Draft Environmental Construction Management Plan

Puke Kapo Hau Mahinerangi Wind Farm Stage 2, Otago

RILEY

Draft Environmental Construction Management Plan

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Contents

Appendices (attached separately)

Other Attachments (provided by others) list subject to confirmation:

Appendix A: Draft Earthworks Management Plan (EMP) incl Erosion and Sediment Control Plan
Appendix B: Draft Chemical Treatment Management Plan
Appendix C: Site Development Plan
Appendix D: Fire Management Plan
Appendix E: Construction Noise Management Plan
Appendix F: Construction Traffic Management Plan
Appendix G: Rehabilitation Management Plan
Appendix H: Environmental Monitoring Plan and Report
Appendix I: Ecological Monitoring and Management Plan

PART A Introduction

Tararua Wind Power (TWP), a fully owned subsidiary of Mercury NZ Limited, is progressing Stage 2 of the Mahinerangi Wind Farm which is to be known as "Puke Kapo Hau" ("the Project", "Puke Kapo Hau" or "MWF2").

1.0 Stage 1 ECMP

In accordance with Condition 25A of the District Land Use Consent, an Environmental Construction Management Plan (ECMP) was prepared by Trustpower in 2010 (the consent holder at the time) for Stage 1 of the wind farm. The Stage 1 ECMP has been used as a template for development of this Stage 2 ECMP.

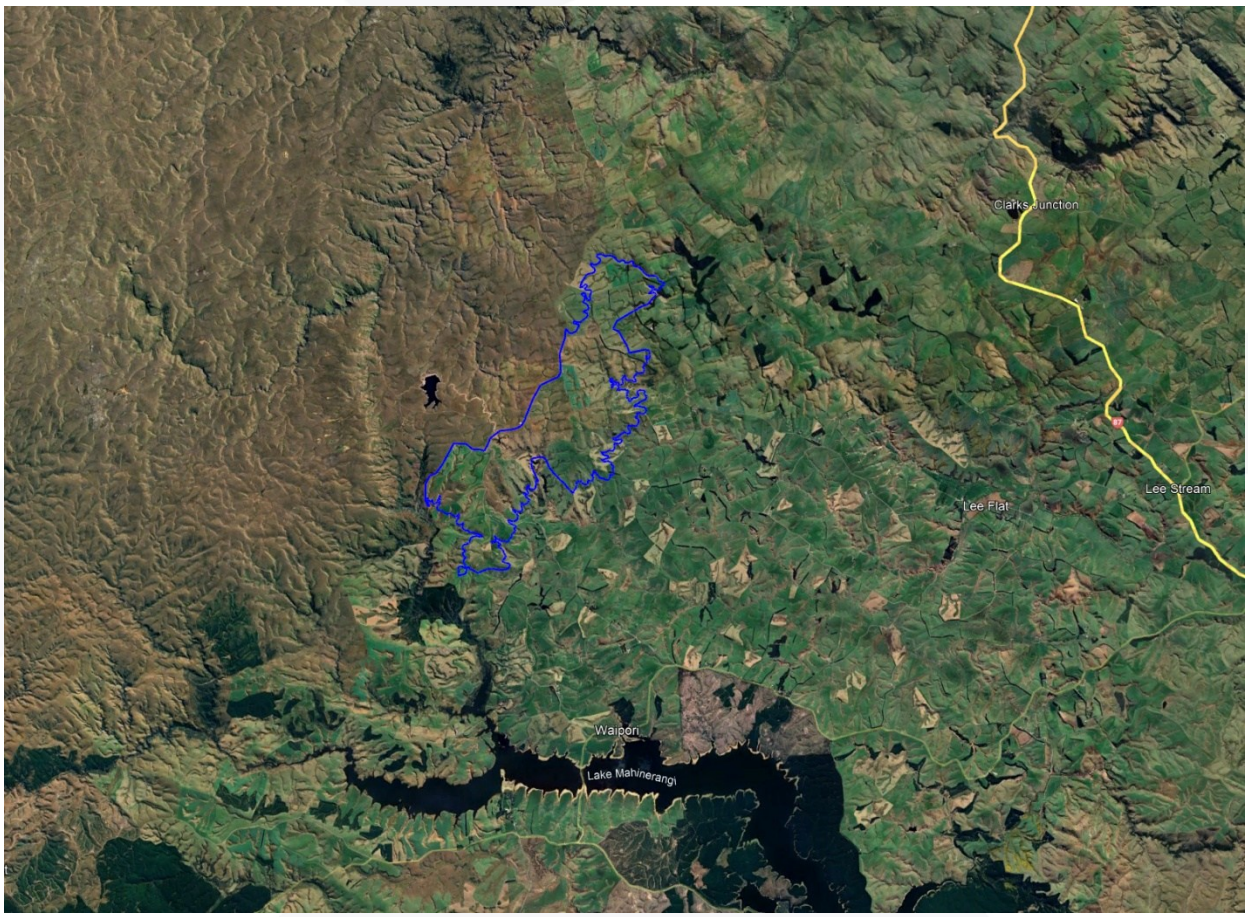

Figure 1: Wind Farm Location Map (topo map with the wind farm site boundary shown in blue)

2.0 Scope and Structure of the Plan

The ECMP provides for the environmental management, through the establishment of management procedures, for all activities associated with the construction of MWF2.

The ECMP is structured as follows:

- ***Part A – Introduction.*** This part of the ECMP introduces, and establishes, the context for the Plan that follows. It also:
  - Provides an overview of the scope and structure of the Plan.
  - Establishes environmental objectives for the construction of the MWF2.
  - Outlines the manner in which the ECMP will be implemented.
  - Identifies key project personnel and responsibilities.

- ***Part B – Environmental Construction Management Plan Main Body.*** The main body of the ECMP provides management procedures for construction related activities, not covered elsewhere in this document or separate management plans, that have the potential to affect the environment.
- ***Part C – Appendices – Site Development Plan and Separate Management Plans***

3.0 The Project

Tararua Wind Power Ltd. (TWP) is intending to construct MWF2 in a staged approach. MWF2 is located approximately 50 km west of Dunedin and to the north of Lake Mahinerangi.

