

RESOURCE CONSENT CONDITIONS

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DEFINITIONS

The table below defines the acronyms and terms used in the conditions. Defined terms are capitalised throughout the conditions.

Acronym / Term	Definition / Meaning		
Acute Event Threshold	Catchment	Acute storm event (events equal to or greater than)	Acute Event Threshold (tonnes/acute event)
	Hoteo Inlet	24 hour 10-year ARI event	512
	Mahurangi Harbour	24 hour 30-year ARI event	600
Acute Event Sediment	Total sediment (tonnes) discharged from Project Works over the total Project construction period (excluding total sediment generated by a greater than or equal to 100-year ARI event) above the Acute Event Threshold(s)		
AMP	Adaptive Monitoring Plan		
ARI	Average Return Interval		
AUP(OP)	Auckland Unitary Plan Operative in Part		
Bed	As defined in the RMA		
CAQMP	Construction Air Quality Management Plan		
CEMP	Construction Environmental Management Plan		
CESCP	Construction Erosion and Sediment Control Plan		
CIR	Cultural Indicators Report		
CMA	Coastal Marine Area		
Construction Works	Activities undertaken to construct the Project excluding Enabling Works		
CTMP	Construction Traffic Management Plan		
Cumulative Sediment	Total sediment (tonnes) discharged from Project Works above the Cumulative Threshold(s) over the total Project construction period minus any Acute Event Sediment		

Acronym / Term	Definition / Meaning	
Cumulative Threshold	Catchment	Cumulative threshold (tonnes)
	Hoteo Inlet	9000 [x total years of Construction Works]
	Mahurangi Harbour	4300 [x total years of Construction Works]
	Oruawharo Inlet	3300 [x total years of Construction Works]
Day(s)	Has the same meaning as “working day” under section 2 of the RMA	
DEB	Decanting earth bund	
Designation	The designation for the Project included in the AUP(OP)	
Enabling Works	Preliminary construction activities as follows: <ul style="list-style-type: none"> • geotechnical investigations (including trial embankments); • formation of access for geotechnical investigations; • establishment of site yards, site offices, site entrances and fencing; • constructing and sealing site access roads; • demolition or removal of buildings and structures; • relocation of services; and • establishment of mitigation measures (such as erosion and sediment control measures, temporary noise walls, earth bunds and screen planting) 	
Erosion Prone Stream	Streams with soft beds (not rock) that are predicted to be subject to flow changes of >15% to peak 2-year and 10-year ARI flows compared to predevelopment	
ESCP	Erosion and Sediment Control Plan	
EWCEMP	Enabling Works Construction Environmental Management Plan	
EWCESCP	Enabling Works Construction Erosion Sediment Control Plan	
EWCMP	Enabling Works Cultural Monitoring Plan	
EWCTMP	Enabling Works Construction Traffic Management Plan	
GD01	Auckland Council Guideline Document 2017/001: Stormwater Management Devices in the Auckland Region (December 2017), or any subsequent version	
GD05	Auckland Council Guideline Document 2016/005: Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (June 2016), or any subsequent version	

Acronym / Term	Definition / Meaning
Highly Sensitive Receiver (HSR)	Residential dwellings within: <ul style="list-style-type: none"> • 200m of the Designation boundary; • 50m of sealed access roads used for Project Works up to 500 m outside of the Designation boundary; and • 100m of unsealed access roads used for Project Works outside of the Designation boundary.
Incident	A release of contaminants (including sediment) or materials into a waterbody that exceeds typical background levels
Kourawhero Wetland Complex	The wetland complex associated with the Kourawhero Stream as identified on Map 17
Intermittent stream	As defined in the AUP(OP)
Manager	The Manager – Resource Consents, of Auckland Council, or authorised delegate
Mana Whenua	Māori with ancestral rights to resources in the Project area and responsibilities as kaitiaki over their tribal lands, waterways and other taonga
Maximum Open Earthworks Area	Maximum area of earthworks allowed to be open (unstabilised) at any one time
Mitigation Sites	The Mitigation Sites identified on Maps 7 – 12
Permanent stream	As defined in the AUP(OP)
Project	The construction, maintenance and operation of the Ara Tūhono Warkworth to Wellsford Project, which extends from Warkworth to north of Te Hana
Project Liaison Person	The person or persons appointed for the duration of the construction phase of the Project to be the main and readily accessible point of contact for persons affected by the construction work
Project Works	All activities undertaken to construct the Project (both Construction Works and Enabling Works) and including ecological and landscape mitigation activities) but excluding operation of the highway
Representative Watercourses	The watercourses set out in Maps 1-6.

Acronym / Term	Definition / Meaning
RMA	Resource Management Act 1991
SCMP	Stakeholder and Communications Management Plan
SECP	Streamworks Ecological Compensation Plan
Sediment Reduction Activity	Works or activities that reduce sediment discharging into the CMA. Such works or activities may include any Project Works, land retirement (e.g. retirement of commercial plantation forest and/or pasture), planting or other sediment reduction works or activities.
Sediment Reduction Factors	Tonnes of sediment per hectare discharging into the CMA that will be reduced by a Sediment Reduction Activity.
SH1	State Highway 1
SOMP	Stormwater Operations and Maintenance Plan
SRP	Sediment Retention Pond
SSTMP	Site Specific Traffic Management Plan
Stabilisation	The activity to achieve a Stabilised Area
Stabilised, Stabilised Area	<p>Refers to an area inherently resistant to erosion such as rock or an area that has been stabilised after earthworks and is excluded from the definition of Maximum Open Earthworks Area.</p> <p>Stabilisation methods may include use of mulch and/or other woody organic matter, geotextile, the use of hard fill material and exposing rock as set out in GD05 or as approved through conditions.</p> <p>Where vegetation is used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once an 80% vegetation cover has been established.</p>
Stage(s)	A specific works area or new land disturbing activity associated with construction of the Project as nominated by the Consent Holder.
Stormwater Management Wetland	A permanent stormwater management device in the form of a constructed wetland designed to manage stormwater runoff volume, flow and/or contaminant loads prior to discharge
Suitably Qualified and Experienced Person	A person (or persons) who can provide sufficient evidence to demonstrate their suitability and competence

Acronym / Term	Definition / Meaning
Trigger Event	An event in which the following occurs: <ul style="list-style-type: none"> • Greater than 25mm of rainfall over any 24-hour period (as measured by the automatic onsite rainfall devices) where Project Works subject to a CЕСCP are not Stabilised • Greater than 15mm of rainfall within an hour period where Project Works subject to a CЕСCP are not Stabilised
TSS	Total Suspended Solids
Watercourse	Permanent and intermittent rivers and streams but not ephemeral streams or Wetlands.
Wetlands	Includes permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions, excluding Stormwater Management Wetlands.

Maps:

Maps 1 – 6	Representative Watercourses
Maps 7 – 12	Mitigation Sites
Map 13	Fauna Habitat and Flyway mitigation area
Map 14 – 16	Bridge Structures in Watercourses
Map 17	Crossing of the Kourawhero Stream and associated wetland complex
Maps 18 – 20	Ecological Sites

General

Consent Lapse and Expiry

- 1 Pursuant to sections 123 and 125(1) of the RMA (and where relevant in accordance with section 116 of the RMA), the lapse and expiry dates for the various resource consents are as set out in Table 1 unless they have been given effect to, surrendered or been cancelled at an earlier date.

