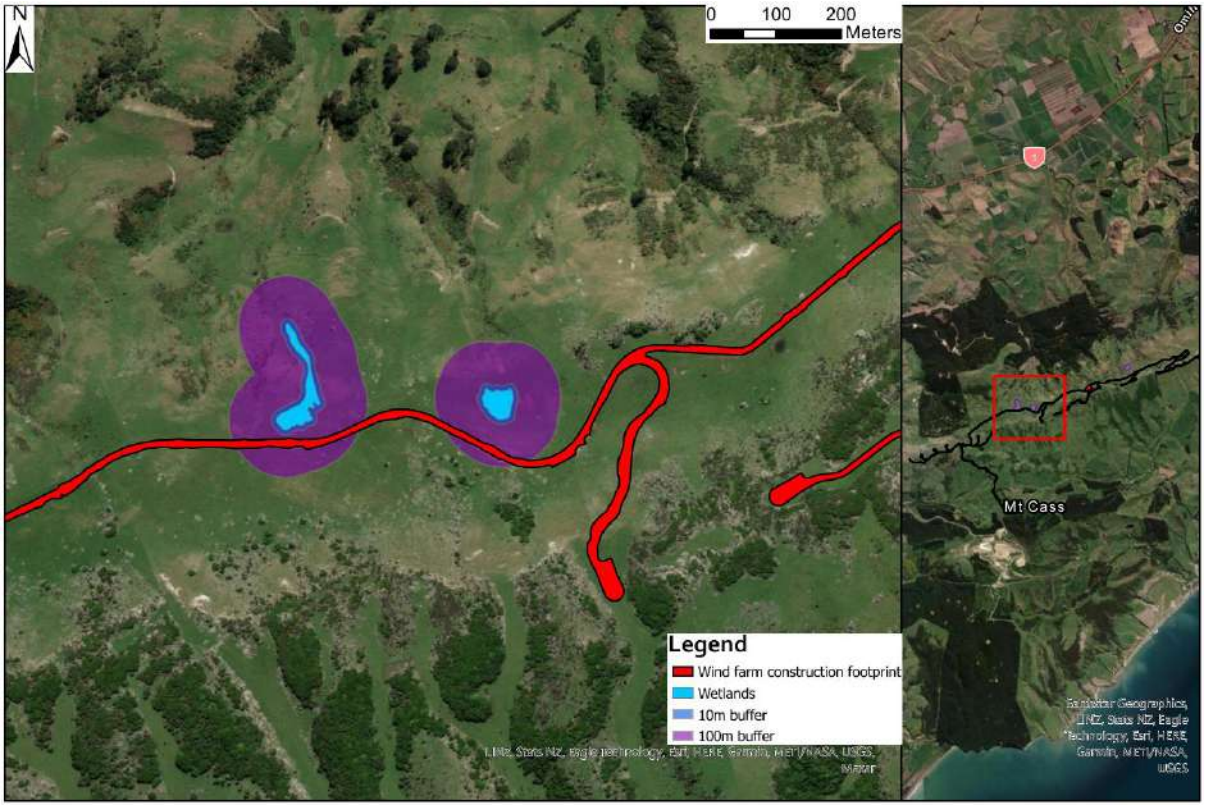


Figure 6 10m and 100m Buffers Around Natural Wetlands Within the Project Site

Deploying the best practicable option method involves choosing one of the control mechanisms described in the following sections. These have been taken predominantly from the ESCT and the New Zealand Forest Road Engineering Manual (NZFREM). The selected methods shall be reviewed

and adapted as necessary throughout the project based on the success of the particular method in achieving sediment and erosion control. For the purposes of erosion and sediment control the project can broadly be broken into five segments, namely:

1. The Ridge Road, Western Road, and turbine platforms, constructed along the ridge of the site, with limited catchment from either direction.
2. The Access Road, constructed on moderately steep side slopes.
3. The Northern Terrace Road, constructed at the base of the north scarp face.
4. The Ramp Roads constructed on the steep scarp face.
5. Disposal areas, constructed on shallow to moderately steep slopes.

The catchment areas and size of each catchment within the project site are identified in the table in Appendix C and catchment plans in Appendix E. Most of the ground exposed during construction will be limestone, with varying degrees of weathering, which has a high natural resistance to erosion. The soils most susceptible to erosion will be the topsoil and other near surface soils which overlie the rock. Small quantities of these soils will be exposed in the cut faces; however, they will be at their most vulnerable to erosion when stored in stockpiles.

In order to manage these issues, the following strategies will be adopted:

- Topsoil required for re-vegetation of permanent slopes will be stored along the alignment.
- Other soils will be taken directly to spoil disposal sites.
- Spoil disposal areas will be re-vegetated progressively as material is placed. In practice this is likely to involve sowing areas with pastoral grasses in blocks of approximately 1 ha, although this would depend on weather or seasonal conditions and the quantities of material being moved at any particular time. While awaiting re-vegetation, topsoil surfaces will be stabilised using methods such as soil binders, geotextiles, erosion control blankets and mulching.
- As far as is practical, permanent slopes will be covered in topsoil and re-vegetated as soon as possible following formation.

4.3 Erosion and Sediment Control Measures

The following sections provide a preliminary assessment of how it is intended to control sediment and runoff for the proposed project options. The actual measures used in construction may vary, depending on contractor preference and the final design layout. However, all measures either currently proposed or as modified for construction, will be compliant with the ESCT.

4.3.1 Install Perimeter Controls and Diversions

A key method to minimise erosion and the discharge of sediment laden runoff is to prevent water entering from outside of the earthworks site. The ESCT promotes the separation of clean water (that which has run across undisturbed ground) from dirty water (that which has run across disturbed ground). Water which falls within the construction zone ideally should be treated before reaching a clean water body.

For many parts of the site, particularly along the initial uphill section of the access road, the relatively small catchment areas involved would make this separation overly complex and impractical to build

and maintain the necessary devices. It is our view that the less soil disturbance the better. Given the steep topography, extensive clean water diversion channels (or stabilised earth bunds) would have to be constructed approx. 10m away on the uphill side, effectively 'above' the access road. It is likely that the excavations involved to establish these clean water diversion bunds will cause unnecessary sediment release and pose safety issues to the excavator operator.

