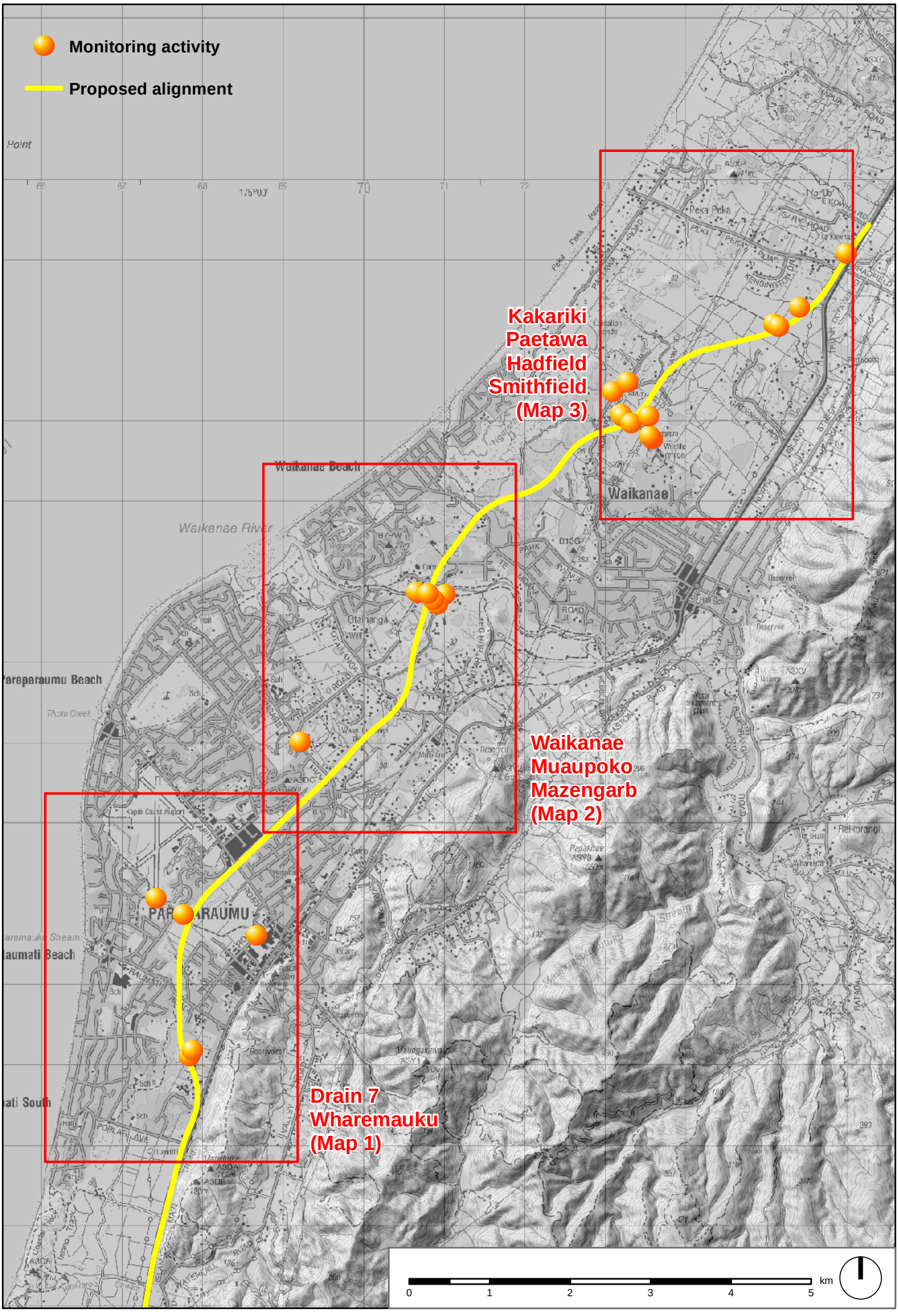

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Mackays to Peka Peka

FRESHWATER MONITORING ACTIVITIES 1

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NZ TRANSPORT AGENCY WAKA KOTAHI