Table 1: Resource consent lapse and expiry dates

Ref.	Resource consents	Lapse date	Expiry date
Land disturbance activities			
LUC60354952	Land use (s.9(2)) – earthworks	15 years	Unlimited duration
LUC60354952	Land use (s.9(2)) – vegetation alteration and removal.	15 years	Unlimited duration
LUC60354952	Land use (s.9(2)) – construction of stormwater detention/retention ponds	15 years	Unlimited duration
Works in watercourses and wetlands			
LUS60354955	Land use (s.13) - new structures in, on, under or over the bed of rivers, streams (including intermittent streams) and wetlands.	15 years	35 years from the date of commencement
LUS60354955	Water permit (s.14) - diversion and temporary damming of water	15 years	35 years from the date of commencement
WAT60354953	Water permit (s.14) - diversion of intermittent and permanent watercourses and associated disturbance and sediment discharge throughout the Project area during construction and operation.	15 years	35 years from the date of commencement
Diversion of groundwater			
WAT60355184	Water permit (s.14) - diversion of groundwater and dewatering construction and operation.	15 years	35 years from the date of commencement
Diversion and discharge of stormwater			
WAT60356979	Water permit (s.14) - diversion of stormwater associated with new permanent impervious surfaces.	15 years	35 years from the date of commencement

Ref.	Resource consents	Lapse date	Expiry date
DIS60354954	Discharge permit (s.15) - discharge of stormwater runoff from new permanent impervious surfaces into or onto land or water.	15 years	35 years from the date of commencement
LUC60355185	Land use (s.9(2)) – development of all new impervious surfaces for high use roads within the Project area.	15 years	Unlimited duration
Discharges to air			
DIS60355186	Discharge permit (s.15) – temporary discharges to air during construction	15 years	15 years from the date of commencement

Review

- 2 These conditions may be reviewed by the Manager under section 128 of the Act, by giving notice pursuant to section 129 of the Act, at any time within six months of the first, second, third, fourth, and fifth anniversaries of the date of commencement of the construction of the Project authorised by this consent:
 - a. To deal with any adverse effect on the environment that may arise from the exercise of the consent and which it is appropriate to deal with at a later stage; or
 - b. To review the adequacy of any monitoring.

Management plans

- 3 The Requiring Authority shall prepare, submit to Auckland Council, have certified and implement the resource consent management plans in accordance with Table 2 and the specific resource consent conditions which apply to each management plan.
- 4 The Consent Holder may prepare management plans in parts or in Stages to address specific activities or to reflect the staged implementation of the Project Works.
- 5 If no response is received from the Manager within the response time set out in Table 2, the management plan shall be deemed to be certified.
- 6 The Consent Holder shall not commence Project Works within the area to which a management plan applies until the required management plan(s) has been certified or is deemed to be certified.
- 7 The Consent Holder may seek to amend a management plan in accordance with the process prescribed for the plan in Table 2.

Table 2: Management Plan Table

Management Plan	Decision Pathway	When to submit	Response time from Manager	Duration for implementation
Construction Environmental	To Manager for Information	At least 20 days prior to start of Construction Works	N/A	Duration of Construction Works
Enabling Works Construction Environmental	To Manager for Information	At least 20 days prior to start of Enabling Works	N/A	Duration of Enabling Works
Erosion and Sediment Control	Certified by Manager	Prior to start of Construction Works	Within 20 Working Days	Duration of Construction Works
Chemical Treatment	Certified by Manager	Prior to start of Construction Works	Within 10 Working Days	Duration of Construction Works
Construction Erosion and Sediment Control	Certified by Manager	Prior to start of Construction Works for specific area and/or activity	Within 10 Working Days	Duration of specific works and/or activity
Enabling Works Construction Erosion and Sediment Control	Certified by Manager	Prior to start of Enabling Works	Within 20 Working Days	Duration of Enabling Works
Adaptive Monitoring	Certified by Manager	Prior to start of Construction Works	Within 10 Working Days	Duration of Construction Works
Sediment Reduction Factors methodology	Certified by Manager	Prior to start of Construction Works	Within 20 working days	N/A
Streamworks Ecological Compensation	Certified by Manager	Prior to Project becoming operational	Within 20 working days	N/A
Stormwater Operations and Maintenance	Provided to Manager for information	Prior to operation of stormwater treatment devices	N/A	Throughout operation of Project

Management Plan	Decision Pathway	When to submit	Response time from Manager	Duration for implementation
Construction Air Quality	To Manager for Certification	Prior to start of construction works	Within 20 working days	Duration of Construction Works

Mana Whenua

Cultural Indicators Report

- 8 At least 6 months prior to start of detailed design of the Project, the Consent Holder shall invite Mana Whenua to prepare a Cultural Indicators Report for the Project, or to nominate a person or organisation to prepare a Cultural Indicators Report on their behalf. The purpose of the Cultural Indicators Report is to assist with the protection and management of Ngā Taonga Tuku Iho (treasures handed down by our ancestors) during Construction Works.
- 9 The Cultural Indicators Report should:
- Identify cultural sites, landscapes and values that have the potential to be affected by Construction Works;
 - Set out the desired outcomes and recommended methods for management of potential effects on cultural values;
 - Identify cultural indicators of cultural stream health as relevant to the Construction Works;
 - Set out recommended methods to measure the effects on identified cultural indicators during Construction Works;
 - Identify opportunities for restoration and enhancement of Mauri and mahinga kai within the Project area; and
 - Identify cultural values that should be acknowledged in the development of the SECP, and the Cultural Monitoring Plan for the Construction Works.
- 10 The Consent Holder shall discuss and have regard to the recommended methods set out in the Cultural Indicators Report with Mana Whenua and implement the methods where practicable to do so.
- 11 Conditions 9 and 10 will cease to apply if:
- Mana Whenua have been invited to prepare a Cultural Indicators Report at least 12 months prior to start of Construction Works; and
 - Mana Whenua have not provided a Cultural Indicators Report within six months prior to start of Construction Works.

Cultural Monitoring Plan (Construction)

- 12 At least 18 months prior to start of Construction Works, the Consent Holder shall prepare a Cultural Monitoring Plan. The plan shall be prepared by a Suitably Qualified and Experienced Person who is identified in collaboration with Mana Whenua. Collaboration shall be

completed within 30 Days of initiation by the Requiring Authority. The purpose of the cultural monitoring plan is to identify methods for undertaking cultural monitoring.

- 13 The Cultural Monitoring Plan shall include:
 - a. Requirements for formal dedication or cultural interpretation to be undertaken prior to start of Construction Works in areas identified as having significance to Mana Whenua;
 - b. Requirements and protocols for cultural inductions;
 - c. Identification of representative activities, sites and areas where cultural monitoring is required during particular Construction Works and the scope of cultural monitoring as appropriate to reflect the timing, location and scale of the Construction Works; and
 - d. Identification of personnel to undertake cultural monitoring, including any geographic definition of their responsibilities. The Cultural Monitoring Plan shall align with the requirements of other conditions of the resource consents and Designation for the Project which require monitoring during Construction Works.