If clean water diversion bunds were constructed (indicated by the yellow line in Figure 7), they would need to be extensive to avoid any spill over into the road below. To divert clean water from mixing with sediment from the road, they would also need to run parallel to the constructed road for the entire length of the road where they would discharge to a localised area. Significant surveying and construction techniques would need to be employed to ensure that flow does not concentrate at low points and spill out (for instance in gullies), rendering the channel impractical.

For these reasons we consider the construction of clean water diversion bunds on a steep hillside (above the primary conveyance channel) as being complex to construct, capable of creating more sediment release and an unnecessary health and safety risk. Our approach therefore is to allow clean overland flows to run into the rock lined channel on the interior side of the access road where necessary. If any mixing occurs with 'dirty' water residing in the drain; coarse sediment capture will be provided 'in-situ' within the rock lined channel, followed by sediment traps described further in section 4.3.4. Treated water will then be dispersed downhill into long grasses to replicate natural processes through culverts at designed locations. The actual extent of the work site requiring the combining of clean and dirty water on steep uphill slopes will be defined following detailed design.

Figure 7 Photo Depicting the Steep Slopes Above and Below Where the Access Road will be Constructed.

In lower grade areas that allow for controlled overland flows, the approach will involve stripping of topsoil and some of this material will be used to form bunds along the uphill edge of the construction. These bunds (approximately 0.5m high) will prevent overland flows from entering the construction zone. Water re-directed by these bunds will be taken to natural low points where adequately sized

culverts will be used to bypass the water beneath the construction zone and long-term corridor. In limestone areas, point discharges of the water into sinkholes will be avoided.

4.3.2 Minimise Disturbance and Stabilise Exposed Areas Quickly

As previously mentioned, most of the ground exposed during construction will be limestone, with varying degrees of weathering, which has a high natural resistance to erosion. The soils most susceptible to erosion will be the topsoil and other near surface soils which overlie the limestone. It is noted that parts of the construction footprint are located within identified high soils erosion risk areas, as shown in Figure 8.

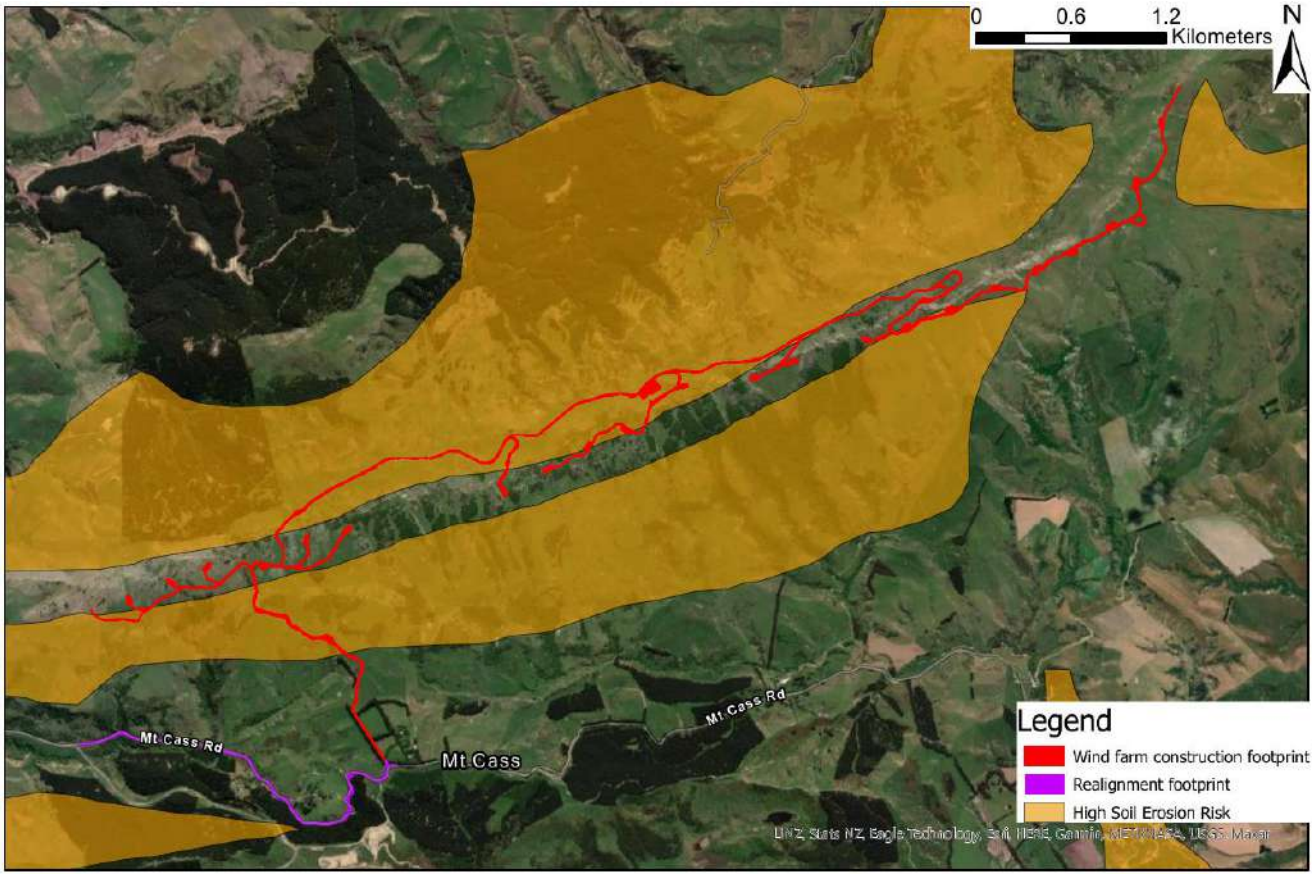


Figure 8 Areas of High Soil Erosion Risk

Small quantities of these soils will be exposed in the cut faces; however, they will be at their most vulnerable to erosion when stored in stockpiles. In order to manage these issues, the following strategies would be adopted:

- No earthworks shall occur within active flow paths of water, areas of saturated soils, or where soils are unstable due to transient water content for the period of the rainfall and the following 12 hours after cessation of the rainfall.
- Only topsoil required for re-vegetation of permanent slopes will be stored along the alignment.
- Topsoil which is surplus to these requirements will be taken to spoil disposal areas immediately.