The original resource consents for the proposed MWF2 were sought, and granted, based on a development envelope approach consisting of:

- A 1,723 hectare area of land.
- A maximum installed capacity of up to 200 MW.
- A maximum turbine height, to the tip of the blade, of 145 metres.
- A maximum of 100 turbines.

Following the granting of resource consent, 12 3 MW turbines were constructed as Stage 1, along with a switchyard, overhead power lines, and Operations and Maintenance building.

MWF2 consents allow for construction of the following infrastructure within a 1,570 hectare are of land (hereafter referred to as the site):

- 44 turbines (providing an additional 190MW total capacity) including access tracks and hardstands
- Battery Energy Storage System (BESS)
- A new Operations and Maintenance Facility
- Substation
- Overhead 110kv transmission line

- Temporary concrete batching plant and construction site compounds

Construction of MWF2 will involve, amongst other activities, the following:

- The movement of vehicles, including heavy vehicles, to, from and throughout the site;
- Machinery use, including heavy machinery, at the site;
- Earthworks to form access tracks and handstand platforms;
- Establishment of fill disposal areas;
- The establishment and operation of an on-site concrete batching plant/s;
- Pavement construction;
- Water management, treatment and disposal systems for all contaminated water generated at the site;
- Construction of temporary erosion and sediment control devices; and
- Reinstatement of disturbed areas.

This document is the Environmental Construction Management Plan which establishes management procedures for all parties to follow when undertaking activities associated in the construction of MWF2.

4.0 Objective of the ECMP

This ECMP describes the procedures for project staff to follow, and control measures to be implemented; to comply with the conditions of consent and to appropriately avoid, remedy, or mitigate, offset or compensate any adverse environmental effects of the construction works authorised by the Resource Consents. Specifically, the ECMP (and supporting management plans) shall provide for the following objectives in accordance with the conditions of consent:

(a) To minimise the overall area of disturbance, so as to reduce the potential impact on fauna, flora and waterways.

(b) To minimise the sediment generation and sediment laden runoff.

(c) To ensure that appropriate monitoring and reporting of all activities is undertaken in accordance with the Resource Consent conditions.

(d) To ensure that the earthworks associated with the construction of the access tracks be contoured so that, to the greatest extent practicable, they will blend the tracking with the surrounding landscape;

(e) To ensure that the earthworks are undertaken in a manner that provides for final surfaces which are suitable for rehabilitation.

(f) To ensure that the areas of fill disposal are contoured so that, to the greatest extent practicable, they blend with the surrounding landform;

(g) To ensure that the design and appearance of the switch station for Stage 1, and the substation for Stage 2 are appropriately located within the environment.

(h) To ensure that the earthworks associated with the construction of the turbine, hard stand areas and any other landing and lay-by sites will be contoured to blend with the surrounding landform.

This ECMP is to be submitted to the Planning and Environment Manager of the Clutha District Council (CDC) for certification at least one month prior to construction works starting on site. Works shall not commence on-site until certification of the Management Plans has been received by the consent holder.

Relevant regional and district plans, guidelines, and applicable resource consents have been considered when preparing this plan.

5.0 Supporting Documentation

As required by the conditions of consent, additional management plans have been prepared and are included separately with the application. These are:

- Earthworks Management Plan (EMP) incl Erosion and Sediment Control Plan (ESCP).
- Fire Management Plan
- Construction Noise Management Plan
- Construction Traffic Management Plan
- Ecological Monitoring and Management Plan
- Archaeological Management Plan

6.0 Proposed Development

As described above, the wind farm layout and design has been based on an indicative turbine specification having a 4.3MW capacity and a rotor diameter of 136m and minimum ground clearance of 20m. The Project will include the following key features:

- Roading (access track – internal) network that will provide vehicular access to the Turbine locations during and following construction, with various connections from Eldorado Track. Tracks will be an unsealed granular pavement with a minimum width of 5.5m and additional widening at bends to accommodate Turbine component delivery vehicle swept paths.
- Turbine platform/hardstand areas are required for storage of components and placement and erection of the crane for installation. The main (hardstand) portion is retained as a gravel pad for future Turbine maintenance activities.
- Electrical reticulation, consisting of underground cables between the Turbines and the substation
- A substation, occupying an area approximately 0.68ha, located within the site, to collect the power generated by the Turbines.
- A BESS, to temporarily store surplus power, occupying an area approx. 0.42ha.

- An overhead 110kV transmission line between the substation and existing overhead power lines located to the south of the site adjacent to Eldorado Track. The main section of overhead lines will feature up to 25 pole/tower structures up to 45m in height. Consent is sought to locate the lines/poles within a 100m wide corridor, measured 50m either side of the indicative route, subject to any environmental constraints.
- Access tracks will be formed to provide maintenance access to each structure location. Both the transmission line corridor and access tracks take into account wetlands and ecologically sensitive areas (for example rocky outcrops or snow tussock grassland) and avoid such areas where practicable.
- Operations and maintenance (O&M) facility, approximately 2,200m^2 (including 700m^2 of buildings), indicative sizing is based on the Kaiwera Downs Wind Farm Stage 2 O&M.

7.0 Plan Implementation

7.1 Overview

TWP as the consent holder, is responsible for ensuring the overall implementation of the ECMP.

The day-to-day operation, implementation, and thus compliance with the ECMP, is the responsibility of the Contractor in accordance with the construction contract. The Contractor is to ensure compliance with the Resource Consents issued by Otago Regional Council (ORC) and/or CDC, and the effective implementation of the ECMP.

7.2 Plan Induction Procedure

All site personnel (i.e. contractor and subcontractors) at the MWF2 site, as well as visitors, are required to have completed an induction programme, where the scope is appropriate for the tasks and/or role of individual/s, covering the requirements of the ECMP. The purpose of the induction programme will be to ensure that personnel play an effective role in ensuring that the requirements of the ECMP are complied with.

Where visitors or other personnel to site have not completed an induction programme, they shall be accompanied at all times by personnel who have.

The induction programme is to be conducted by the Environmental Officer/s, or other personnel delegated and trained to undertake the task.

7.3 Hours of Work

General work hours will be between 6:00 am - 10 pm Monday to Saturday and concrete shall not be manufactured outside the hours of 4a.m. to 10p.m as per the conditions of consent. Work outside of these hours may also be undertaken where required as permitted by the conditions.