- 14 If Enabling Works involving soil disturbance are undertaken, at least 6 months prior to the start of Enabling Works, the Consent Holder shall prepare an Enabling Works Cultural Monitoring Plan (EWCMP). The plan shall be prepared by a Suitably Qualified and Experienced Person who is identified in collaboration with Mana Whenua. Collaboration shall be completed within 30 Days of initiation by the Requiring Authority.

- 15 The Consent Holder shall prepare the EWCMP in general accordance with the Cultural Monitoring Plan Conditions 12 to 13 but with the scope modified as appropriate to reflect the timing, location and scale of the Enabling Works.

Construction Environmental Management Plan

- 16 The Consent Holder shall prepare a Construction Environmental Management Plan (CEMP) prior to commencement of Construction Works to set out management procedures and methods to be implemented to ensure ongoing compliance with these conditions and to address complaints and incidents in a timely manner during Construction Works.

- 17 The CEMP shall be prepared, having regard to the NZ Transport Agency Guideline for Preparing Environmental and Social Management Plans (April 2014), or any subsequent version including:
 - a. Roles and responsibilities of construction management staff, including the overall manager responsible for environmental management.
 - b. An outline construction programme, proposed staging, proposed hours of work and methods to inform Auckland Council of upcoming Construction Works, which shall occur at annual intervals or key construction times throughout the duration of Construction Works.
 - c. Contact details of the site supervisor or Project manager and the Project Liaison Person (telephone number and email or other contact address).
 - d. Methods and systems to inform and train all persons working on the site of potential environmental sensitivities and how to comply with these conditions.

- e. Measures to be adopted to maintain the land affected by Construction Works in a tidy condition in terms of disposal / storage of rubbish, storage and unloading of construction materials and similar activities.
 - f. The location of construction site infrastructure including site offices, site amenities, contractors' yard access, equipment unloading and storage areas, contractor car parking and security.
 - g. Means of providing for the health and safety of the general public.
 - h. Procedures for the refuelling and maintenance of plant and equipment to avoid discharges of fuels or lubricants to Watercourses.
 - i. Measures to address the storage of fuels, lubricants, hazardous and/or dangerous materials, along with contingency procedures to address emergency spill response(s) and clean up.
 - j. Procedures for responding to complaints about Construction Works;
 - k. Procedures for Incident management.
 - l. Methods for updating the CEMP as required.
- 18 The CEMP shall be prepared in consultation with Mana Whenua and the owner of the commercial plantation forest (Mahurangi Forest) located west of SH1, with respect to construction activities which directly interface with forestry operations. If the Consent Holder has not received any comment from the owner of the Mahurangi Forest within 20 Days of providing the CEMP to them, the Requiring Authority may consider the relevant party has no comments.

Enabling Works Construction Environmental Management Plan

- 19 Where Enabling Works are to be undertaken, the Consent Holder shall prepare a site or activity specific Enabling Works Construction Environmental Management Plan (EWCEMP) prior to commencing the relevant Enabling Works.
- 20 The EWCEMP shall be prepared in general accordance with Condition 17, with the scope modified to be commensurate with the scale and effects of the proposed works.

Erosion and Sediment Control

Erosion and Sediment Control (ESC) Outcomes

- 21 The Consent Holder shall design and construct the Project to achieve the following erosion and sediment control (ESC) Outcomes (*ESC Outcomes*):
- a. Prioritise minimisation of sediment generation by:
 - i. minimising the volume and area of the proposed earthworks required for the Project through earthworks design appropriate to slope and expected soil types and geology;
 - ii. maximising the effectiveness of ESC measures associated with earthworks by minimising potential for sediment generation and sediment yield; and
 - iii. Minimisation of discharges of all construction water related contaminants.
 - b. Monitor sediment yields and assess and remedy effects on freshwater and marine environments at the prescribed thresholds in Conditions 34 to 42.

- 22 The Consent Holder shall develop, construct and maintain all ESC plans and devices to achieve the requirements of GD05, except where otherwise certified by the Manager or a specific standard is detailed in a condition of this consent, in which case the specific standard shall apply.

Erosion and Sediment Control Plan

- 23 The Consent Holder shall prepare an Erosion and Sediment Control Plan (ESCP) for the Construction Works for the entire Project prior to Construction Work identifying the construction water management measures to be used on the Project to meet the ESC Outcomes.

- 24 The ESCP shall be prepared by a Suitably Qualified and Experienced Person and shall include the following:

General

- a. Methods of achieving the ESC Outcomes;
- b. Identification of a suite of appropriate structural and non-structural erosion and sediment control measures to be installed prior to and during all Construction Works for representative parts of the Project, including earthworks, and works within watercourses;
- c. Identification of a process and methods to ensure that offsite (clean) water runoff is prevented from entering active work areas, including the use of clean water diversion (CWD) channels and/or bunds to divert runoff;
- d. Identification of a process, methods and measures to ensure that any sediment laden runoff will be captured and directed to an appropriate sediment control device, including the use of dirty water diversion (DWD) channels and/or bunds;
- e. The approach and procedures for ensuring advance warning of a rainfall event;
- f. The methodology for identifying and recording the occurrence of the following rainfall events:
 - i. >24 hour 10-year ARI event in the Hoteo Inlet; and
 - ii. >24 hour 30-year ARI event in the Mahurangi Harbour
- g. The procedures for decommissioning the erosion and sediment control measures;
- h. The procedures for determining staging and sequencing of earthworks to limit the length of time and extent of exposed/disturbed soil and the details of progressive Stabilisation of these earthwork areas;
- i. A procedure to establish and define minor changes to erosion and sediment control, which would not require further certification by the Manager prior to implementation; and
- j. Methods for amending and updating the ESCP as required.

Responsibilities

- k. Identification of:
 - i. Appropriately qualified and experienced staff to manage the erosion and sediment control devices, associated maintenance procedures and monitoring requirements;
 - ii. Staff directly responsible for supervising installation, maintenance and decommissioning of erosion and sediment control devices and the associated works;
 - iii. A chain of responsibility for both the Project and its stages, including the overall manager (with authority to stop works), for managing erosion and sediment control on site;

- iv. An erosion and sediment control management team (including representatives from the contractor, Council and the Consent Holder) to meet and review erosion and sediment control practices and procedures as required; and
- v. Training requirements for staff to assist with their understanding of the environmental effects that need to be managed and the requirements of the consent conditions, including specific training prior to the start of Construction Works in any Stage.

Incident management

- I. Identification of the process to ensure compliance with Condition 48 and 49.

Chemical Treatment Management

- 25 A Chemical Treatment Management Plan (ChemTMP) which shall include:
- a. Specific design details of the flocculation treatment system including:
 - i. a rainfall or flow activated flocculation shed for all sediment retention ponds (SRPs) utilised on site;
 - ii. all SRPs having a contributing catchment area greater than 2ha to have two flocculation sheds;
 - iii. a rainfall or flow activated flocculation shed for all decanting earth bunds (DEBs) utilised on site that have contributing catchments over 500m²; and
 - iv. a rainfall activated flocculation system (such as flocculation socks) for all other decanting earth bunds and any other sediment detention or flow device system as may be employed on site;
 - b. Monitoring, maintenance (including post storm) and a contingency programme (including a record sheet) for the flocculation treatment system;
 - c. Results of any initial treatment trials and details of optimum dosage (including assumptions);
 - d. Consideration of the use of organic flocculants where practicable, provided that the most effective flocculent in terms of sediment removal shall be selected based on the results of any initial treatment trials;
 - e. A spill contingency plan;
 - f. Details of the person or bodies that will hold responsibility for the operation and maintenance of the chemical treatment system and the organisational structure which will support this system; and
 - g. Details for the checking and calibration of dosing and monitoring equipment.