- Spoil disposal areas will be re-vegetated promptly and progressively as material is placed. In practice this is likely to involve sowing areas with pastoral grasses in blocks of approximately 1 ha, although this would depend on weather or seasonal conditions and the quantities of material being moved at any particular time.
- While awaiting re-vegetation, topsoil surfaces will be roughened in accordance with Checklist 6 of the ESCT or protected with straw mulching pressed into the surface with crimping discs in accordance with checklist 11 of the ESCT. Refer to Figure 9 and Figure *10* below.
- As far as is practical, permanent slopes will be topsoiled and re-vegetated as soon as possible following formation. Any topsoil stockpile that is intended to remain in situ for more than 4 consecutive weeks shall be hydroseeded if intended to remain for more than 4 months.
- Roadside channels will incorporate check dams and hard armouring as required to slow flow velocity to below levels that cause scouring in the channel.
- Culvert inlet/outlet energy dissipation devices will be constructed early to provide protection against concentrated flows. Refer stormwater design report.

Figure 9 Soil Surface Roughening to be Employed Downstream of Areas Where the Soil has been Disturbed.

Figure 10 *Straw Mulching to be Used in Conjunction with Surface Roughening.*

4.3.3 Sediment Control Tools to Prevent Sediment Leaving the Site

Prevention of sediment leaving the site will be achieved by appropriate treatment of all collected rainfall runoff and the removal of soil from vehicle tyres at or prior to the exit points. The earthworks operation will essentially be self-contained within the construction site. Earthworks trucks will not generally use public roads during the project, except for limited quantities of specialist materials which cannot be supplied from on-site excavations.

Movement of vehicles from the construction site onto public roads will consist mostly of turbine delivery trucks, material delivery vehicles e.g. reinforcing steel, and light vehicles to transport the workforce to and from site. The concrete trucks may also return to home base between pours. Access onto public roads will be restricted to one access point off Mt Cass Road where the rumbled strip will be established. In order to mitigate the transfer of sediment onto the public road system, the following measures will be implemented:

- Haul roads traversed by road vehicles will be sealed (southern access road), surfaced in limestone or imported basecourse to form an “all weather” surface that will minimise the sediment that can be picked up by vehicles.
- Rumble strip (cattle stop or similar) will be utilised at the formal exit points to remove sediment before vehicles leave the site, such as the example shown in Figure 11.
- Sweeping of intersection points with public roads from time to time as required to keep them to a standard acceptable to the district council.
- The section of access road immediately in from Mt Cass Road may be sealed (for dust control) which will also help to avoid sediment pick up over this section of road.
- Reference to protecting the road surface with basecourse will be covered in the geotechnical / pavement design scope.

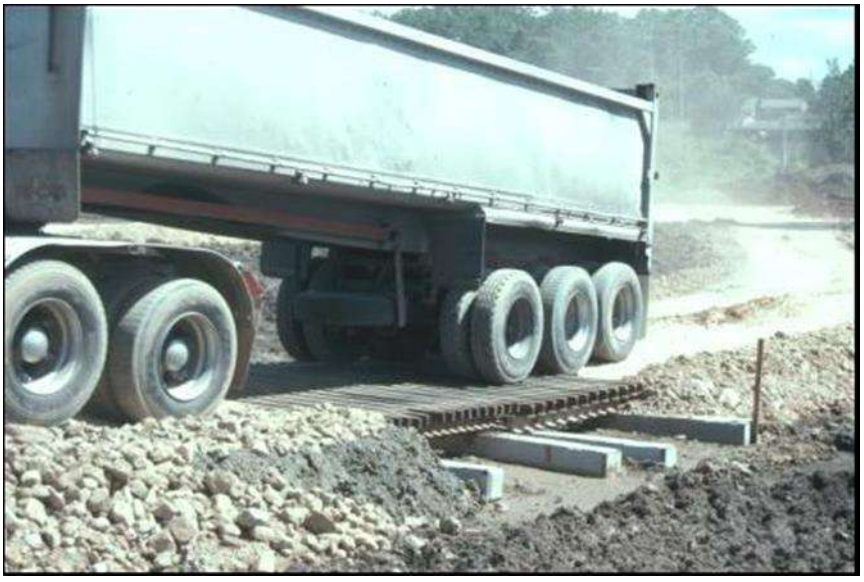


Figure 11 Rumble strip similar to that illustrated above will be placed at the main site access.

4.3.4 Sediment Control and Treatment Devices

The erosion and sediment control methodologies adopted for this project are aimed at ensuring a high level of treatment for low and medium intensity rainfall. Control devices have been selected from the ESCT, NZ Forest Road Engineering Manual and recent industry innovations. Where feasible,

some of the below devices will be employed in specific areas (refer appendix E – ESCT checklists) for detailed descriptions on their purpose, installation requirements and standard detail.

One particular sediment control device suited to this type of topography are Kiwi Logs, (or 'K-log channels' as depicted in the Appendix A - ESCP drawings; and Appendix F for standard details). These devices are mesh tubes filled with bark chips and a granular anionic polyacrylamide (PAM) flocculant. They are available in varying sized lengths, up to 3m long. K-log channels can be used either on their own, or interspersed with non-active sediment logs, to capture sediment as it flows through in the form of dirty water. The use of K-log channels support or ESC philosophy of in-situ treatment as opposed to construction of extensive sediment basins on the ridgeline. Further, K-log channels enable 'diffuse' treatment by maintaining existing surface drainage patterns and pathways; and natural processes such as long grasses over broad areas as opposed to point source discharges from a pipe outlet.

K-Log channels have been specified downstream of sediment disposal areas at the confluence of overland flow paths (as illustrated in Figure 12). The K-log channels will primarily be used for treatment of dirty water only. It will be the Contractor's responsibility to ensure the K-log channels are installed in areas of shallow grades (refer supplier specification). In some cases, K-log channels can be used in conjunction, or in replacement of sediment decant bunds depending on the extent of disturbed land and confluence of channels. It will also be the Contractors responsibility to size the K-log channels (treatment is a function of length) for each location.