Examples of early morning and late-night activities may include:

- Significant concrete pours

- Erection and dismantling of temporary plant and equipment (e.g. Cranes, site facilities)
- Work that has been accelerated
- Planned shift work including possible turbine installation
- Delivery of over dimensional loads (such as turbine components).

Construction noise will be appropriately addressed for all works undertaken outside general working hours to ensure potential adverse effects are managed appropriately. Refer to the Construction Noise Management Plan (CNMP) at Appendix G for additional information.

7.4 Key Project Personnel Contact Details

A. [to be inserted at future date]

B.

C.

7.5 Construction Programme

A. [Stages of work and estimated start date and durations to be inserted at future date]

7.6 Roles and Responsibilities

Example of key management roles of project staff relevant to environmental management for the project:

Role	Responsibility
Project Director/Manager	• Ensure the ECMP is prepared and certified prior to the commencement of construction activities. • Monitors the implementation of the plan and the achievement of objectives; • Takes ultimate responsibility for compliance with the specification and regulatory requirements (i.e. resource consent or archaeological authority conditions); • Ensures employees and subcontractors are adequately inducted and trained in site environmental and sustainability procedures including emergency procedures; • Ensures adequate resources are available to meet environmental and stakeholder obligations; • Provides leadership to ensure all employees and subcontractors comply with the project management plans; • Coordinates environmental and sustainability management interfaces with the Environmental Manager, external agencies and stakeholders, and • Notifies the Client's Representative and regulatory authorities of any non-compliances.

Role	Responsibility
Environmental Officer (Project Engineer/Supervisor/ Foreman)	• Ensure all personnel at the MWF2 site, whether employees or not, have been inducted, to an appropriate level, on the requirements of the ECMP. • Ensure that all activities undertaken as part of the construction of the MWF2 are undertaken in accordance with the ECMP and environmental best practice. • Development, and implementation, for all site personnel of an induction programme which covers the requirements of the ECMP. • Development, and maintenance of an information management system, in relation to the matters related to the ECMP. • Report, on a monthly basis, on the implementation of the ECMP, and other related matters, to the Engineer to the construction contract and to TWP's Environmental Manager. • Ensure that all complaints in relation to environmental performance are followed up in a timely manner with corrective action undertaken, as appropriate. • On an ongoing basis audit all construction activities against the ECMP. • Undertaken corrective actions, as appropriate, to ensure the all construction activities comply with the requirements of the ECMP. • Continually review the effectiveness of the ECMP in terms of meeting the purpose of the ECMP. If necessary, revise or develop new management procedures that more effectively meet the purpose of the ECMP. Any amendments to the ECMP are to be submitted to the Engineer for approval prior to implementation.
Environmental Representative	• Undertakes/co-ordinates environmental monitoring and inspections as required; • Tracks and records compliance with regulatory requirements, • Maintains environmental risk register; • Stocking of spill kits, and • Environmental champion at share meetings and other site opportunities.
All Employees and Subcontractors	• Reports all environmental incidents and observations promptly to supervisory staff; • Carrys out routine maintenance and emergency work when directed; • Cares for all environmental controls; • Follows environmental procedures and sustainability practices in all activities undertaken, and • Ensure the site is kept tidy and litter is placed in bins.

8.0 Project Regulatory Approvals

[To be completed at a later date]

Table 1: Project Regulatory Approvals

Consent Holder	Regulatory Authority	Consent Number	Consent Type	Purpose

Table 1: Key Consent Requirements Relevant to Construction Phase

Consent Number	Condition Number	Requirement	Timeframe

PART B Environmental Construction Management Plan

1.0 Introduction

1.1 Purpose

Construction activities associated with the MWF2, which are covered under Part B of this report, are as follows:

- Archaeological considerations
- Establishment of site controls.
- Construction water and potable water supply.
- Wash down water from site facilities.
- Dust management.
- Solid waste management.
- Management of hazardous substances.
- Stormwater and Water Quality.

2.0 Management Procedures

2.1 Archaeological Considerations

The following procedures shall be followed to ensure that archaeological sites are not adversely affected by the construction of the MWF2.

2.1.1 Establishment Phase

Establishment phase management procedures, which are to be completed at the commencement of the construction activity and/or any subsequent phase of the construction activity, are as follows:

A. Develop the Accidental Discovery Protocol in consultation with both Te Rūnaka o Ōtākou and Heritage New Zealand prior to construction commencing. All parties are to agree to the procedures contained within the Accidental Discovery Protocol.

B. Undertake training of all site personnel involved in site disturbance activities to enable them to identify archaeological sites and/or artefacts should they accidentally discover any during construction of the MWF2. The training should also include guidance on the requirements of the Accidental Discovery Protocol should such sites be discovered.

C. Identify and define (i.e. fence, or tape or other appropriate approach) any archaeological sites within the vicinity of any proposed construction work but which are to be excluded from the defined construction area.

2.1.2 Activity Phase

Activity phase management procedures, which are to take place throughout the construction of the MWF2, are as follows:

A. All site personnel involved in site disturbance activities are to be trained in the identification of archaeological artefacts and/or sites.

B. Should an unknown archaeological site be discovered during the construction of theMWF2 all work within 50m of the discovery is to cease immediately and the requirements of the Accidental Discovery Protocol are to be followed.

2.2 Site Controls

To ensure that the potential effects associated with the construction of the MWF2 are contained within the defined project area and remain outside of exclusion zones to the extent practicable, the following procedures shall be followed:

2.2.1 Establishment Phase

Establishment phase management procedures, which are to be completed at the commencement of the construction activities, and/or any subsequent phase of the construction activities, are as follows:

A. Identify and mark on-site exclusion zones (such as wetlands located outside the approved earthworks footprint). Markings shall be of a suitable quality so that it presents a visible

barrier to any contractors or machinery. The project boundary shall be identified on all relevant site drawings and plans.

B. Earthworks machinery fitted with GPS guidance systems shall have the exclusion/buffer zones loaded into the software.

2.2.2 Activity Phase

Activity phase management procedures, which are to take place throughout the construction of the MWF2, are as follows:

A. The construction and exclusion/buffer zones are to be clearly identified at all times. Should any temporary fencing or 'markings' defining these zones be removed or damaged at any time during construction they are to be reinstated, in the correct position, immediately.