Erosion and sediment control standards

- 26 The Consent Holder shall design and construct all erosion and sediment control measures and devices to achieve compliance with Conditions 22 and 24 and with the following design requirements:
- a. All sediment retention ponds and decanting earth bunds shall be designed, constructed and maintained at a volume equivalent to 3% of the catchment area (i.e. 300m³ per 1ha of contributing catchment);
 - b. Silt fence design shall be in accordance with TP90 and NZ Transport Agency Erosion and Sediment Control Guidelines for State Highway Infrastructure (Sept 2014), or any subsequent version, with a return upslope to provide robustness of the device;

- c. Clean and dirty water diversion channels, shall be sized to accommodate the flow from a 100 year ARI storm event where practicable;
- d. Sufficient and safe access to enable monitoring and maintenance (including forebay clean out) shall be provided at all times to all sediment retention ponds and decanting earth bunds.

Construction Erosion and Sediment Control Plans for Stages

- 27 The Consent Holder shall prepare CESCPS for each Stage of the Project, or a specific activity to set out how the requirements of the certified ESCP and the ESC standards in Condition 26 will be met for that Stage or activity.
- 28 The CESCPS shall be prepared by a Suitably Qualified and Experienced Person and shall:
- a. Methods of achieving the ESC Outcomes;
 - b. Identify how the requirements of the certified ESCP and the standards in Condition 27 will be met (where applicable); and
 - c. Include a schedule of current and planned open earthworks areas as applicable to that CESCPC catchment location at the time of preparation of that CESCPC.
 - d. Identify alternative Stabilisation measures based on project specific field trials to demonstrate its effectiveness in Stabilisation. The Project specific trials and results must be submitted to the Manager in that CESCPC.
 - e. Confirm catchment boundaries.
 - f. Confirm the location of the Construction Works, and the boundary and extent of works for that specific CESCPC.
 - g. Provide design criteria, typical and site-specific details of ESC measures, including supporting calculations, contributing catchment area, retention volume of structure, dimensions of structure and design drawings of erosion and sediment controls.
 - h. Provide identification of risk and sensitive area locations and the details of management (including contingency measures) around these aspects.
 - i. Confirm chemical treatment design and details consistent with the ChemTMP certified under the ESCP.
 - j. Provide a programme for managing ongoing non-Stabilised areas.
 - k. Provide design details for managing the treatment, disposal and/or discharge of contaminants (e.g. concrete wash water).
 - l. Provide an estimated sediment yield for the Stage of work.
 - m. Provide details of construction methods to be employed, including timing and duration. This shall include:
 - i. Streamworks methodologies;
 - ii. Programme for managing exposed area, including progressive Stabilisation considerations;
 - iii. Identification of areas susceptible to erosion and sediment generation or high-risk areas including specific measures for managing this risk;
 - iv. Identification of contingency measure; and
 - v. Access and maintenance provisions.
 - n. Include plans showing contour information at suitable intervals, cut and fill operations, erosion and sediment controls, stream diversions, discharge points to Watercourses.
 - o. Provide procedures for decommissioning of ESC measures.

- p. Contact details of the site supervisor or Project manager and the Project Liaison Person (telephone number and email or other contact address).

CESCP As-built certification

- 29 Prior to Construction Works in the Stage that the CESCP applies commencing (excluding the construction of the erosion and sediment controls themselves) as-built plans signed by a Suitably Qualified and Experienced Person shall be submitted to the Manager for information as confirmation that the erosion and sediment control measures for that CESCP have been constructed in accordance with the certified CESCP.

Enabling Works

- 30 The Consent Holder shall prepare specific CESCPs for the Enabling Works for the Project. The CESCPs shall be prepared by a Suitably Qualified and Experienced Person and shall address the requirements of a CESCP under Conditions 27 and 28 but with the scope modified as appropriate to reflect the timing, location and scale of the Enabling Works.

Adaptive Monitoring Programme

- 31 Prior to Construction Works commencing, the Consent Holder shall have a certified Adaptive Monitoring Plan (AMP) to:
- a. ensure the ESC Outcomes are met;
 - b. enable accurate calculation of Acute Event Sediment and Cumulative Sediment Net Sediment; and
 - c. ensure continuous improvement as to the effectiveness of the erosion and sediment controls employed on site.
- 32 The AMP shall be prepared by a Suitably Qualified and Experienced Person and shall include methods for undertaking:
- a. Ongoing site visual assessments of all erosion and sediment devices;
 - b. Ongoing monitoring of devices and processes, including flocculation;
 - c. Identification of four representative SRPs;
 - d. Automatic onsite rainfall monitoring using at least 2 rain gauges, including automatic notification of a Trigger Event occurring;
 - e. Pre-Trigger Event inspections including outlining maintenance procedures and installing any additional measures required in response to the severity of the forecasted Trigger Event (including Stabilisation);
 - f. Trigger Event sampling, monitoring and response procedures in accordance with Conditions 34 and 36;
 - g. Outflow monitoring (measured in m³/sec) of the discharges of a representative number (at least four SRPs) with:
 - i. two SRPs to best represent a high-risk location of the earthworks on the Project (steeper locations or those with a catchment greater than 5ha); and
 - ii. two SRPs to represent the design and construction for general earthwork activities.
 - h. Automatic sediment sampling at the same selected SRPs to measure outflow TSS (or an alternative water quality parameter that can be related to suspended solids concentrations).

- i. An analysis of the monitoring detailed in conditions 32(g) (flow) and 32(h) (TSS) to allow for calculation of cumulative sediment to the Hoteo, Mahurangi and Oruawharo catchments and for calculating Acute Event Sediment during the following events:
 - i. 24 hour 10-year or greater ARI event in the Hoteo Inlet (with a sediment load of >512 tonnes); and
 - ii. 24 hours 30-year or greater ARI event in the Mahurangi Harbour (with a sediment load of >600 tonnes).
- 33 The Consent Holder shall keep a record of implemented adaptation methods and provide the record to the Manager on request.

Monitoring effects of a Trigger Event

- 34 During a Trigger Event, the Consent Holder shall take grab samples (unless it shall be unsafe or dangerous to do so) to measure TSS, or alternative water quality parameter that can be related to suspended solid concentrations, at discharge points of all SRPs and a selection of DEBs (a minimum of 50% of the operational DEBs) at the time of a discharge.
- 35 Within 12 hours of a Trigger Event occurring, or as soon as practicable, the Consent Holder shall investigate erosion and sediment control measures to determine whether there has been a discharge.
- 36 In the event of a discharge occurring as a result of a Trigger Event, the Consent Holder shall instruct a Suitably Qualified Person to take the following actions:
 - a. Inspect the earthworks site and erosion and sediment control devices to identify any problems or activities likely to have contributed to an increased sediment discharge;
 - b. Take a grab sample of each discharge from a sediment control device to determine TSS, or alternative water quality parameter that can be related to suspended solid concentrations, concentrations (unless it will be unsafe or dangerous to do so);
 - c. Record observations and take a manual grab sample that can be related to suspended solid concentrations, , or alternative water quality parameter that can be related to suspended solid concentrations, in the freshwater receiving environment, upstream and downstream of the most upstream and downstream discharges within the area of Project Works; and
 - d. Remedy any identified problems, and implement any further controls on activities or areas of the site that are likely to contribute to sediment discharge into the receiving environment; and
 - e. Notify the Manager of the Trigger Event occurring, and any actions undertaken.