Mackays to Peka Peka

FRESHWATER MONITORING

DRAIN 7/WHAREMAUKU

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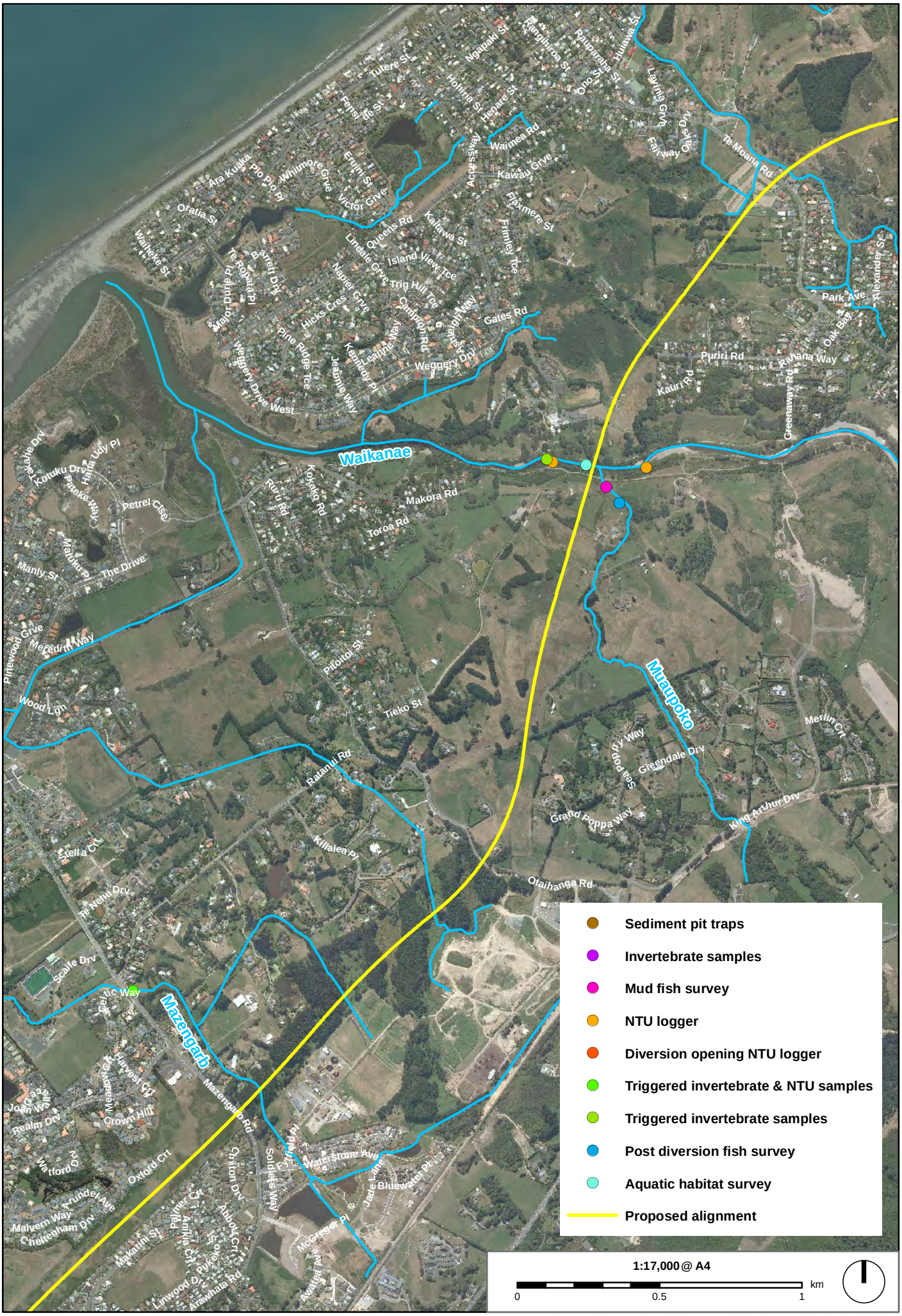

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NZ TRANSPORT AGENCY WAKA KOTAHI

Mackays to Peka Peka

FRESHWATER MONITORING

WAIKANAE/MUAUPOKO/MAZENGARB

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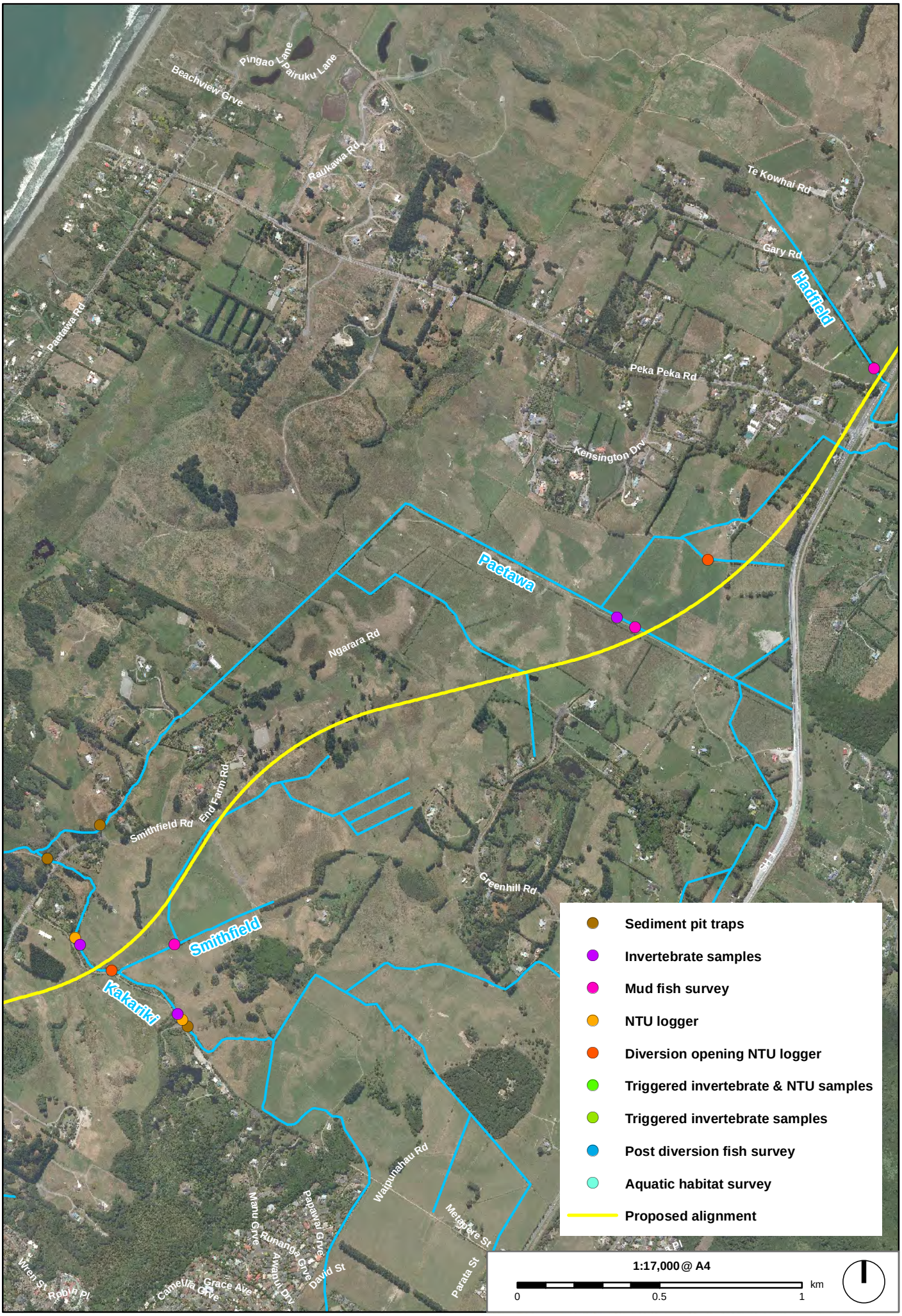