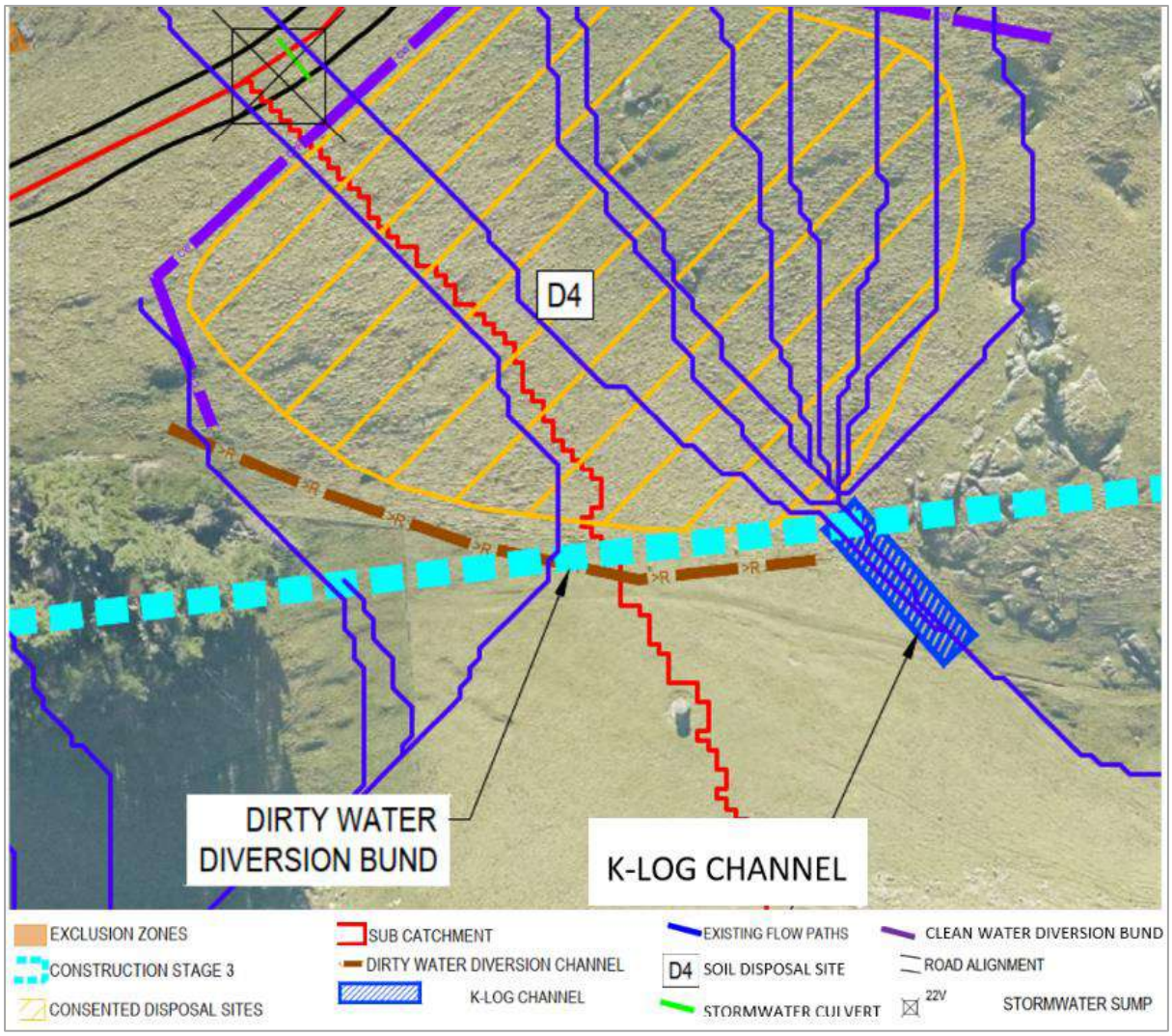


Figure 12 Example of typical K log channel placement.

Figure 13 illustration of K-log channels and natural fibre matting successfully retaining fine sediment. (Source: EnviroCo)

- Sub-strata and topsoil samples have been taken and bench tested with PolyDADMAC organic coagulant to ensure optimal performance of the K-log channels. It is vital that the K-Logs are

installed and accordingly to the suppliers specification to ensure TSS concentrations are less than 100mg/L. For larger catchments (disturbed area exceeding 0.3 ha), sediment retention ponds constructed in accordance with the ESCT may be appropriate. An example of ESC measures set up within a catchment where access or haulage road construction is occurring is shown in Figure 14. This identifies the contributing upgradient catchment as the purple dashed line.