Sediment reduction activities

- 37 Where there is Acute Event Sediment and/or Cumulative Sediment (greater than zero) (determined using the data collected from the representative SRPs as required by conditions 37 to 42), the Consent Holder shall:
 - a. for Acute Event Sediment, implement Sediment Reduction Activities to offset the effects of that sediment within 25 years of the date of the Acute Event that caused the Acute Event Sediment; and
 - b. For Cumulative Sediment, implement Sediment Reduction Activities to offset the effects of that sediment within 25 years of the Project becoming operational.

- 38 A Suitably Qualified and Experienced Person shall prepare a methodology identifying:
- a. Sediment Reduction Factors for any Sediment Reduction Activities; and
 - b. Any measures necessary for the Sediment Reduction Activities to achieve the predicted sediment reduction over a 25-year period.
- 39 The Sediment Reduction Factors shall be calculated by the Suitably Qualified and Experienced Person using:
- a. The methodology set out in Appendix 1; or
 - b. Other best practice methods for assessing sediment generation and identifying Sediment Reduction Factors.
- 40 The methodology for calculating Sediment Reduction Factors for any Sediment Reduction Activities and related measures to achieve the predicted sediment reduction over a 25-year period, shall be provided to the Manager for certification prior to commencement of Construction Works.
- 41 The following information shall be provided to the Manager within six months of the date of an Acute Event occurring to demonstrate how condition 37(a) will be met:
- a. A record of the Acute Event Sediment including any exceedance beyond the Acute Event Thresholds for each catchment.
 - b. Documentation outlining the location where Sediment Reduction Activities have been applied and how they will offset the Acute Event Sediment within 25 years of the relevant Acute Event.
- 42 The following information shall be provided to the Manager within six months of the Project becoming operational to demonstrate how condition 37(b) will be met:
- a. A record of the Cumulative Sediment, including any exceedance beyond the Cumulative Thresholds for each catchment.
 - b. Documentation outlining the location where Sediment Reduction Activities have been applied and how they will offset the Cumulative Sediment within 25 years of the Project becoming operational.

Advice note: For the avoidance of doubt, in the event that the Cumulative Sediment Threshold is less than the Acute Sediment for which Sediment Reduction Activities have been provided under condition 37, no further Sediment Reduction Activities will be required for the Project

Earthworks Season Restrictions

- 43 The Consent Holder shall not undertake earthworks activities between 30 April and 1 October (winter period) in any one year unless otherwise approved by the Manager.

Maximum Open Earthwork Area limits

- 44 Unless approved in accordance with condition 46, the Maximum Open Earthworks Area for Project Works within the Hoteo catchment at any one time is 75ha.

- 45 Unless approved in accordance with condition 46, the Maximum Open Earthworks Area for Project Works within the Oruawharo catchment at any one time is 25ha.
- 46 Any request to the Manager for approval to open an earthworks area that is greater than 75 ha within the Hoteo catchment and/or 25 ha within the Oruawharo catchment, shall include the following information:
- a. The proposed earthworks programme and ESC measures implemented;
 - b. A comparison showing the modelled sediment yields compared to the actual sediment yields generated to date;
 - c. A minimum of 12 months of monitoring data to support an increased earthworks area. This must include water quality results from at least four automated sampling devices that gathered data from a comparable catchment; and
 - d. Identification of areas for continuous improvement opportunities (e.g. modifications to current ESC practice) for future earthworks.

Operational effectiveness and efficiency

- 47 The Consent Holder shall maintain all ESC measures to ensure they continue to achieve their design function throughout the duration of land disturbance and earthworks activity, and until the relevant site is Stabilised.

Incident Management

- 48 The Consent Holder shall notify the Manager within one Day or as soon as practicable after identifying that any contaminants (including sediment) or materials that exceed typical background levels have been released in the undertaking of the Work and entered any water body due to any of the following incidents:
- a. discharges from non-stabilised areas that are not treated by erosion and sediment control measures as required under this consent; and/or
 - b. failure of any erosion and sediment control measures;
 - c. discharge of a hazardous substances, including cement, to a water body;
 - d. failure of any temporary stream diversion;
 - e. un-consented removal, loss or damage to vegetation or other habitats;
 - f. any other incident which either directly or indirectly causes, or is likely to cause, adverse ecological effects in any water body that is not authorised by a resource consent held by the Consent Holder; and
 - g. Any other incident which is likely to adversely affect the quality of the water used for public reticulated water purposes.
- This notification shall be either by telephone or email, or via an alternative method as agreed with the Manager.
- 49 If any of the incidents identified in condition 48 occur, the Consent Holder shall:
- a. re-establish control measures where these have failed or have not been implemented in accordance with the relevant management plan as soon as practicable;
 - b. liaise with the Manager to establish what remediation or rehabilitation is required and whether such remediation or rehabilitation is practical to implement;
 - c. carry out any remedial action as required by and to the satisfaction of the Manager; and

- d. maintain a permanent record of the incident at the site, which shall include the date and time of the incident, the nature, manner and cause of the release of the contaminants, weather conditions at the time of the incident and the steps taken to prevent any further incidents and to remedy any adverse effects.

This notification (if not in person) shall be either by telephone or email, or via an alternative method as agreed with the Team Leader.

Stabilisation and decommissioning

- 50 The Consent Holder shall Stabilise sites against erosion as soon as practicable, and in a progressive manner, as earthworks are completed over various areas of Project Works.
- 51 If an area is not subject to earthworks activity (including cut and fill batters) for a 14-day period, or time otherwise certified with the Manager within a CЕСCP, the area shall be Stabilised.

Completion or abandonment of works

- 52 Upon completion or abandonment of earthworks on the Project site, including end of earthworks season, the Consent Holder shall Stabilise all areas of bare earth shall be Stabilised against erosion to the satisfaction of the Manager.
- 53 The Consent Holder shall give notice to the Manager on completion of Construction Works for each specific area and/or activity and prior to any ESC measures being removed.

Works in a watercourses and wetlands and freshwater ecology

Crossing watercourses - Location of bridge structures

- 54 The Consent Holder shall design and construct the Project to include bridge structures with no piers in the Bed of the following Watercourses (as identified on Maps 14 – 16):
 - a. Mahurangi River (Left Branch);
 - b. Hōteo River;
 - c. Waitaraire Stream; and
 - d. Maeneene Stream.