B. No construction activity, including the movement of vehicles and the storage of materials, is to extend beyond the defined construction zone.

2.2.3 Rehabilitation Phase

A. Following completion of the project (or project stage) the boundary markers shall be removed.

2.3 Water Supply and Wastewater

Water will be required for construction activities, including conditioning of earth fill, pavement construction, dust suppression during earthworks operations, and concrete production for Turbine foundations.

There are no suitable/reliable on-site water sources to supply the water needed during construction activities, therefore water will be sourced offsite and trucked in via water tankers and stored in temporary above ground water tanks.

The water reservoirs associated with the Deep Stream Hydro Project (one of which is located close to the site entrance) are owned and operated by Manawa Energy (now Contact Energy) and therefore are not available to take water from.

Water conservation is of increasing importance due to increasing instances of regional drought and the general scarcity of water. The measures that will be employed to conserve water during construction are listed below.

2.3.1 Establishment Phase

Establishment phase outlines management procedures, which are to be completed at the commencement of the construction activity, and/or any subsequent phase of the construction activity, are as follows:

A. Establish roof rainwater collection system for the site offices, i.e. above ground tanks, for potable water supply during construction. The tank/s will be topped up with imported

potable water during extended dry periods. The tank/s may be repurposed for the permanent Operations and Maintenance building post-construction.

B. Establish on-site wastewater treatment and disposal system to service the site's construction facilities, or alternatively temporarily store and remove waste from site to an appropriate facility.

2.3.2 Activity Phase

Activity phase management procedures which are to take place throughout the construction of the MWF2, are as follows:

A. Use/import non-potable water sources for dust suppression activities, where practicable.

B. Have trigger controls on all hoses

2.3.3 Rehabilitation Phase

Rehabilitation phase management procedures are to be undertaken upon completion of the construction of the MWF2. The management procedures are:

A. Decommission and remove from site all temporary water supply and wastewater disposal facilities.

B. Ensure that the areas affected by the decommissioning of the facilities are rehabilitated.

2.4 Wash Down Water

To ensure the discharge of any potential contaminants into waterbodies is avoided/minimised, the following procedures shall be followed:

2.4.1 Establishment Phase

Establishment phase management procedures, which are to be completed at the commencement of the construction activity, and/or any subsequent phase of the construction activity, are as follows:

A. Planning of wash down water control measures from site facilities shall occur prior to the commencement of activities requiring wash down (i.e. the concrete batching plant and the vehicle wash down station). The measures shall ensure that:

   i. Wash down water is intercepted and treated, wherever practicable.

   ii. The design of wash down water treatment facilities is to provide appropriate capacity and level of treatment as reflected by best practice.

   iii. Wash down of concrete trucks shall only be undertaken within the batching plant compound and all runoff is to be directed straight into a lined containment area (refer Section 3.1 below for further details).

   iv. Treated wash down water is to be discharged to land and not directly into waterbodies.

v. All wash down water control measures, and associated discharges shall be undertaken so as not to cause erosion.

The above planning shall be undertaken for each staged component of the earthworks.

2.4.2 Activity Phase

Activity phase management procedures, which are to take place throughout the construction of the MWF2, are as follows:

A. Installation of the planned wash down water control measures prior to the wash down of any site facilities commencing.

B. Daily inspection of the control measures and surrounding vicinity in order to confirm that the measures are achieving their purpose. This includes determining that there are no uncontrolled discharges to waterbodies.

C. If following any daily inspection, or at any other time, it is evident that the control measures are not working appropriately, immediately undertake any necessary maintenance and/or other appropriate measure in order to ensure the ongoing and future effectiveness of the control measure.

2.4.3 Rehabilitation Phase

Rehabilitation phase management procedures are to be undertaken upon completion of the construction of the MWF2 and/or as specific phases of construction - where water wash down takes place.

These procedures can also be undertaken progressively, if appropriate. The management procedures are:

A. Decommission and remove from the area all wash down water control measures that are not permanent features of the facility, once they are no longer required.

B. Ensure that the areas affected by the decommissioning of the wash down water control measures are rehabilitated.

2.5 Dust Management

To mitigate the risk of potential discharge of contaminants to the air beyond the project site during batching plant operations, the following procedures shall be followed. Further information regarding dust management for general earthworks operation is addressed in the Earthworks Management Plan attached as Appendix A.

2.5.1 Establishment and Activity Phase

Mitigation measures to be incorporated into the batching plant design/construction/and operational procedures shall include but not be limited to:

- Stockpiles of sand and aggregates shall be managed to ensure they do not become a source of dust. This may be achieved by storing them in bunkers shielded from three sides, and/or keeping them in a moist condition via sprinklers.
- Ensure trafficked surfaces do not become a source of dust by keeping in a moist condition.
- Cement shall be stored in sealed silos. Delivery of cement to the silos will be via pneumatic transfer from the delivery vehicles.
- Silos and weigh hoppers shall incorporate fabric filter dust collection systems to control dust emissions during filling operations.
- Conveyor transfer points and hopper discharge points should be covered or enclosed.
- If following any daily inspection, or at any other time, it is evident that the control measures are not working appropriately, immediately undertake any necessary maintenance and/or other appropriate measure in order to ensure the ongoing and future effectiveness of the control measure.

2.6 Solid Waste Management

The following procedures shall be followed to manage all solid waste associated with the construction activity, such that adverse effects on the environment are avoided:

2.6.1 Establishment Phase

Establishment phase management procedures, which are to be completed at the commencement of the construction activity, and/or any subsequent phase of the construction activity, are as follows:

A. Planning of solid waste management measures shall occur prior to the construction commencing. The measures shall ensure that:
    i. Reduction, reusing, recovering, recycling of materials is provided for.
    ii. Disposal methods for all unwanted solid waste are identified.
    iii. Identification of appropriate receptacles, all of which are to be covered, and associated site signage, for various materials.
    iv. Identification of appropriate locations for these receptacles.
    v. All unwanted solid waste is disposed of at appropriate facilities and not at the MWF2 site.