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NZ TRANSPORT AGENCY WAKA KOTAHI

Mackays to Peka Peka

FRESHWATER MONITORING

KAKARIKI/PAETAWA/HADFIELD/SMITHFIELD

4

7.6 Freshwater fauna

7.6.1 Introduction

Along the Project alignment 19 species of freshwater fish are known to occur, of which 18 species are native. Amongst these are 8 species which have a national threat status.

Stream works will occur in each of the 14 waterways being crossed by this project and the rescue and relocation of fish will be an important component of this work. In addition some of the stream works have the potential to adversely affect fish passage.

There are a number of consent conditions relating to the identification, protection, and monitoring of native fish and to the provision of habitat as mitigation for diversion and culverting of streams and associated loss of habitat.

7.6.2 Consent conditions

There are a number of consent conditions that relate to the protection and management of native fish (G.11, G.34, G.38, G.38D, G.42, WS.3A, WS.3B, WS.4, WS.11, WS.12). A number of these are the responsibility of other disciplines (WS.3A, 3B, 4, 11, and 12) but will require ecological input.

The consent conditions that relate specifically to freshwater fish are listed in full in Attachment 4.

7.6.3 Plan objectives

There are two requirements for management of indigenous fish during construction:

- Detailed design will ensure fish passage is maintained to all waterways;
- The Project will apply best endeavours to capture and translocate all indigenous fish in any affected waterway to safe habitat.

The *Stream and Aquatic Habitat Monitoring and Management Plan* (Attachment 4) provides methodologies for construction and post-

construction monitoring of stream works and sediment discharge, and adaptive management processes, as well as presenting the results of baseline monitoring.

7.6.4 Summary of baseline study results

These 19 fish species occupy different streams and habitats within streams depending on a range of factors, including proximity to the coast, water quality, habitat diversity, competition etc.

7.6.5 Protection requirements

Protection of fish is to be achieved through:

- The capture of fish from stream prior to reclamation or culverting and translocation to nearby equivalent habitat
- The minimisation of stream habitat loss and potential fish mortalities.

7.6.6 Mechanisms for protection

i. Detailed Design

- The engineers responsible for culvert design, diversions and offset flood storage area design are required to consult with the Project Ecologist over fish passage requirements.

ii. Enabling Works

- Nil

iii. Construction

- Fish rescue will need to be carried out for all streams where the current channel is reclaimed or re-aligned.
- This work needs to be closely integrated with the staging of diversion channel formation and livening and the project ecologist provided with a minimum of four weeks' notice of stream works.
- The Project Ecologists will also need to provide sign off to culvert installation with regard to fish passage.

iv. Post Construction

- Fish passage monitoring is required following completion of construction.

7.6.7 Monitoring

- Attachment 4 details the construction and post-construction monitoring required.