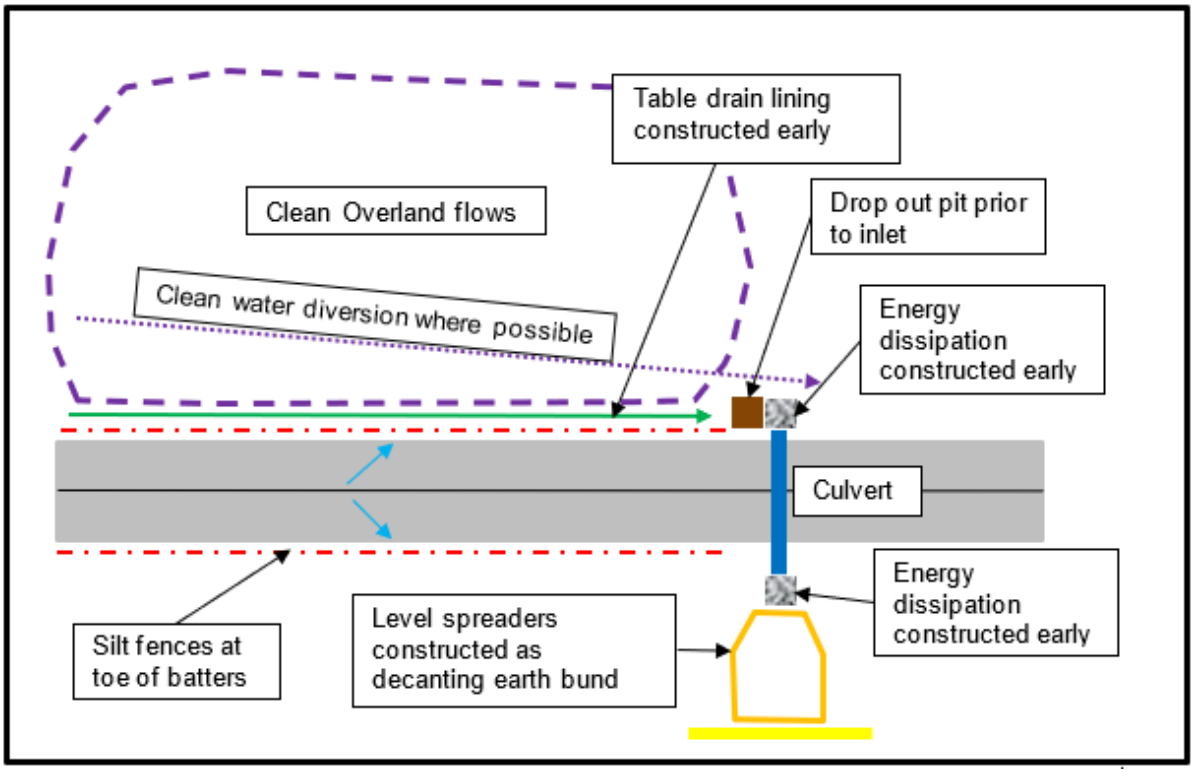


Figure 14 Example set up of ESC measures for a sloping catchment with road construction

Figure 15 Example of energy dissipation rip rap (left) that will be employed in steep grade areas within the channel; and a sediment trap (right) that may be dug upstream of culverts. (Source: NZ Forest Road Engineering Manual).

Sediment traps will be constructed upstream of culverts throughout the access road. Given the confined nature of the road, they will be excavated on the interior side and be approx. 1.5m deep, 2.5m long and 1.0m wide. Water will enter the sediment trap having passed through approximately 45-100mm sized rip rap to absorb energy and provide some coarse sediment capture.

For any section of the works located within a natural depression, rainfall runoff within this catchment will continue to infiltrate into the ground as it currently does. The disturbed formation within this area will be bound by silt fences where necessary while the side batters are being re-grassed. Silt fences will be design and installed in accordance with ESCT.

4.3.5 Sinkholes

The objectives for sediment control around sinkholes is to:

- Prevent further sediment entry into the sinkhole due to construction earthworks
- At completion, re-form slopes to a form resembling a natural contour and redirect rainfall run-off into the sinkhole; this re-directed runoff is to be of a similar quality and quantity (both rate and volume) to that which would have entered the sinkhole prior to the earthworks.

Due to the significant number of small karst features, control measures have not been illustrated on the drawings. As required under condition 37b of HDC consent RC070250; sediment entering subterranean karst features will be minimised in the following manner:

- Runoff should provide diffuse discharge to vegetated surfaces.
- Additional runoff to sinkholes should be avoided.
- Aim to maintain the natural runoff and percolation and if possible, the flow paths.
- Development should be staged to ensure exposed earthworks are kept to a minimum and revegetated promptly and progressively.
- Where practical, install silt fences as per Appendix A drawing 1017740.1000-323) on the side of each karst feature that is exposed to the highest risk of sediment.
- Sinkholes should generally be avoided rather than built over.
- If the incoming water is considered ‘dirty’ install a dirty water diversion channel (as per Appendix A drawing 1017740.1000-320).
- Monitor the karst feature to assess draw down and if necessary, pump out any sediment laden water following rainfall.

In locations where the sink holes natural catchment has been reduced by the proposed works, a suitable portion of clean or treated run-off will be diverted from an adjacent catchment to maintain a similar natural catchment area. In locations where the sink holes natural catchment has been increased by the proposed works a suitable portion of clean run-off will be diverted away from the sink hole to maintain a similar natural catchment area. In all cases, runoff directed towards a sinkhole will be via a vegetated catchment.

In other areas there are likely to be sinkholes or ground fissures which are unavoidably on the road alignment. These sinkholes or fissures will be investigated with ground penetrating radar to establish size. It will be possible to "bridge" such sinkholes/fissures with a filtered and reinforced arrangement of fill. This would allow water to percolate in but without carrying sediment with it. Alternatively, a decanting earth bund and/or K-log channel shall be positioned upstream.

4.3.6 Spoil Disposal Sites

Indicative spoil disposal areas have been identified by MCWF using criteria which seek to avoid or minimise impacts on the biodiversity and geomorphological features at Mt Cass. Stockpiles and spoil sites will need to be individually managed for sediment generation.

Prior to soil being spread onto a consented disposal area, the area will be clearly marked out, and topographic features (such as overland flow paths or gullies) identified. A site specific workplan (refer section 1.3.2) checklist(s) will be carried for each disposal area out at this time. As part of this process, a site-specific checklist will be completed depending on which control measure(s) will be installed (refer Appendix F).

Due to the steep terrain and volume of spoil at sites D9, D10 and D11, clean water cut off bunds will be established during the site specific workplan phase. For the purposes of this desktop-based assessment, silt fences and sediment decant earth bunds have been provided only. Most likely, the primary road drains (on the interior side) will act as the clean water diversion channel. This 'v' channel will collect all runoff from the road and route flows above and away from the spoil down gradient. Emphasis will be ensuring road runoff discharging from the culvert(s) does not scour and/or undermine the spoil sites.

Due to the steep terrain and rock features at sites D9, D10 and D11, there is potential to create unnecessary sediment release due to topsoil disturbance required to establish clean water diversions. As per HDC consent condition 56, a clean water diversion shall be constructed where there is a 'significant catchments' above the spoil disposal site. Due to the elevated position of the soil disposal sites D9, D10 and D11, and the fact that the road 'v' drain will intercept and rerouted upstream runoff away from the soil below; we do not consider these catchments as significant. Following the site specific workplan, silt fences will be installed on the downhill side of the soil disposal perimeter.

Depending on the grade, and the site will then be prepared by way of stripping the topsoil and using that as uphill bunding. Any soft soils from the surface will be stockpiled for landscaping use at a later date. Where necessary, steep slopes will be benched, and sub-surface drainage installed. The foundation of each spoil site will then be contoured and compacted if required. Supervision and sampling of this process will be carried out by Tonkin + Taylor Geotechnical Engineers. Particular attention will be made to the toe bund to prevent subsidence. The toe bund will be constructed of compacted soil of low organic matter to ensure structural integrity.

The spoil sites will upon completion be covered with original topsoil and vegetated with suitable ground cover. This will include non-invasive grass species or re-vegetated with silver tussock to no less than 20% cover, as soon as practicable after it has been fully utilised, in order to prevent scour and avoid sediment being washed into adjacent watercourses. Further information on the planting methodology will be provided following detailed design.