B. Undertake training, as part of the ECMP induction programme, of all site personnel about the appropriate methods of solid waste management for all components of the waste stream.

2.6.2 Activity Phase

Activity phase management procedures, which are to take place throughout the construction of the MWF2, are as follows:

A. Installation of the planned solid waste management measures, including signage providing instruction on how to use the facilities, prior to construction commencing. The location of these facilities may need to be moved to accommodate the movement of the construction activity.

B. Littering of any material is not to occur. All material is to be deposited at the receptacle facilities provided, which is appropriate for the nature of the material.

C. Daily and/or weekly inspection of the control measures, as appropriate and in the surrounding vicinity in order to confirm that the measures are achieving their purpose. This includes determining that the receptacles are being used for the appropriate waste, that sufficient facilities are being provided and that the receptacles are being cleaned out, as appropriate.

D. If following any inspection, or at any other time, it is evident that the control measures are not working appropriately, immediately undertake any necessary maintenance and/or other appropriate measure in order to ensure the ongoing and future effectiveness of the control measure.

E. All solid waste material is to be disposed of off-site at an appropriate facility. No burning of waste is permitted.

2.6.3 Rehabilitation Phase

Rehabilitation phase management procedures are to be undertaken upon completion of the construction of the MWF2 and/or as specific phases of construction - where solid waste management facilities are used. These procedures can also be undertaken progressively, if appropriate. The management procedures are:

A. Decommission and remove from the area all control measures that are not permanent features of the facility once they are no longer required. Ensure that all unwanted solid waste material has been removed from the site.

2.7 Hazardous Substances

To prevent unplanned or uncontrolled releases to the environment, the following procedures shall be followed:

2.7.1 Establishment Phase

Establishment phase management procedures, which are to be completed at the commencement of the construction activity, and/or any subsequent phase of the construction activity, are as follows:

A. The Contractor shall construct a secure enclosed facility for the storage of hazardous substances. This store shall meet all the legislative requirements for such facilities. It will also ensure that the surrounding environment is protected should there be any spillages within the facility.

B. Prior to any hazardous substances being brought to site, the Environmental Officer shall review and retain a copy of the relevant Material Safety Data Sheet (MSDS). Any specific requirements in relation to the storage, use and disposal of the substances, as identified in the MSDS, shall be provided for at the site prior to the arrival of substance.

C. For all hazardous substances to be used during the construction of the MWF2, contingency planning is to take place. The purpose of this planning will be to ensure that best practice is incorporated into all aspects of its storage, use and disposal. An example of best practice during the use of such substances includes ensuring that containment facilities are provided should there be an unplanned spill (e.g. bunding or during temporary use, the use of a protective barrier such as polythene sheet or bin), and spill response kits are readily available.

D. The Contractor shall ensure that all personnel using hazardous substances are trained and qualified to do so. This training shall also ensure that appropriate personnel are trained in the storage as well as disposal of such substances.

B. A Hazardous Substance Register will be developed for the site identifying the total volumes of fuel and chemicals on site. Safety Data Sheets (SDS) will be available with the Hazardous Substances register.

2.7.2 Activity Phase

Activity phase management procedures, which are to take place throughout the construction of the MWF2, are as follows:

A. MSDS are to be readily accessible for all site personnel using hazardous substances.

B. Ensure all hazardous substances, whether in storage or being used, are 'separated' from the environment. This means that stored substances are to be stored in the storage facility or other approved storage area while substances being used are to provide some form of bunding or barrier.

C. Weekly inspection of the hazardous substance control measures as appropriate and in the surrounding vicinity in order to confirm that the measures are achieving their purpose.

D. If following any inspection, or at any other time, it is evident that the control measures are not working appropriately, immediately undertake any necessary maintenance and/or other appropriate measure in order to ensure the ongoing and future effectiveness of the control measure.

E. All unwanted hazardous substances, including empty containers are to be disposed of off-site at an approved facility and/or in an approved manner.

The following is a description of the measures to be undertaken to minimise the potential adverse effects in the unlikely event of cement spillage at the concrete batching plant(s):

- The batching plant(s) shall be founded on compacted hardfill material to create a competent working platform and reduce the perviousness of the area.
- The batching plant(s) are to have a stabilised earth bund constructed around its perimeter to divert cleanwater runoff and contain sediment laden runoff.
- A containment area (sediment pond) shall be constructed to capture runoff and provide sufficient settlement of sediments prior to discharge to the downstream environment. The containment area shall be lined to prevent any water seepage into the natural ground. The pond shall be designed in accordance with GD05.
- The outlet from the pond shall be controlled by a manually operated valve; if there is spilling of cement in the concrete batching plant area the valve will be temporarily shut until the spillage is removed.
- Operation and monitoring of the pond and discharges are to be carried out in accordance with the procedures outlined in the EMP.
- Following significant rainfall events the Environmental Officer will arrange for the water in the pond to be tested and pH measured. Best practice guidelines state that a pH of between 6.0 and 9.0 is acceptable for discharge. If required the water will be chemically treated to reduce the pH to acceptable levels such that clean water can be discharged. Discharge should also be visually inspected to ensure no significant discolouration of receiving waters. If required the outlet valve should be shut and remedial actions identified and implemented.
- Regularly clean out solids that accumulate in the pond and remove to an appropriate off-site disposal facility.

The following is a description of the measures to be undertaken to minimise the potential environmental adverse effects in the unlikely event of a fire emergency at the Battery Energy Storage System (BESS) facility:

Emergency storage of fire water runoff from the BESS will be provided to prevent contaminated fire water from entering the environment. The BESS platform will be an impervious (paved) surface and contoured such that if a fire were to occur, the contaminated runoff (generated during a firefighting operation) will be directed to a stormwater collection manhole located at the corner of the platform. The manhole will feature a submerged outlet with pipe connection to a downstream high-density polyethylene lined detention basin - sized to store the fire water volume of 288m^3. The outlet from the basin will have a readily accessible isolation valve which will be manually shut off in the event of a fire to prevent the contaminated water from discharging to the environment. The stored contaminated water will then be removed from site in a timely manner.