7.6.8 Adaptive management

i. Management Triggers

- Attachment 4 details the triggers that if exceeded, will trigger an adaptive management response for freshwater fauna, and provides options for adaptive management. In summary these triggers and tools are:
  - Failures of culverts to provide fish passage based on visual assessment of the culvert structure.
  - Failures of diversion confluences to provide fish passage based on visual assessment of the diversion.
  - Upstream fish sampling to ensure recruitment of specific fish species.

ii. Process if Adverse Effects

- In the event unanticipated adverse effects occur, an adaptive management process is required. A generic process is provided in section 8.1 Adaptive management. How this process will be applied to freshwater fauna is detailed in Attachment 4.

iii. Options for Adaptive Management

- The potential options to remedy effects on freshwater fauna will be determined on a case-by-case basis depending on a range of factors. Options may include:
  - Adaptations to culvert and diversion confluence design (including re-bedding, additional baffles, velocity abatement devices, additional gravel and works to fix erosion issues)
- The method used will be determined as part of the adaptive management process.

iv. Additional Mitigation

- Nil

7.6.9 Linkages

Nil

7.6.10 Roles and responsibilities

In summary the responsibilities for freshwater fauna are:

i. Design Team (Roading and Structures)

- Ensuring all in stream structures are designed to provide fish passage.

ii. Construction and Earthworks Teams

- Responsible for developing stream diversion methodologies and staging with the Project Ecologist
- Responsible for avoiding works in perennial or intermittent waterbodies during the fish migration and spawning periods.

iii. Environmental Manager

- Communication with Project Ecologist through staging of culvert, diversion and bridge installation works, including provision of sufficient prior notice of works in and around perennial and intermittent waterbodies to allow successful fish rescue.

iv. Project Ecologist

- Environmental Awareness Training of personnel responsible for supervising earthwork site staff in conjunction with the Environmental Manager.
- Responsible for fish capture and transfer during culvert construction, riprap installation and stream diversion.
- Obtain necessary fisheries permits through the Ministry for Primary Industries and reporting.

7.7 Valued wetlands and habitat

7.7.1 Introduction

Historically the Kāpiti Coast dune country would have comprised large areas of wetland vegetation. Today, only small fragments of wetlands occur, many of which are surrounded by rough pasture, exotic forest or shelterbelt, or weedland dominated by gorse and blackberry.

Given the historical loss of wetlands on the Kāpiti Coast, the value of these wetlands as habitat is increased by their rarity and their protection is a priority. A large number of wetlands close to, or within the Designation, are scheduled in the Kāpiti Coast District Plan with provisions that require their maintenance and protection.

7.7.2 Consent conditions

There are a number of consent conditions that relate to the protection and management of wetlands (DC.54, G.27, G.34, G.38 a), G.38 B, G.40, G.41, G.42 b), G.42 A), GD.5 and GD.7. A number of these are the responsibility of other disciplines (e.g. DC.54) but will require ecological input.

The consent conditions that relate specifically to wetlands are listed in full in Attachment 5.

7.7.3 Plan objectives

There are five primary requirements for indigenous wetlands.

- Detailed design will avoid or minimise effects as far as practicable;
- Mechanisms will be developed to maintain and protect areas of wetland habitat that lie within the Project Footprint and Designation but which do not need to be cleared;
- Mechanisms will be developed to minimise the impact on areas of wetland habitat where complete loss is not required.
- Mechanisms will be developed to minimise hydrological impacts on areas of valued habitat where complete loss is not required.
- Mechanisms will be developed to monitor wetland health and hydrology during and for 5 years post-construction.

7.7.4 Summary of baseline studies

Consent condition (G.41) requires that a detailed map be prepared identifying all areas containing indigenous wetlands. This map is contained in the *Wetland Monitoring and Management Plan* (Attachment 5).

The map highlights the seven sites of valued wetland habitat identified in condition G.41 c) ii) that will be affected or which could potentially be affected by works. Each area is shown in the figures that follow (Map 15 to Map 21). They are:

Site Name	Chainage
Raumati Manuka Wetland Loss of 0.03 ha of this 2.0 ha wetland. Remainder to be avoided and/or effects remedied.	Between 3700 & 3900
New wetland created adjacent to Wastewater Treatment Plant Requires formation and transfer of plants and materials from other wetland reclamation, as well as associated restoration planting.	Between 8525 & 8650
Southern Otaihanga Wetlands Loss of 0.55 ha of this 1.4 ha wetland. Remainder to be avoided and/or effects remedied.	Between 8700 & 8800
Northern Otaihanga Wetland Loss of 0.53 ha of this 1.0 ha. Remainder to be avoided and/or effects remedied.	Between 9250 &9150
El Rancho Wetland (Weggery) Loss of 0.38 ha of this 3.9 ha wetland. Remainder to be avoided and/or effects remedied.	Between 10900 &11050
Tuku Rakau Wetland This 0.3 ha wetland is to be avoided and/or effects remedied.	Between 11300 &11400
Ngarara Wetland Loss of 0.01 ha of the dry buffering edges adjacent to this 2.7 ha wetland. Wetland and surrounding buffering vegetation to be avoided and/or effects remedied.	Between 13600 &13750

The *Wetland Habitat Monitoring and Management Plan* (Attachment 5) provides methodologies for construction and post construction monitoring of wetland vegetation clearance, wetland condition and hydrological change, an adaptive management process where it proves necessary, as well as presenting the results of baseline monitoring.

7.7.5 Protection requirements

The consented project footprint will affect the seven sites of valued wetland vegetation and habitat to the extent shown in the following Table. The protection requirements are given.