Crossing of the Kourawhero Stream and Kourawhero Wetland Complex

- 55 The Consent Holder shall monitor over a 12-month period prior to starting Project Works, Kourawhero Wetland Complex (as identified in Map 17) to confirm pre-construction water table levels. The results of the monitoring shall be provided to the Manager for information.
- 56 The Consent Holder shall design and construct bridges, structures, culverts and embankments to cross the Kourawhero Stream to minimise change to the Kourawhero Wetland Complex and to maintain the pre-construction water table level as far as practicable, which shall include:
 - a. A bridge over the Kourawhero Stream with no piers in the Bed in the section of stream identified on Map 17 as “Section of Kourawhero Stream to be bridged”; and
 - b. Minimising intrusion of diversion channels into or through the Kourawhero Wetland Complex.

Watercourse design requirements

- 57 The Consent Holder shall design and construct all permanent Project Works in or over any Watercourse (for example, all permanent bridges, culverts and stream diversions) to allow for capacity for 100-year ARI flood event with minimal scour and erosion to road structures eg culverts, bridges and embankments.
- 58 The Consent Holder shall design and construct all stream diversions to have natural stream forms and riparian planting where the diverted streams are permanent and supporting fish habitats. The stream diversions shall be designed by Suitably Qualified and Experienced Persons.

Permanent culvert design

- 59 The Consent Holder shall design and construct permanent culverts to:
- a. Minimise the risks of non-performance of the culvert, such as blockage, taking into account the risk of a vegetation/soil/rock debris flow; and
 - b. Incorporate energy dissipation and erosion control to minimise the occurrence of bed scour and bank erosion in receiving environments.

Temporary culvert design

- 60 The Consent Holder shall design and construct temporary culverts in any watercourse (for example, all temporary bridges, culverts and stream diversions) to allow for the 100-year ARI event (by primary structure or overland flow paths) with minimal scour and erosion unless otherwise certified by the Manager.

Culvert design – fish passage and migrating fish

- 61 The Consent Holder shall provide fish passage in accordance with best practice in all temporary and permanent culverts and Stormwater Management Wetlands unless deemed unnecessary or impracticable by a Suitably Qualified and Experienced Person.
- 62 Where fish passage is deemed unnecessary or impracticable, appropriate data and rationale for the decision shall be provided for certification by the Manager.

Design certification – permanent structures in Watercourses and Wetlands

- 63 The Consent Holder shall provide drawings of the detailed design of permanent bridges, culverts, and stream diversions to be constructed in or over Watercourses and Wetlands, to the Manager for certification at least 30 Days prior to the start of construction of the relevant structures. The drawings shall be accompanied by a written report prepared by a Suitably Qualified and Experienced Expert setting out how the design requirements of conditions 54 and 56 to 61 have been met and the rationale for any departures from those requirements. If a response has not been received from the Manager within 20 Days following the submission of the design, the design shall be deemed to be certified. The Consent Holder shall construct the Project in general accordance with the certified design.

Erosion Prone Streams: Pre-construction monitoring

- 64 The Consent Holder shall instruct a Suitably Qualified and Experienced Person to undertake pre-construction monitoring to identify all Erosion Prone Streams within the Project area prior to the start of Construction Works.
- 65 The pre-construction monitoring of Erosion Prone Streams shall include an inspection of all Erosion Prone Streams to record all erosion areas (supported by photographs and/or video footage). The purpose of monitoring Erosion Prone Streams is to identify the pre-construction condition of the Erosion Prone Stream to be used as a baseline against which to measure construction effects and identify any post-construction remedial measures.
- 66 The Consent Holder shall provide the results of the pre-construction baseline surveys and monitoring to the Manager for information, prior to the start of Construction Works.

Erosion Prone Streams: Post-construction monitoring

- 67 The Consent Holder shall undertake monitoring of Erosion Prone Streams at six-month intervals for 24 months following completion of Construction Works. The monitoring shall consist of walkovers of Erosion Prone Streams and recording of erosion-prone areas, including photographs.
- 68 If monitoring identifies new erosion that a Suitably Qualified and Experienced Person deems to be attributable to the Project based on the pre-construction condition of the Erosion Prone Stream, rehabilitation and/or remedial action, such as stabilisation of the stream bank or bed, shall be implemented in accordance with the Suitably Qualified and Experienced Person's recommendations.

Diverting Watercourses

- 69 Prior to Project Works within a Watercourse, including the filling of the bed, the Consent Holder shall put in place a diversion or diversions around the area of Project Works for all flows with a primary capacity up to the 20-year ARI flood event, unless an alternative design is certified by the Manager.
- 70 During weather events in excess of the 20-year ARI flood event, up to the 100-year ARI flood event (i.e. flows are greater than the capacity of the existing diversion), the Consent Holder shall put in place a stabilised flow path to minimise the potential for scour or erosion and allow flows to pass safely around or through the area of Project Works with minimum nuisance, damage and sediment generation or discharge.

As-built certification

- 71 The Consent Holder shall provide as-Built Plans certified by a Chartered Engineer confirming that permanent structures in and over Watercourses have been constructed in accordance with the certified design under condition 63 to the Manager within 90 Days of completion of the Construction Works.

Freshwater ecology: Pre-construction monitoring

- 72 The Consent Holder shall survey the Representative Watercourses or other watercourse determined by condition 73 for one summer and one winter period prior to commencement

of Construction Works prior to Project Works commencing. The survey shall be undertaken and recorded by a Suitably Qualified and Experienced Person:

- a. in accordance with the requirements of Stream Ecological Valuation: Application to Intermittent Streams (Auckland Council Technical Report 2016/023) or Stream Ecological Valuation (SEV): a method for assessing the ecological functions of Auckland streams (Auckland Council Technical Report 2011/009), depending on the stream classification; and
- b. to confirm representative pre-construction environmental conditions in the Project area, represented by:
 - i. sediment quality (concentrations of copper, lead, zinc, TOC and HMW- PAHs in both total sediment and the <63µm fraction, plus grain size analysis of the total sediment sample), and sediment depth; and
 - ii. water quality, limited to TSS, pH, turbidity, nitrogen and phosphorous.

73 In the event that a Suitably Qualified and Experienced Person considers a Representative Watercourse is not representative of general stream characteristics within the Project area, the Consent Holder shall survey such other Watercourse recommended by a Suitably Qualified and Experienced Person using the same process in condition 76.

74 The Consent Holder shall provide to the Team Leader the results of the pre-construction freshwater monitoring within 60 working days of the final pre-construction monitoring being undertaken, including the rationale for where an alternative stream has been surveyed under condition 73.

Freshwater ecology: Recording of streams affected by the Project

- 75 The Consent Holder shall instruct a Suitably Qualified and Experienced Person to identify and record all Watercourses and Wetlands that will be affected by Project Works, prior to the start of Project Works, including:
- a. Location;
 - b. Length;
 - c. intermittent or permanent status; and
 - d. which of the Representative Watercourses surveyed under condition 72 and 73 the Watercourse or Wetland is most similar too.

Freshwater ecology: Replacement works for loss of stream ecological value and function

- 76 The Consent Holder shall mitigate for streamworks or loss of stream ecological value and function in accordance with the requirements of the following technical reports prior to completion of Project Works:
- a. Stream Ecological Valuation: application to intermittent streams (Auckland Council Technical Report 2016/023); and
 - b. Stream Ecological Valuation (SEV): a method for assessing the ecological functions of Auckland streams (Auckland Council Technical Report 2011/009).