2.7.3 Rehabilitation Phase

Rehabilitation phase management procedures are to be undertaken upon completion of the construction of the MWF2. The management procedures are:

A. Decommission and remove from the area all hazardous substance facilities that are not permanent features of the facility, once they are no longer required. Ensure that any contamination of the surrounding area is remediated in accordance with best practice.

2.8 Stormwater

To minimise the adverse effects on existing stormwater runoff patterns and water quality within the receiving surface water bodies, the following stormwater infrastructure controls and monitoring measures are to be constructed and maintained throughout the construction and operations phases of the MWF2:

2.8.1 Establishment Phase

The control measures for on-going management of the stormwater runoff patterns from the MWF2 site will be designed prior to construction commencing, as part of the detailed design phase of the project.

The wind farm tracks and hardstands will intercept surface water runoff and thus have the potential to effect existing drainage patterns within the Wind Farm Site. Riley have undertaken a site wide catchment assessment to determine the location and design of proposed stormwater culverts which will minimise the impacts on existing drainage patterns. The primary purpose of the stormwater culverts is to keep pavements free from surface water (culverts to be adequately sized to pass the design rainfall event) and ensure that the water level range and hydrological function of wetlands is maintained.

The finalised Stormwater drawings and supporting design calculations shall be approved by the relevant Council(s) (in accordance with conditions of consent) prior to construction commencing.

Key design principles employed in the design of the access tracks and hardstands and stormwater infrastructure are:

(a) Tracks and hardstands will be located along ridgelines where practicable to avoid impact on natural flow paths.

(b) Conserve the natural flow paths to natural streams and wetlands downstream. This will be achieved through the use of stormwater culverts where tracks and hardstands intercept the flow paths to maintain the existing catchments and hydrology.

(c) Where practicable, stormwater is allowed to sheet flow from access tracks across the natural topography – thus reducing the number of culverts. Transmission line access tracks are designed to enable runoff to head up/sheet flow across the pavement to avoid the need for culvert - noting the temporary nature of those tracks.

(d) Where stormwater is collected, mitigation of potential erosion along drains and at outlets is managed through energy dissipation achieved through rock lined channels (table drains) along moderate to steep gradients (>5%) and rock aprons at culvert and drain outlets.

(e) Protection of proposed infrastructure from erosion or overtopping with adequately sized culverts to convey flow beneath fill embankments.

To meet these design principles during construction, works will be staged in a manner such that the stormwater culverts are installed concurrently with the formation of tracks and hardstands. This will ensure that the earthworks do not create temporary obstructions to the existing topography's natural flow paths.

Temporary culverts may also be utilised to maintain existing flow paths during earthworks construction. These will be detailed in the EMP.

The permanent stormwater culverts are broken down into four main types:

1. Type A culverts – to be located within natural flow paths/ephemeral streams (where there is no fish habitat) beneath access track fill embankments
2. Type B and C culverts – to be located at various locations along the access track and WTG hardstand table drains, to convey flow beneath the tracks and hardstands where they cross natural flow paths. Positions are determined relative to the location of downstream watercourse/wetlands, i.e. to maintain surface flow to those water bodies. Type B culvert outlets terminate on earthwork fill embankment and thus incorporate a rock lined flume section to direct flows to a riprap apron at the toe of the embankment. Type C culvert outlets terminate directly to the embankment toe (with a riprap apron).
3. Type D culverts – to be located at locations along access track and turbine platforms, to connect flow from one U/V ditch drain to another, conveying flow beneath tracks and hardstands where they cross natural flow paths or where a sag point is located along the road alignment.
4. Stream Culverts – to be located within intermittent or perennial streams which will be crossed by a track fill embankment, requiring a culvert size >=1,200mm dia. (a trigger for consent under SWLP Rule 59b). These include the replacement of existing culverts and fords at existing farm/forestry track crossings. Fish passage to be provided except where fish passage has been identified as being detrimental to upstream habitats – in which case specific fish barrier measures have been designed.

2.8.2 Activity Phase

Activity phase management procedures, which are to take place throughout any construction activity, are as follows:

General Stormwater

A. Install (as early as practicable) the planned erosion and sediment control measures – in accordance with the EMP.
B. Inspection, during and following rainfall events, of the control measures and surrounding vicinity in order to confirm that the measures are achieving their purpose.

C. The permanent stormwater culverts and energy dissipation structures (detailed on the approved stormwater drawings) shall be constructed as part of earthwork construction to maintain flow to downstream water bodies. Appropriate sediment control measures shall be employed at culverts to prevent the transportation of sediment laden water downstream – in accordance with the EMP.

D. Temporary culverts will be required in addition to the permanent stormwater culverts, at any location where earthwork activities may disrupt flow paths to wetlands and a permanent culvert is not proposed – such as the transmission line temporary tracks. The EMP will set out the specific sediment control measures to be employed for each culvert/site.

E. Undertake monitoring, at regular intervals during construction to confirm that receiving water standards are being met, in accordance with the procedures outlined in the EMP.

F. If it is evident that the water quality standards are not being met, immediately undertake any necessary maintenance and/or other appropriate measure to ensure the ongoing and future effectiveness of water quality controls.

Stream Crossings

Key measures for minimising the potential environmental effects of working in or near watercourses include installing temporary diversion measures and ensuring machinery is not stored in or near watercourses.

The envisaged construction methodology/sequence for the stream culvert works is outlined below. The alignment of the proposed stream culvert is offline from the existing stream, thus the temporary stream diversion works during culvert installation will be relatively straight forward and low impact. The expected duration of Phase 1 works (works within the stream) is approximately two weeks.

Phase 1:

1. As far as is practical undertake works during dry/low flow periods where no significant rain is forecasted.
2. Construct diversion bunds to divert cleanwater runoff away from the working area.
3. Construct non-erodible dams (using sand-bags or similar) at the upstream and downstream end of the culvert. Form temporary/isolated stream diversions to direct stream flow around bunded areas. Downstream dam to feature a T-bar decant to drain the works area if required to keep the area dry from groundwater/water leakage.
4. Offline from stream - install precast culverts and wingwalls, pour in-situ concrete baffles and aprons, place culvert infill material and form low flow channel as per design.
5. Place and compact backfill material around the culvert to half height (minimum).
6. Remove diversion bunds, and upstream and downstream dams - allowing flows to pass through the new culvert.