Site Name	Protection Requirements
Raumati Manuka Wetland	Loss of 0.03 ha of this 2.0 ha wetland. Remainder to be avoided and/or effects remedied.
New wetland created adjacent to Wastewater Treatment Plant	Requires shaping and development to form wetland and the transfer of plants and materials from other wetland reclamation.
Southern Otaihanga Wetlands	Loss of 0.55 ha of this 1.4 ha wetland. Remainder to be avoided and/or effects remedied.
Northern Otaihanga Wetland	Loss of 0.53 ha of this 1.0 ha. Remainder to be avoided and/or effects remedied.
El Rancho Wetland (Weggery)	Loss of 0.38 ha of this 3.9 ha wetland. Remainder to be avoided and/or effects remedied.
Tuku Rakau Wetland	This 0.3 ha wetland is to be avoided and/or effects remedied.
Ngarara Wetland	Loss of 0.01 ha of the dry buffering edges adjacent to this 2.7 ha wetland. Wetland and remainder of the surrounding buffering vegetation to be avoided and/or effects remedied.

7.7.6 Mechanisms for protection

i. Detailed Design

- The locations of these seven areas of wetland will be shown on the SSLMPs and where areas of wetland are retained landscape design will seek to provide buffering to them and expand their extent with the use of appropriate species in neighbouring landscape planting.
- Any changes to detailed design must consider the potential impact on these wetlands, including hydrological effects on adjacent wetlands. If the extent of wetland loss increases through detailed design, additional mitigation may be required.

ii. Enabling works

- During the site establishment phase of construction, each area of wetland will be clearly identified, the extent of clearance agreed with the Project Ecologist (in consultation with the Project Landscape Architect), and vegetation clearance limited to those agreed areas.

iii. Construction

- During the site establishment phase of construction, each area of wetland will be clearly marked, the extent of clearance agreed with the Project Ecologist (in consultation with the Project Landscape Architect), and vegetation clearance limited to those agreed areas.
- Hydrological and wetland health monitoring will occur throughout the construction phase, including joint reviews of piezometer information with the Groundwater Team.

- The management of pests and weeds immediately within and adjacent to these wetland areas will be detailed in the SSLMPs and/or the SSEMPs. This management and responsibilities will fall under contracts let by the Alliance.
- Weed surveys will be carried out twice a year, in spring and autumn to track the introduction of weeds and their spread and to recommend appropriate management of these weeds, particularly in relation to areas of ecological value.

iv. Post Construction

- (Refer section 7.9 Mitigation).

7.7.7 Mechanisms for protection

a. Detailed Design

- The design team are to continue to be briefed by the Project Ecologist on the ecological values of the areas of wetlands outlined above and the implications of any design or construction changes. The EMP is to form part of that briefing.
- The Project Ecologist shall be involved in any aspects of detailed design immediately adjacent to / or that have the potential to affect the ecological values of areas of wetlands. This will include the development of designs that minimise effects on wetlands, such as consideration of lined flood storage ponds, flow-balancing culverts or the incorporation of starter drainage layer of granular engineered fill as part of the pre-load and surcharge embankment construction to maintain existing hydraulic cross-flows within any wetlands.
- The locations of these areas of wetland will be shown on the SSLMPs and where areas of wetland are retained within the Designation landscape design will provide buffering to them and expand their extent with the use of appropriate species in neighbouring landscape planting (through the LMP, SSEMP's and SSLMP's).
- Best endeavours will be undertaken to minimise loss of any wetland vegetation within the project footprint during detailed design through the involvement of the Project Ecologist and Project Landscape Architect, including a specific focus on minimising effects of the CWB through the Raumati Manuka Wetland and the Otaihanga Southern and Northern Wetlands (for example, through the use of boardwalks or steepening up embankments).
- Any changes to detailed design must consider the potential impact on these areas of wetland, including hydrological effects on adjacent wetlands and potential resource consent, mitigation and consultation requirements in respect of any loss or modification to these areas.
- If the extent of consented habitat loss or modification increases through detailed design, additional ecological mitigation that reflects the indigenous habitat types and ecological functioning and is based on the development of similar representative vegetation communities may be required as per condition G.42A. Any additional mitigation requirements will be determined by the Project Ecologist in consultation with GWRC and any additional resource consents sought.

b. Enabling works

- During the site establishment phase of construction, each area of wetland will be clearly identified by flags (tape) and temporary fencing, the extent of clearance agreed with the Project Ecologist (in consultation with the Project Landscape Architect), and that extent identified by both fencing and dazzling of trees to be removed – and vegetation clearance limited to those agreed areas.
- Hydrological and wetland health monitoring will occur throughout the construction phase, including joint reviews of piezometer information with the Groundwater Team.
- The management of pests and weeds immediately within and adjacent to these wetland areas will be detailed in the SSLMPs and/or the SSEMPs. This management and responsibilities will fall under contracts let by the Alliance.
- Weed surveys will be carried out twice a year, in spring and autumn to track the introduction of weeds and their spread and to recommend appropriate management of these weeds, particularly in relation to wetlands. These surveys will fall under contracts let by the project Landscape Architect.