77 The quantum of mitigation and its design and location shall be set out in a Streamworks Ecological Compensation Plan (SECP). The SECP shall:

- a. Confirm the Watercourses and Wetlands in condition 75 that have been directly affected by the Project;
- b. Outline the method to extrapolate the SEV calculations for the Representative Streams to apply to all Watercourses and Wetlands affected by Project works;
- c. Calculate the quantum and location of mitigation provided in accordance with SEV requirements as set out in condition 76; and
- d. Integrate the mitigation planting with the restoration planting and habitat rehabilitation required in the Ecological Management Plan required under Designation Condition 55 where practicable.

Native fish capture and release

- 78 The Requiring Authority shall engage a Suitably Qualified and Experienced Person to conduct native fish habitat and presence surveys within the Designation prior to the start of Project Works in streams that may be impacted by Project Works.
- 79 In the event that the surveys confirm native fish habitat and presence the Requiring Authoring shall;
- a. Instruct a Suitably Qualified and Experienced Person to confirm and implement best practice methods to:
 - i. manage streamworks during September to November inclusive of any year, to minimise impacts on fish during the fish spawning season; and
 - ii. capture and relocate native fish species prior to commencement of Project Works.
 - b. Provide a report on the surveys undertaken and the results to the Manager.

Stormwater Discharge

- 80 The Consent Holder shall ensure that:
- a. All stormwater from the Project is captured, treated and discharged through offline Stormwater Management Wetlands to the extent practicable; and
 - b. All stormwater management devices and controls are designed to:
 - i. Include adaptation for 100-years of climate change;
 - ii. Provide treatment in accordance with GD01;
 - iii. Remove gross litter and floatables such as oil and volatile hydrocarbons;
 - iv. Provide detention for the 95th percentile 24 hour rainfall event in accordance with GD01;
 - v. Provide for the conveyance of 100 year ARI event, including provision for overland flow up to and including this event; and
 - vi. Minimise changes to the water flow into the Kourawhero Wetland Complex and to maintain the pre-construction water table level to the extent practicable if located upstream of the Kourawhero Wetland Complex.
- 81 The Consent Holder shall ensure that stormwater outfalls are designed to include erosion control to minimise the occurrence of bed scour and bank erosion at the point of discharge in accordance with TR2013/018 and GD01.

- 82 The Consent Holder shall ensure that cut off drains are designed to:
- a. Incorporate grassed or rock lining to prevent erosion;
 - b. Provide for the 100-year ARI rainfall event for the upstream catchment and discharge to existing streams or new culverts or where not reasonably practicable discharge to the road edge conveyance system; and
 - c. Minimise bed scour and bank erosion at the point of discharge.
- 83 The Consent Holder shall ensure that sediment traps (or similar alternative devices) are designed to minimise sediment eroded off rock cuts entered stormwater systems.
- 84 The Consent Holder shall design Stormwater Management Wetlands to:
- a. Locate offline from existing Watercourses;
 - b. Locate outside of the 100-year ARI floodplain if practicable;
 - c. Include:
 - i. Forebays and submerged or baffled low flow outlets so that floatables and litter can be trapped at the main outlet;
 - ii. Planting in emergent, littoral, riparian zones except in some areas of deep zone that are to remain plant free; and
 - iii. Valves on low-level wetland outlets to enable valves to be closed in the event of a spill to contain spilt material in wetland.
 - d. Provide for climbing fish access to wetlands where appropriate, to be determined by a Suitably Qualified and Experienced Person.
- 85 The Consent Holder shall use pre-treatment measures where higher sediment loads are anticipated, such as sediment traps for sediment eroded off rock cuts.
- 86 The Consent Holder shall ensure that the Project stormwater system is designed so that water can be collected from tunnels following tunnel washdown, accidental spill, or firefighting activities, and disposed of to a facility consented to receive contaminated water.
- 87 The Consent Holder shall ensure that stormwater management devices associated with local roads altered by the Project convey water runoff via vegetated and/or rock lined swales adjacent to the road prior to discharge to existing streams.
- 88 The Consent Holder shall maintain stormwater treatment devices to ensure that the criteria in Conditions 80 to 87 of this Consent are achieved.

Planting of stormwater management devices

- 89 The Consent Holder shall prepare planting plan(s) for all planted stormwater management devices (including treatment/conveyance swales). The planting plans shall be prepared by a Suitably Qualified and Experienced Person and shall include:
- a. Location, planting methodology and maintenance details;
 - b. Details of plant species, plant numbers, density and distribution; and

- c. Details of proposed pest plant management.
- d. Details of steps taken to integrate planting with other planting required for the Project where practicable.

Design certification – stormwater management devices

- 90 The Consent Holder shall submit the final detailed design of the stormwater management devices (ie excluding conveyance measures) to the Manager for certification at least 20 days prior to the start of construction of the proposed stormwater management devices. The final detailed design shall include:
- a. drawings;
 - b. specification design report(s); and
 - c. calculations and planting plans for the stormwater management devices.
- 91 If a response has not been received from the Manager within 20 Days following the provision of the final detailed design, the design shall be deemed certified and construction can commence.
- 92 The Consent Holder shall carry out all permanent stormwater measures in general accordance with designs certified in Condition 90.
- 93 Stormwater management devices shall be fully operational prior to the discharge of water from any impervious area identified to discharge to each device.

As Built Plans – Stormwater management devices

- 94 The Consent Holder shall submit As-Built Plans for stormwater management devices to the Manager at least 20 Days prior to use of the relevant device for its intended operational purpose.
- 95 The As-Built Plans shall be certified by a Suitably Qualified and Experienced Person and shall include:
- a. The surveyed locations and elevations of all stormwater devices which shall be measured to the nearest 0.02 metre with co-ordinates expressed in terms of the New Zealand Transverse Mercator Projection and DOSLI datum;
 - b. Stormwater management device details including locations, dimensions, volumes, flood levels, sections, treatment efficiencies, inlet, discharge rates and outlet structures;
 - c. Photographs at all stormwater systems outfall locations; and
 - d. Documentation of any differences between the certified design plans under Condition 90 and the As-Built Plans submitted under Condition 94.

Stormwater Operation and Maintenance Plan

- 96 The Consent Holder shall prepare a Stormwater Operation and Maintenance Plan (SOMP) prior to operation of the state highway to ensure the Project stormwater management devices are maintained to achieve their design function.
- 97 The SOMP shall be prepared by a Suitably Qualified and Experienced Person and shall:

- a. Identify a procedure for monitoring and maintaining the Project stormwater management devices; and
- b. Include the following:
 - i. Location map and access arrangements;
 - ii. Inspection and maintenance requirements and frequency;
 - iii. Routine and emergency contacts; and
 - iv. As-built drawings and stormwater system information.

98 In preparing the SOMP the Consent Holder shall consult with the owner of the commercial plantation forest (Mahurangi Forest) located west of SH1 with respect to permanent stormwater management activities which directly interface with forestry operations. If the Requiring Authority has not received any comment from the owner of the Mahurangi Forest within 20 Days of providing the SOMP to them, the Requiring Authority may consider the relevant party has no comments.

Flooding

99 The Consent Holder shall ensure that the design of the Project does not result in an increase in the 100 year ARI flooding levels greater than 100mm vertically outside the Designation. Compliance with this Condition shall be demonstrated by a hydraulic and hydrological model with the level of detail and reporting to be agreed with the Manager. The peak flood levels and flood flows for pre-development and post-development of the Project shall be compared upstream and downstream at the Designation boundary.