Phase 2:

1. Install silt fences around the base of the fill embankment.
2. Continue with backfill over the culvert and forming of the fill embankment.
3. Form sediment control measures for approach tracks (e.g. drop out pits) and commence earthworks to form the tracks.
4. Existing farm track crossing and culvert to be removed and area remediated (undertake works during low-flow dry period).
5. Stabilise the earthworks area and remove sediment controls.

The Lee Stream Tributary Water Quality Monitoring Plan (prepared by SLR Consulting) includes sampling to be undertaken relating to works within the stream:

> '*Sampling during works activities will be undertaken at a time when activities have progressed to the extent that sediment control measures would be required (i.e., sampling is to demonstrate whether control measures were working effectively).*'

And;

> '*Once works have been completed, sampling will be undertaken following removal of all equipment and control measures from the watercourse, and stabilisation of areas of bare earth.*'

The Fish Recovery Plan (prepared by SLR Consulting), notes '*there will be localised stream channel dewatering associated with the culvert installation, which triggers the requirement for salvage to avoid adverse effects on the resident fish*'

Reference shall be made to the Water Quality Management Plan and Fish Recovery Plan for further details on specific management procedures to be followed during works within the Lee Stream Tributary.

2.8.3 Rehabilitation Phase

Rehabilitation phase management procedures are to be undertaken upon the completion of installation of every stormwater control measure. The management procedures are:

A. Until all construction works have been completed and ground stabilised and sediment control measures removed, the stormwater control measures shall be monitored to ensure appropriate performance and/or to identify any signs of erosion. If it is evident that the control measures are not working appropriately, immediately undertake any necessary maintenance and/or other appropriate measure in order to ensure the ongoing and future effectiveness of the control measure.

B. Refer Section 4.8 of this management plan for procedures to be followed for the stormwater commissioning phase.

3.0 Contingencies

There is potential for unforeseen events to occur that can have adverse effects on the environment, resulting in urgent action being required. With respect to the ECMP, the following events have been identified as having potential to cause adverse effects during construction of the MWF2:

- Natural hazard events such as floods or seismic events.
- Extreme rainfall events.
- Operational errors.
- Failure of equipment.
- Vandalism.

Potential outcomes of these events include:

- Discharge of sediment laden stormwater, fuels, lubricants, cement, or hazardous materials to surface waters.
- Air discharges.
- Excessive noise discharge.

3.1 Discharges of Hazardous Materials

The nature of the risk posed from discharges of hazardous materials and substances will vary dependant on the magnitude of the discharge and also the location relative to more sensitive receiving environments. Section 2.7 identifies the procedures to be taken to minimise the potential for discharge of hazardous materials. In the event of a spill, the following procedure shall be followed (to the extent applicable):

- Take immediate corrective measures to halt the spill if appropriate/safe to do so.
- Determine the type and volume of material being spilled and evaluate the nature of the risk posed.
- Should spillage occur or container rupture, the Contractor will ensure that all spilled material and/or any contamination is contained, pumped and/or removed into suitable holding containers. All this material shall be removed from the site as soon as practicable and disposed of at an approved facility. Spilled material is not to be placed in the receptacles being utilised for solid waste. An incident report is to be prepared if any such event occurs. Refer section 3.1 of this report for further details.
- Report spillage to Environment Officer or person in charge who will then:
    - arrange to stop all operations in the immediate area and shut off any ignition sources;
    - with the appropriate protective clothing shall isolate the source of the spillage by closing off valves, sealing leaks, etc.
    - contain the spill by using a spill kit and/or forming a perimeter bund;
    - call ORC/CDC;

- inform TWP;
- Pump and/or remove spills into suitable holding containers and remove all contaminated soil to an approved waste disposal facility and reinstate the affected area. Spilled material is not to be placed in the receptacles being utilised for solid waste ;
- replenish the spill kits if used;
- An incident report is to be prepared if any such event occurs. Review contingency plans and procedures in terms of their effectiveness in managing the spill; and
- amend site operational procedures, as necessary.

3.2 Air Discharges

In the event of an unacceptable level of contaminants or pollutants being discharged into the air beyond the project site, the first action will be to stop the discharge by shutting off the cause of the contaminant.

Once the discharge has ceased, actions will be taken to avoid, mitigate or eliminate the risk of re-occurrence. This may involve repairing/replacing the vehicle/or machinery which is generating the discharge.

3.3 Review

Immediately following any event requiring contingency actions to be carried out, the Environment Officer shall establish the causes of the event and review the effectiveness of the response. Based upon the outcome of the review, the ECMP may be updated.

4.0 Records, Reporting, and Inspections

The consent holder shall keep records and respond to incidents and public enquiries/complaints and report to the relevant District or Regional Council in accordance with consent conditions.

4.1 Incidents

An incident register will be maintained to record any incidents on-site that may be considered to have potential for adverse environmental effects and cause a non-compliance with the consent conditions. Such incidents shall be reported to the relevant District or Regional Council in accordance with the consent conditions. Such incidents may include:

- discharges from un-stabilised areas not serviced by erosion and sediment controls measures;
- failure of erosion and sediment control measures;
- any material unforeseen adverse effect to the environment due to concrete batching plant activities;
- any spill of fuel or hazardous substances; and

- any other incident which either directly or indirectly causes, or is likely to cause, adverse environmental effects not authorised by the resource consents for the MWF2.

The incident will be reported directly to the Environmental Officer, who shall determine if the scale of the incident warrants the notification of Council(s) or other agencies. If it does, the Environmental Officer will then:

- Liaise with the relevant Council(s), to establish what remediation or rehabilitation works are required to be implemented to prevent further similar incidents occurring.
- Carry out remedial actions as required to the satisfaction of Council(s).
- Maintain a permanent record of the details of the incident and the steps taken to remedy the adverse environmental effects. A copy of this record shall be provided to the Council(s) within an agreed timeframe. A complaints register shall be maintained for the duration of the works.

4.2 Public Feedback

All employees of the main contractor and sub-contractors shall be informed during their site inductions, to report any feedback from site visitors, neighbouring property owners, or the general public.