c. Construction

i. Environmental Awareness Training

- Personnel responsible for supervising construction earthwork site staff (i.e. foremen, supervisors and managers) shall undergo environmental awareness training of all areas of ecological value within the Designation. This training shall be undertaken in conjunction with the Project Ecologist and shall occur prior to the commencement of Work in any Stage and shall be given by a suitably qualified and experienced person.
- With regard to areas of wetland, this training is to be provided by the Project Ecologist to all supervisory and management personnel likely to be involved in any work involving vegetation clearance or earthworks, including briefing on the following:
- The values of all wetlands that are within the Project Footprint.
- The methods that shall be used to identify and protect each area during construction.
- The implications of any wetland loss or modification outside of the Project Footprint, including resource consent and mitigation requirements.
- The contingency response procedures should there be any additional wetland loss or modification outside of the Project Footprint.

ii. Vegetation Clearance

- The Project Ecologist is to be on site during clearance or modification of any part of the valued indigenous vegetation in the seven identified sites; and
- The Project Ecologist is to be notified when earthworks are to occur within 10m of any of these seven areas of indigenous vegetation.

iii. Salvage

- During indigenous vegetation clearance within wetlands, consideration must be given to the salvage of components of any wetland vegetation that is to be cleared. Salvage requirements will be detailed within the site specific landscape management plans (SSLMP) and/or the applicable SSEMP.
- Salvage is to include mulch, logs, soils and duff, and any plants that are likely to survive translocation to a new site. These species are to be identified in the SSLMP and/or the applicable SSEMP.

d. Post Construction

- Each area of wetland will continue to be monitored for 5 years following construction to ensure that there are no further effects, including hydrological effects, species die-back, weed invasion etc.

7.7.8 Monitoring

- Attachment 5 details the construction and post-construction monitoring required. In summary, this comprises the following:
  - Observation of vegetation clearance and immediately following.
  - Bi-annual surveys following vegetation clearance.
  - Wetland Condition Monitoring to monitor wetland health and function.
  - Hydrological (piezometer) monitoring (refer the Groundwater Management Plan).
  - Mitigation success monitoring within mitigation wetlands.
- This monitoring will be carried out by the Project Ecologist based on methods detailed in Attachment 5 and reports will be prepared accordingly.

7.7.9 Adaptive management

a. Management Triggers

The following management triggers will be monitored.

Attribute	Measure	Management Trigger
Extant valued vegetation (G.41)		
Total vegetation community area	The project clears more extant indigenous vegetation than consents allow (G.42)	> 1.8 ha of valued wetland vegetation lost or modified
Specific weed threats	Weeds currently not present in each area are introduced to the site or clearance encourages increase in invasive weed presence	Increase in either weed extent or diversity in response to vegetation clearance
Domestic stock access	Presence of stock and effect of grazing on extant vegetation.	Increase in browse damage.

Wetland Hydrology		
Baseline seasonal hydrology	Piezometer monitoring	See GMP
Wetland Condition Monitoring	A 3 point change in two or more of the following Wetland Condition Monitoring parameters based on the corresponding summer (with low groundwater levels) or winter (with elevated groundwater levels) baseline condition surveys.	▪ Total Wetland condition Index /25; or ▪ Total wetland pressure index /30; or ▪ Indicator Score for each Wetland Condition Monitoring Plot /20; or ▪ A change in vegetation structure within the monitored wetland;
Mitigation planting (G.43)		
Total area of planted or restored wetland vegetation.	Area of revegetation does not meet consent requirements (G.42)	< 9.5 ha of wetland planting achieved
Wetland	Failure to achieve required proportions of mitigation for communities lost	< 4.1 ha sedge rushland < 1.3 ha Cyp Ust dune depressions < 4.0 ha manuka wetlands <0.2 ha manuka sphagnum wetlands
Plant survival	Survival of a minimum of 80% of plant species.	>20% loss of plants at 4 years
Indigenous canopy closure	Canopy closure of a minimum of 80% within the planted areas.	< 80% canopy closure at 4 years
Invasive weeds	Weeds currently not present in each area are introduced to the site or clearance encourages increase in invasive weed presence	Increase in either weed extent or diversity in response to vegetation clearance
Natural processes	Natural colonisation by other non-planted indigenous species.	Absence of colonisation of native species.
Wetland Salvage	Salvage and transfer of wetlands components from wetlands beneath project footprint to restored wetlands	Subjective assessment of plant survival.

i. Process if Adverse Effects

In the event unanticipated adverse effects occur, an adaptive management process is required. A generic process is provided in section 8.1 Adaptive management. How this process will be applied to wetlands is detailed in Attachment 5.

ii. Options for Adaptive Management

The potential options to remedy effects on wetlands will be determined on a case-by-case basis depending on a range of factors. Options may include but are not limited to:

- Additional monitoring to determine severity and develop remedial or mitigation responses.
- Replanting of areas where die back has occurred.
- Construction of new outlets and/or adjustable weir systems to control wetland hydrology.
- Temporary manual raising or lowering of water levels in response to hydrological changes.
- Extending planting to better buffer affected vegetation.
- Restoration of other wetlands within or outside of the Designation.