4.3.7 Works Near Waterways

There are no permanently flowing waterways within the project site however there are two areas where works will be within the riparian margin of ephemeral streams (refer Figure 6). Given waterways are not permanently flowing and works will be in dry conditions, diversions are generally not expected to be required, and if necessary due to significant rainfall events would be for a short duration. SSESCPs are to be developed for all works within riparian margins. No earthworks shall occur within active flow paths of water, areas of saturated soils, or where soils are unstable due to transient water content for the period of the rainfall and the following 12 hours after cessation of the rainfall.

5. Performance Inspection and Maintenance

5.1 Overview

Erosion and sediment control measures will be installed, maintained, monitored and audited throughout the contract works. Table 2 Outlines the performance inspection and maintenance requirements of the control measures put in place. An independent appropriately qualified person will be engaged by MCD to audit bulk earthwork activities on an as – required basis during construction to ensure that the sediment and erosion control measures are being constructed and maintained in accordance with this plan. This person will be approved by ECan's Regional Leader – Monitoring and Compliance as being competent and suitable to provide such certification. Confirmation of this appointment will be made in January 2023.

Meeting environmental compliance measures as outlined in the consent conditions relies heavily on the performance and maintenance of control measures. Much of the ability to prevent sediment laden runoff resides with the innovative K log channels. These devices have been specified due to their high performance with silt soils, the vast scale of the project site, and approach to minimise earthworks in order to construct larger, more conventional controls such as sedimentation ponds. To maximise their performance, topsoil and deeper clay samples from across the project site have been analysed and bench tested in the laboratory to ensure the PolyDADMAC organic coagulant concentration is calibrated correctly to the soil chemistry and particle size distribution. Results of this testing will be available in January 2023.

Control Measure	Performance Inspection and Maintenance	Frequency
Sediment Retention Ponds	In accordance with ESCT checklist 15	Daily, when > 5mm/hr of rain is forecast, and After Storm Event
Decanting Earth Bunds	In accordance with ESCT checklist 16	Daily, when > 5mm/hr of rain is forecast, and After Storm Event
Silt Fences	In accordance with ESCT checklist 17 and 18	Daily, when > 5mm/hr of rain is forecast, and After Storm Event
Diversion bunds, check dams and channels	In accordance with ESCT checklist 1, 2 and 3	Daily, when > 5mm/hr of rain is forecast, and After Storm Event
Stabilising areas	In accordance with ESCT checklist 6, 7, 8, 9, 10, 11, 12 and 13	Daily, when > 5mm/hr of rain is forecast, and After Storm Event
K-Log channels	In accordance with supplier recommendations	Daily or After Storm Event, replacement of flocculant media 2-3 times per year

Table 2 Performance inspection and maintenance plan.

Due to the use of the K-Log innovation, the earthworks Contractor will be supported by EnviroCo as proprietary owners of the K-log devices to ensure their performance. EnviroCo will also provide technical support and supply of replacement materials. MCWF's Project Engineers shall independently audit the erosion and control measures at monthly intervals at least twice per year during construction. The earthworks Contractor will also have their environmental team carrying out regular inspections of the controls and their environmental advisor carry out a monthly inspection as required in their procedures. For detailed device – specific inspection and maintenance checklists, refer to Appendix F.

To minimise the risk of significant sediment runoff from the construction works, the earthworks Contractor shall inspect and ensure effective functioning of devices daily and if rain is forecast with a total rainfall depth of greater than ten millimetres per 24 hours, or at an intensity exceeding five millimetres per hour.

5.1.1 Water Quality Monitoring

The monitoring will support an adaptive water management approach where it can provide feedback on the effectiveness of controls and the need for modified or additional controls. Water quality monitoring will be carried out by a suitably qualified person during construction and will include at least the following:

- Earthworks should be programmed based on weather outlook, i.e. if heavy rain are forecast, consideration should be given to delay or limit the earthworks;
- Visual inspections of the receiving environment while works are being undertaken i.e. looking for any noticeable changes in water clarity or colour between upstream and downstream of the works areas;
- Responding to deficiencies observed during inspections (e.g. modifying diversion/cut-off berms/canals, modifying erosion control measures, etc.); and
- De-silting the sediment control channels and /or bunds as required. The sediment control ponds will be cleaned out when sediment has accumulated to 20% of the total pond volume.

To meet conditions 28 - 35 of combined ECan consents CRC214152 and CRC214156 the following approach will be taken:

- Audited erosion and sediment control measures at least twice per calendar year during construction to ensure that the erosion and sediment control measures are constructed and maintained in accordance with the relevant SSESCP by the independent, suitably qualified person(s).
- Records of the audits and any resulting on-site amendments shall be kept and provided to Canterbury Regional Council, on request.
- Deploy a Total Suspended Solids (TSS) meter or any other recognised measuring device to determine the concentration of TSS in the discharge from representative sites. The TSS meter or measuring device shall be:
    - Used by a suitably qualified person in accordance with the manufacturer manual specific to the device used;
    - Calibrated to the soil and environmental conditions found on the site; and
    - Used in general accordance with the Erosion and Sediment Control Toolbox for Canterbury (2017).