100 The Consent Holder shall demonstrate that any headwater ponding upstream of any Project culvert in the 100 year ARI event is contained within either:

- a. Land within the Designation at the time of construction; or
- b. An existing floodplain.

Air Quality

101 The Consent Holder shall avoid, as far as practicable, objectionable or offensive odour, dust and fumes arising from the operation of a rock crusher, beyond the boundary of the Designation impacting on HSRs.

102 The Consent Holder shall prepare a Construction Air Quality Management Plan (CAQMP) to outline the measures to be adopted to meet condition 101. The CAQMP shall be prepared by a Suitably Qualified and Experienced Person and shall include:

- a. A description of the works, and periods of time when emissions of odour, dust or fumes might arise from rock crusher;
- b. Identify the location(s) of any mobile rock crusher for the duration of construction
- c. Identification of HSRs that may be adversely affected by emissions of odour, dust or fumes from the rock crusher(s);
- d. Methods for mitigating dust that may arise from mineral extraction and rock crushing, potentially including minimum setbacks from HSRs where necessary, emissions control equipment (e.g. enclosure and/or water sprays at transfer points), and monitoring of weather conditions and visual inspections;

- e. Methods for undertaking and reporting on the results of daily inspections of Construction Works that might give rise to odour, dust or fumes;
- f. Methods for monitoring and reporting on the state of air quality during Construction Works, including wind speed, wind direction, air temperature and rainfall;
- g. Methods to remediate objectionable and/or offensive dust deposits from Construction Works on HSRs, potentially including cleaning exterior surfaces of houses or driveways and/or cleaning of water tanks and replenishment of water supplies.
- h. Procedures for maintaining contact with stakeholders and notifying of proposed construction activities, with reference to the SCMP, including complaints procedures;
- i. Construction operator training procedures; and
- j. Contact details of the site supervisor or Project manager and the Project Liaison Person (telephone number and email or other contact address).

103 When preparing the CAQMP the Suitably Qualified and Experienced Person shall have regard to the guidance contained in the Good Practice Guide for Assessing and Managing Dust, Ministry for Environment, 2016 and the NZ Transport Agency Guide to assessing air quality impacts from state highway projects (version 2.3, October 2019), or any subsequent version.

ATTACHMENT 1 - METHODOLOGY FOR CALCULATION OF SEDIMENT REDUCTION FACTORS AND THE EFFECTIVENESS OF SEDIMENT REDUCTION ACTIVITIES



Memorandum



Subject	Marine Mitigation Calculation Process	Project Name	Warkworth to Wellsford
Attention	Justine Bennett	Project No.	IZ083000
From	Kate Clay, Lydia Cetin		
Date	May 2019		

1. Introduction

This note outlines a process to calculate the necessity and size of additional mitigation areas of land to be retired and planted to offset the quantum of sediment discharged during the project.

The quantum of sediment discharged from the Project during construction should be offset in one generation, which is nominally 25 years following the end of the Project, through land retirement and planting strategies. The types of land retirement and planting available for sediment mitigation are:

- Planting and stabilisation of riparian margins of streams;
- Retirement of pasture areas and planting with shrubs and trees;
- of plantation forest areas, which may remain as exotic forest or be replanted as native forest Retirement, and cease being harvested.

The Project already includes Landscape and Ecology (L&E) mitigation planting, which has the additional benefit of erosion reduction. If the L&E mitigation planting does not offset the full quantum of sediment discharged during construction, then additional sediment mitigation planting will be required.

2. Sediment Reduction Factors

The sediment offset of the indicative L&E planting has been estimated through modelling. This has enabled quantification of the average annual offset of different retirement and planting types within the Project Designation. These sediment reduction factors have been calculated for mitigation planting in different areas and are set out in Table 1.

Table 1 Estimated sediment reduction factors (average offset) associated with retirement and planting mitigation options over 25 years

Mitigation type	Options	Sediment reduction over 25 years
Planting and stabilisation of riparian margins of streams	Stream REC class 2-3	0.35 Tonnes/metre
	Stream REC 4+	*Not previously assessed
Retirement of pasture areas and planting with shrubs/trees	Flat slopes	1.11 Tonnes/hectare
	Flat to moderate slopes	1.85 Tonnes/hectare
	Moderate slopes	2.91 Tonnes/hectare
	Steep slopes	*Not previously assessed
Retirement of plantation forest	Retire after harvest in 2020	1.82 Tonnes/hectare
	Retire before harvest in 2020	3.64 Tonnes/hectare

Note: *the current proposed mitigation planting does not include these categories, should future planting be proposed for these typologies an appropriate Sediment Reduction factor will need to be derived.

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Memorandum

Marine Mitigation Calculation Process

It should be noted that the modelled indicative L&E mitigation planting, which is based on the indicative alignment and associated level of design, is subject to change as the Project progresses. Only areas within the proposed designation were modelled, therefore retirement and planting of steep areas of pasture and planting of higher order streams has not been modelled to date. The forest reduction factors are based on literature not modelling, so there is potential that retiring steeper areas of forestry could increase the sediment offset. Additionally, the modelling focussed on those catchments discharging to the Kaipara Harbour where the greatest sediment yields were predicted, and the Mahurangi was not modelled.

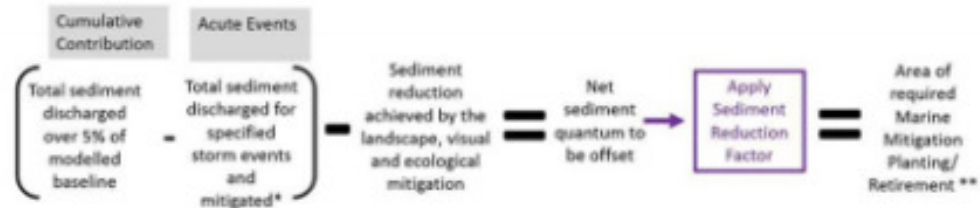
Therefore, these sediment reduction factors will need to be confirmed following detailed design as the quantum and location of the proposed landscape and ecological mitigation may change through that process.

3. Outline of Sediment Quantum Calculation Process

The steps and inputs to calculate the areas and types of planting and retirement necessary to mitigate the quantum of sediment discharged during construction are as follows:

1. Identify the quantum of sediment to be mitigated from the construction site in tonnes (to be provided by on site monitoring). This will include the sediment generated through large storm events and cumulative total of small rain fall events;
2. Calculate the quantum of sediment to be offset through the final Ecology and Landscape mitigation planting in a nominal 25-year timespan, as estimated with a modelling exercise;
3. Minus the L&E mitigation quantum (step 2) from the total sediment offset quantum (step 1), to calculate the net quantum of sediment to be offset through additional mitigation (e.g. land retirement and planting).
4. Based on the sediment reduction factor, calculate the area/length required of additional sediment mitigation planting.

Figure 1 below represents the process schematically:



* Greater than 10 year ARI derived load in the Hoteo Catchment
 * Greater than 30 year ARI derived load in the Mahurangi Catchment
 ** To enable benefits to accrue within 25 Years (nominal)

Figure 1 Process to estimate area required for additional marine mitigation planting