The method used will be determined as part of the adaptive management process.

iii. Additional Mitigation

If effects caused during construction cannot be remedied, or if mitigation success monitoring shows that mitigation targets have not been achieved post-construction, additional mitigation may be required. A generic process for determining additional mitigation is provided in section 8.2 Response to observed effects. How this process will be applied to valued indigenous vegetation is detailed in Attachment 5.

7.7.10 Linkages

The key plans relating to valued wetland habitat, in addition to this EMP, are the SSEMPs as they relate to the 6 ecological mitigation areas, the LMP and the SSLMPs (DC.53C to DC.58) which are required to also show the locations of wetlands and areas of mitigation and revegetation along the Project alignment.

- In addition, there are a number of conditions specific to other activities that overlap with protection of the ecological values of wetland habitat. They are:
- An overlap between the EMP and the Groundwater (Level) Management Plan (GMP) under conditions G.28A – G.29 as it relates to wetlands and stream flows;
- An overlap between the Construction Erosion and Sediment control plans (CESCPs) under Conditions E.1 to E.11 as they relate to events such as exceedances of water quality triggers in streams or impacts on wetlands or the marine environment;

- An overlap with conditions relating to Groundwater take (**GT.1** to **GT.6**) where they relate to potential effects on streams and wetlands and necessary mitigation;
- An overlap with conditions relating to Groundwater Diversion (**GD.1** to **GD.8A**) where they relate to adverse ecological effects on wetlands and involvement of an ecologist; and
- An overlap with condition **WR.1** which identifies the maximum extent of consented wetland reclamation.

These conditions require liaison and coordination through design and construction between the Project Ecologist and the Erosion and Sediment Management team, the team responsible for in stream works and diversions, and the hydro-geologists responsible for ground water take and wetland hydrology monitoring.

7.7.11 Roles and responsibilities

In summary the responsibilities for wetland vegetation are:

i. Design Manager (Roading and Structures)

- Responsible for taking into account all areas of wetland vegetation identified above within the Project Footprint during detailed design.
- Responsible for working with the Project Ecologist during detailed design to consider the ecological values of the areas of valued indigenous vegetation.
- Responsible for designing mechanisms to minimise potential hydrological effects on wetlands within the Designation and up to 200 m outside the road embankments through detailed design.

ii. Environmental Manager

- Responsible for Environmental Awareness Training of personnel responsible for supervising earthwork site staff, including liaison with Project Ecologist for specialist ecological input into training in regard to areas of valued indigenous vegetation and habitat.
- Responsible for communication with the Project Ecologist through staging of earthworks and wetland vegetation clearance, including prior notice of works in and around wetlands.
- Responsible for notifying the Project Ecologist if unanticipated adverse effects have occurred or may occur and, in conjunction with the Project Ecologist, reporting to GWRC and KCDC.
- Responsible for contingency response and briefing of Project Ecologist in the event of any adverse effects beyond demarcated areas of valued indigenous vegetation and habitat.
- Responsible for obtaining, in consultation with Project Landscape Architect and Project Ecologist, any resource consents and/or necessary approvals from KCDC and GWRC for any ecological mitigation for effects on the areas of wetland vegetation and habitat beyond that consented.

iii. Groundwater Team

- Responsible for monitoring and reporting of piezometer information from wetlands identified in Condition G.38B to the Project Ecologist during construction and for 5 years post-construction.

iv. Site Foreman

- Responsible for liaison with Project Ecologist to demarcate the areas of wetland prior to earthworks or vegetation clearance.
- Responsible for avoiding sites demarcated as being wetland vegetation.
- Responsible for reporting to the Environmental Manager and Project Ecologist if effects may or have extended into areas of wetland vegetation that were to be avoided.
- Responsible, in conjunction with the Project Ecologist, for salvaging areas of wetland vegetation within the Project Footprint and appropriate storage and transplanting of any wetland vegetation within the ecological mitigation areas (SSEMPs).