- During works and when a discharge of construction phase stormwater is occurring from disturbed areas, the discharge from the site shall be visually assessed for any sheen of oil or grease or discolouration.
    - Observations shall be photographed and recorded; and
    - Records of visual assessments including photographs shall be kept and provided to Canterbury Regional Council on request.
- If the visual assessment and observations undertaken in accordance with Condition (29) indicate a direct overland flow connection from the activity to a surface waterway (not connected to any other activity or sources) which results in a decrease in visual clarity, water quality monitoring shall be undertaken to ensure compliance with Condition (3) in accordance with a method provided for under Condition (31).
- If the visual assessments and observations undertaken in accordance with condition (30) indicate a sheen of oil or grease or discolouration. If the water quality monitoring required by condition (31) identifies an exceedance of the TSS limit in condition (3)(c), then:
    - The discharge shall cease immediately;
    - The discharge shall only recommence once amendments have been made to the treatment process such that:
        - A TSS concentration of 100 milligrams per litre in the treated discharge is achieved; and
        - The source of the sheen of oil or grease or discolouration has been removed.
- MCWF shall maintain a record of any water quality monitoring undertaken in accordance with condition (31) and any of the actions undertaken in accordance with condition (32). This record shall be provided to the Canterbury Regional Council on request.
- Once a year during the period of construction and for one year following the completion of construction activities, the Consent Holder shall undertake the following monitoring:
    - The monitoring shall be carried out by a suitably qualified person at the following NZTM locations shown on Plan CRC214152D, attached to and forming part of this consent:
        - 1589202E, 5230108N (Dovedale);
        - 1587336E, 5229983N (Cass Middle);
        - 1586490E, 5229918N (Homestead); and
        - 1588492E, 5232496SN (Mothering Gully stream)
    - Water quality shall be monitored in terms of:
        - Suspended and dissolved water quality measures, including hydrocarbon indicators which detect the presence of fuel, hydraulic oils and lubricants; and
        - Deposited fine sediment surveys (following the procedures set out in pages 17-20 Clapcott et al (2011)
    - Results of the sampling shall be compared with the following alert trigger water quality measures - Schedule 5, Table S5A/B 'Hill fed lower' If there is more than 20% increase on past survey results
        - for:
        - Temperature
        - pH
        - Visual clarify
        - Total Petroleum Hydrocarbons (TPH)

        - Poly Aromatic Hydrocarbons (PAH)
    - Should any sample results record above water quality or deposited sediment alert triggers in Condition (34)(c) (I and ii) the following actions shall be undertaken
        - The on-site controls are to be inspected and where additional controls are required these are implemented; and
        - Sampling set out in Condition (34)(a) to (34)(b) shall be repeated one month after any alert trigger level exceedances.
    - Should three consecutive follow up monitoring rounds required by Condition (34) (d) (i) have results which exceed the alert level triggers the following actions shall be undertaken:
        - Notification of the exceedances to Canterbury Regional Council, Attention: Regional Leader – Monitoring and Compliance
        - An investigation into the water quality effects shall be undertaken and shall include the following:
            - Determine if the exceedances are a result of the discharges of stormwater from the site
            - Identify the risk by the environment from the exceedances;
            - Identify and undertake mitigation and actions to prevent further exceedances (this could include flushing of any deposited sediment from the site); and
            - Provide a report within 3 month(s) to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, that documents the investigation.
- MCWF will submit laboratory results for all water quality samples collected as per Conditions (32) to Canterbury Regional Council, Attention, RMA Compliance and Enforcement Manager within five working days of the laboratory results being reported to the consent holder. The data shall be provided in a format suitable for electronic upload to the Council's water quality database.

5.1.2 Post Construction

In the event of MCWF or its contractors ceasing work on-site, adequate preventative and remedial measures shall be taken to control sediment discharged exposed or unconsolidated surfaces. These measures shall be maintained for so long as necessary to prevent sediment discharges from the earth worked areas.

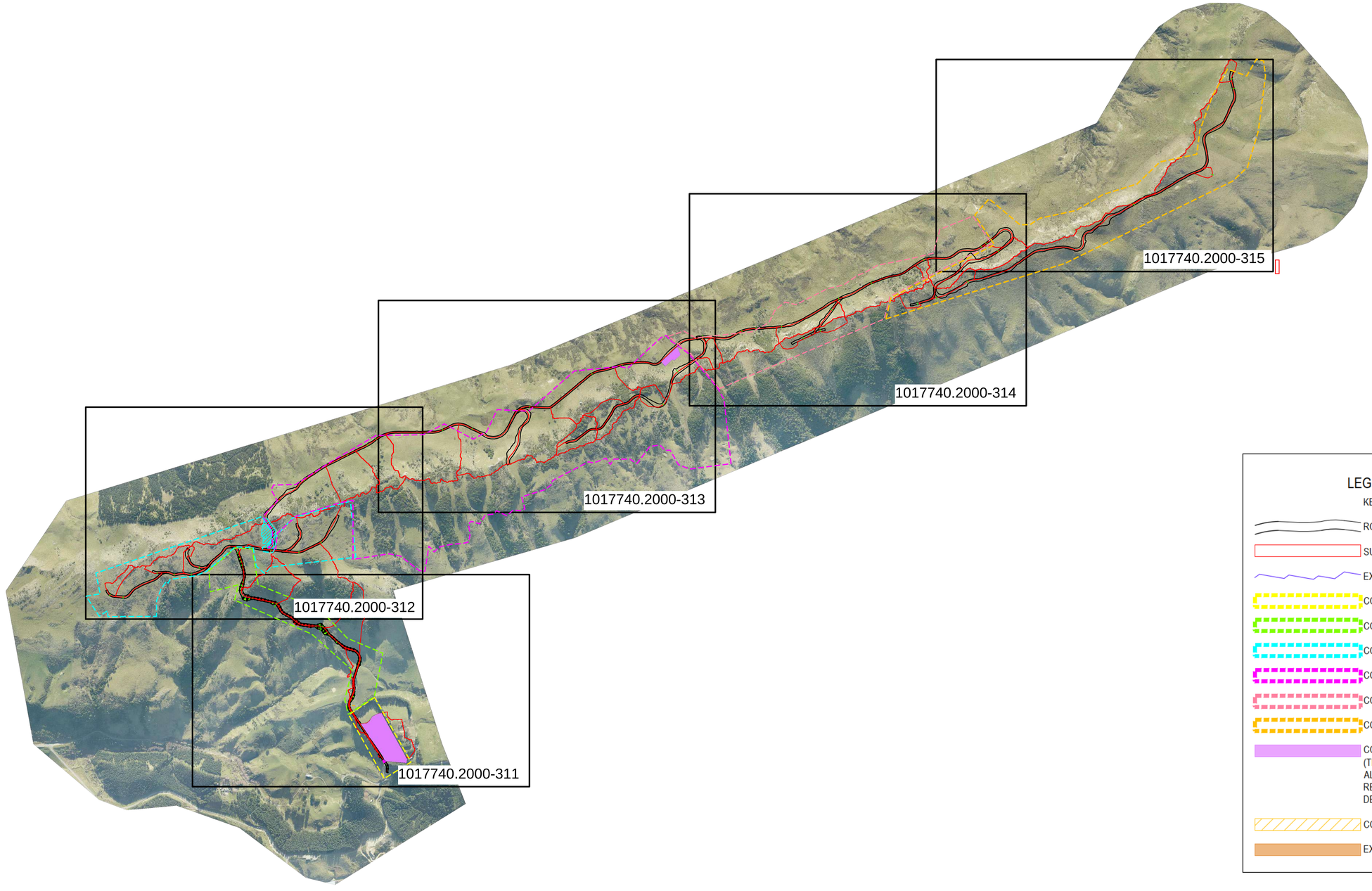
All erosion and sediment control measures shall not be decommissioned until the works area is stabilised. Decommissioning measures shall be undertaken in the following order:

- All disturbed areas shall be stabilised and/or re-vegetated following completion of the works to achieve vegetation cover that is effective at minimising sediment run-off;
- Any visible debris, litter, sediment and hydrocarbons shall be removed from all sediment control measures; and
- Erosion and sediment control measures shall be removed.
- Any material removed in accordance with Condition (23)(b) shall be disposed of at a facility authorised to receive such material.

6. Appendices

Appendix	Description
A	ESCP Drawings and Standard Details
B	Consent Conditions
C	Catchment Areas and Flow Rates
D	Sink Hole Locations
E	ECan Toolbox Checklists
F	Sub Catchment Extents and Labels
G	Construction Sequence Dates
H	K Log channel standard Detail

APPENDIX A – ESCP Drawings and Standard Details



LEGEND

KEY LEGEND:

- ROAD ALIGNMENT
- SUB CATCHMENT
- EXISTING FLOW PATHS
- CONSTRUCTION STAGE 1
- CONSTRUCTION STAGE 2
- CONSTRUCTION STAGE 3
- CONSTRUCTION STAGE 4
- CONSTRUCTION STAGE 5
- CONSTRUCTION STAGE 6
- CONSENTED LAYDOWN AREAS (THE NUMBER, LOCATION, AND SIZE OF ALL OF THESE AREAS WILL NEED TO BE REVISITED WITH MCD AND SGRE TO DETERMINE WHAT'S NEEDED)
- CONSENTED DISPOSAL SITES
- EXCLUSION ZONES

A3 SCALE 1:25000
0 0.5 1.0 1.5 (km)
ORIGINAL IN COLOUR

REV	DESCRIPTION	CONSULTANT/CONTRACTOR NAME	DSN	DRN	CHK	APP	DATE	CLIENT APP	DATE
1	80% DETAILED DESIGN	BRTI	BRTI	JOAB	BRTI		DEC 22		DEC 22

DRAWN	JOAB	DEC 22
DESIGNED	BRTI	DEC 22
CHECKED	CAPA	DEC 22
APPROVED		DEC 22
CAD FILE		

McCONNELL DOWELL
Tonkin+Taylor
icubed consulting

Mt Cass Wind Farm

McCONNELL DOWELL

MT CASS WINDFARM DETAILED DESIGN - 80%
EROSION AND SEDIMENT CONTROL
ESC - SHEET 1

DRG.SIZE	SCALE
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DRAWING NUMBER	SHEET	REVISION
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SOURCE FILE NAME
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1:2 0 20 40 60 80 100 120 140 160 180 200
1:5 0 100 200 300 400 500

DIRTY WATER DIVERSION BUND
WESTERN ROAD
SEDIMENT TRAP
SEDIMENT TRAP
ENERGY DISSIPATION RIPRAP
1017740.2000-312
SITE ACESS ROAD
DIVERSION BUND
K-LOG CHANNEL
ENERGY DISSIPATION RIPRAP
SEDIMENT TRAP
SEDIMENT TRAP
CLEAN WATER DIVERSION BUND
D1
SEDIMENT DECANT EARTH BUND
SILT FENCE
SEDIMENT DECANT EARTH BUND
K-LOG CHANNEL
L2
STABILISED ENTRANCE
MAIN ENTRANCE
1017740.2000-311
A3 SCALE 1:5000
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ORIGINAL IN COLOUR

LEGEND

KEY LEGEND:

- ROAD ALIGNMENT
- SUB CATCHMENT
- EXISTING FLOW PATHS
- CONSTRUCTION STAGE 1
- CONSTRUCTION STAGE 2
- CONSTRUCTION STAGE 3
- CONSTRUCTION STAGE 4
- CONSTRUCTION STAGE 5
- CONSTRUCTION STAGE 6
- CONSENTED LAYDOWN AREAS (THE NUMBER, LOCATION, AND SIZE OF ALL OF THESE AREAS WILL NEED TO BE REVISITED WITH MCD AND SGRE TO DETERMINE WHAT'S NEEDED)
- CONSENTED DISPOSAL SITES
- EXCLUSION ZONES
- 22V STORMWATER SUMP
- STORMWATER CULVERT

LEGEND

ESCP LEGEND:

- CW CLEAN WATER DIVERSION BUND REFER TO DRAWING 1017740.1000-320
- DIRTY WATER DIVERSION CHANNEL REFER TO DRAWING 1017740.1000-320
- CONTOUR/ CUT OFF DRAIN REFER TO DRAWING 1017740.1000-321
- CHECK DAM REFER TO DRAWING 1017740.1000-322
- SILT FENCE REFER TO DRAWING 1017740.1000-323
- SEDIMENT DECANT EARTH BUND REFER TO DRAWING 1017740.1000-325
- SEDIMENT RETENTION POND REFER TO DRAWING 1017740.1000-325
- STABILISED ENTRANCE REFER TO DRAWING 1017740.1000-326
- SURFACE ROUGHENING REFER TO DRAWING 1017740.1000-327
- K-LOG CHANNEL
- ENERGY DISSIPATION RIPRAP
- SEDIMENT TRAP

REV	DESCRIPTION	CONSULTANT/CONTRACTOR NAME	DSN	DRN	CHK	APP	DATE	CLIENT APP	DATE
1	80% DETAILED DESIGN	BRTI	BRTI	JOAB	BRTI		DEC 22		DEC 22

DRAWN	JOAB	DEC 22
DESIGNED	BRTI	DEC 22
CHECKED	CAPA	DEC 22
APPROVED		DEC 22
CAD FILE		

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McCONNELL DOWELL

MT CASS WINDFARM DETAILED DESIGN - 80%
EROSION AND SEDIMENT CONTROL
ESC - SHEET 2

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