All public feedback received in respect of the construction works shall be officially recorded, this record is to be maintained by the Environmental Officer. In respect of a complaint, the Environmental Officer will be responsible for managing the implementation of remedial actions if applicable and follow up communications with the complainant.

The feedback record will detail, where possible:

- Name, address, and contact details of the person.
- Explanation of the inquiry/complaint.
- Date and time of the inquiry and event or action.
- Weather conditions at the time of the event.
- Outcome of any investigations into the event.
- In respect of a complaint, any measures taken to ensure that such an event does not occur again.
- Any follow up communications with the complainant.

4.3 Monitoring and Inspections

Inspections are required to ensure compliance with resource consent conditions and this ECMP. Weekly site inspection will be undertaken by the Environmental Officer with the aim to identify any issues and rectify them as soon as possible to maintain compliance and improve performance.

The inspections will include but are not limited to:

- Checking all earthworks and sediment control devices.
- Checking the stormwater system has been installed in accordance with the approved drawings.
- Checking culverts for debris and blockages, checking stormwater outlets and drains for signs or erosion.
- Checking the worksite for any spills.
- Ensuring earthworks are confined to designated areas.
- Exclusion areas (including buffers) are clearly identified and left undisturbed.
- Fuel and hazardous material storage.

Earthworks activities and associated controls will be checked on a daily basis during earthworks operations, or on a weekly basis during the stabilisation period (or following significant rainfall).

The Environmental Officer or Representative will ensure a weekly visual inspection of the concrete batching plant equipment and activities is carried out prior to weekly use. The inspection will be carried out by the concrete batching plant supervisor or other persons familiar with the plant's operation. Outcomes of the inspection shall be recorded for auditing purposes.

Depending on the duration of the project, audits by environmental and sustainability staff external to the project will be undertaken. Audits are a good way of identifying areas for improvement. Audit results must be communicated to staff and action items closed out in a timely manner.

The Project Manager is responsible for ensuring environmental monitoring and inspections are undertaken.

This ECMP will be reviewed throughout the project to ensure that any changes in the project scope, environmental effects and learnings from incidents have been adequately addressed.

4.4 Reports

The Environmental Officer will report to Council compliance personnel monthly on environmental management of the site and compliance with resource consent conditions and this ECMP.

4.5 Records

Example of records that will be maintained in the Site Offices:

- Daily/weekly inspections.
- Monthly Reports.
- Incident Reports.
- Public Feedback Records.
- Site Induction Register.
- Training records.

- A record of all bulk deliveries to and dispatches from the concrete batching plant.
- A record of bulk fuel deliveries to fuel storage facilities on-site.
- Hazardous Materials Register.
- Material Safety Data Sheets.
- Maintenance records and inspections of the concrete batching plant.

4.6 Documentation

The following documentation will be kept in the site offices as reference material:

- The final 'overall' ECMP including appended separate Management Plans.
- Copies of resource consents, water permits, and any other relevant Council Consents.

4.7 Stakeholder Liaison

It is important that stakeholders are kept informed of project progress where this may affect them. Typical issues which may affect the community include:

- Night works
- Works on or close to property boundaries
- Works affecting property access
- Works with a human nuisance factor such as noise or vibration, and
- Services interruptions.

Methods of communication may include letters, mailbox drops, newspaper advertising and website or email updates.

The consent holder is responsible for establishing a community consultation group who shall meet at least six-monthly during construction. The objective of the group will be to facilitate information flow between the consent holder's management team and the community and will be an ongoing point of contact between the consent holder and the community. The functions of the group shall also include acting as a forum for relaying community concerns about the construction of the project.

4.8 Stormwater Systems Commissioning and Monitoring

Following the installation of the stormwater systems (open drains, culverts, headwalls, manholes, basin, rip rap outlets, etc), as-built plans shall be prepared detailing the size/alignment/location/and specification of the stormwater system. The as-built plans shall be checked and certified by the project engineer of surveyor as being an accurate record of the constructed systems, and as confirmation that they have been constructed in accordance with the approved design drawings. Copies of the as-built plans shall be provided to ORC on request.

Monitoring of the wind farm stormwater systems shall be undertaken during the initial operation phase, to confirm the systems are operating correctly and effectively.

Once the respective earthwork catchments have been fully stabilised and ESC measures removed, the following monitoring of the stormwater systems shall be arranged:

- On commissioning – inspect the condition of the stormwater systems, e.g. - culverts correct size and free from debris, rock riprap correct grade and coverage, low flow channel within stream culvert complete and operating correctly, detention basin liner complete and certified by installer, etc. Undertake quarterly and post-storm inspections (where > 20mm rainfall accumulates over 24hr period) – inspect the condition of the stormwater system, check for any signs of erosion within channels or downstream of outlets. Undertake remedial/maintenance measures as required, such as placement of additional rock protection if signs of significant erosion, removing debris from culverts, etc.
- After one year of operation, formal monitoring of the stormwater system can cease provided inspection records show the system is operating effectively. However, it is expected that ad-hoc monitoring and maintenance of the stormwater system will continue as part of the general wind farm operation. Ongoing monitoring wetlands shall be covered under the Wetland Monitoring and Management Plan.

Details of the inspections and any follow up actions taken shall be recorded and made available to ORC on request.

5.0 Training and Awareness

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

Training of site staff will be provided through project inductions, toolbox meetings, 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 and waste reduction/recycling training. Environmental and sustainability issues will form a regular part of toolbox meetings to ensure all workers are aware of the key issues. Opportunities will also be made available for selected staff members to attend industry training programmes where they would benefit from further training.

6.0 Corrective and Preventative 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 Project Manager, however this will be appropriately delegated to the Project Team.

Corrective and preventative actions will also be developed following the identification of root causes during an incident investigation. Once the corrective and preventative actions have been successfully implemented, future incidents of a similar nature should be prevented from reoccurring.

7.0 Limitation

This report has been prepared for Tararua Wind Power, to inform the Expert Consenting Panel's consideration of Contact's application for approvals under the Fast-track Approvals Act 2024 and any subsequent regulatory processes.

The reliance by other parties on the information or opinions contained in the report shall, without our prior review and agreement in writing, be at such parties' sole risk.

PART C Appendices – Separate Management Plans

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