v. Project Landscape Architect

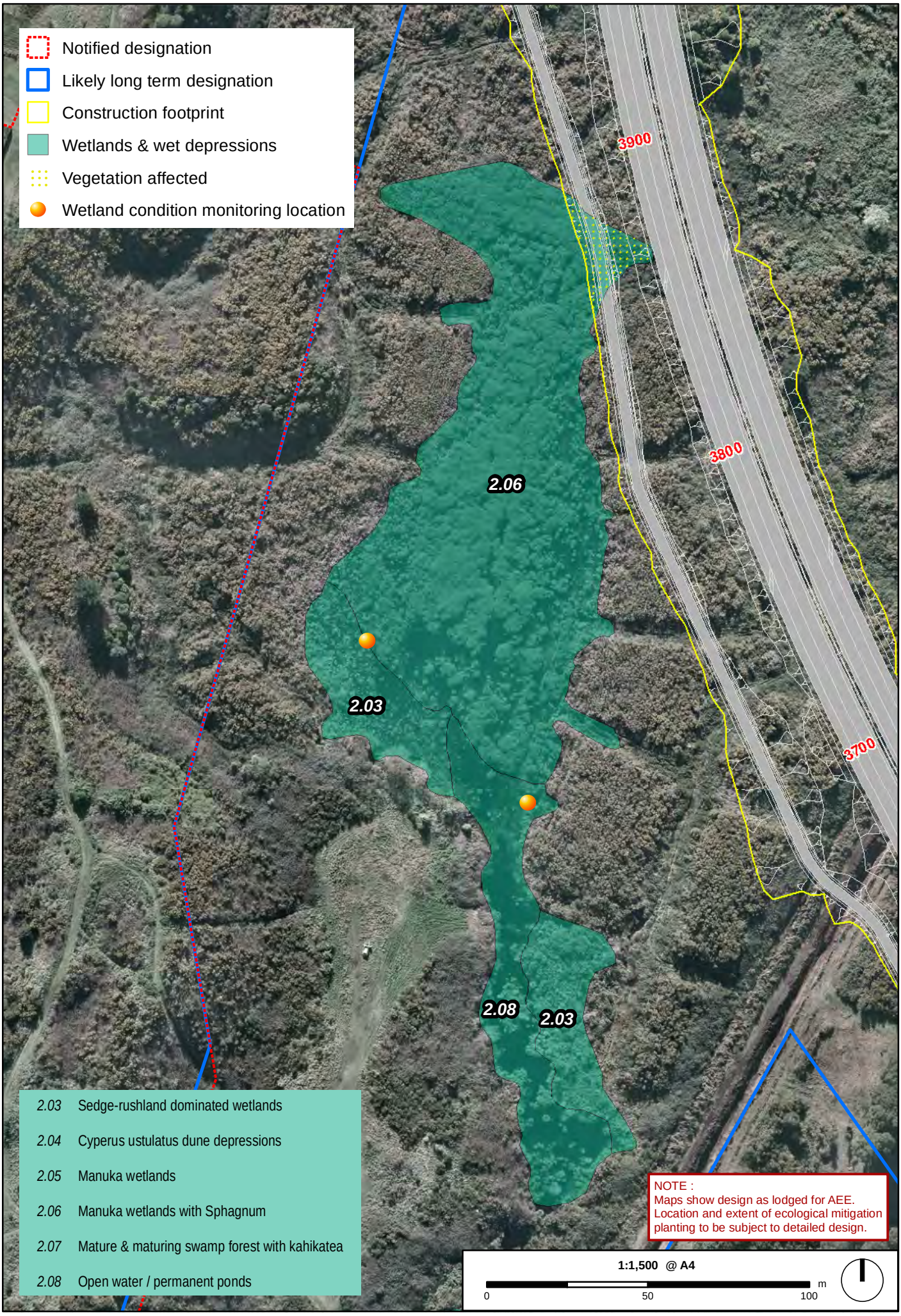
- Responsible for liaising with the Project Ecologist during development of the LMP and SSLMPs.
- Responsible for coordination with Project Ecologist during development of the EMP and SSEMPs.
- Responsible for incorporation of indigenous wetland vegetation in design of revegetation programmes in SSEMPs and SSLMPs.
- Responsible for developing, in conjunction with the Project Ecologist, weed and browsing pest management programmes within the SSLMPs and SSEMPs.
- Incorporation of wetland vegetation in design of revegetation programmes in SSEMPs and SSLMPs.

vi. Project Ecologist

- Responsible for liaising with design teams during detailed design to ensure that impacts on areas of indigenous vegetation are minimised as far as practicable.
- Responsible, in conjunction with the Project Ecologist and Project Stormwater Engineer, for developing the SSEMPs, including liaison and inputs from specialist technical ecologists (avi-fauna, freshwater, terrestrial, herpetofauna and wetland).
- Responsible for input into specialist ecological aspects of Environmental Awareness Training of personnel responsible for supervising construction and earthwork site staff.
- Responsible, in conjunction with Environmental Manager and Project Landscape Architects, for identification and demarcation of sites of valued indigenous vegetation prior to earthworks.
- Responsible for observing any indigenous vegetation clearance or modification within the areas of valued indigenous vegetation during construction.
- Responsible, in conjunction with the Construction and Earthworks Team, for identifying areas and particular species of wetland vegetation to be salvaged within the Project

Footprint and advising on appropriate removal, storage and transplanting of wetland vegetation within the ecological mitigation areas (SSEMPs).

- Responsible for developing, in conjunction with the Project Landscape Architect, weed and browsing pest management programmes within the SSLMPs and SSEMPs.
- Responsible for carrying out ongoing monitoring of the ecological components of wetlands, including reviewing piezometer results from Groundwater Team, and reporting.
- Responsible for undertaking biannual Wetland Condition Monitoring surveys at identified wetland locations.
- Responsible for responding, in conjunction with the Environmental Manager, to any unintended adverse effects or breaches of monitoring triggers for the areas of valued indigenous vegetation and habitat.
- Responsible for developing, in conjunction with Environmental Manager and Project Landscape Architect, any adaptive management programmes in the event Project effects are greater than consent conditions allow.
- Responsible for sign-off of all ecological mitigation components of each SSEMP area following completion of plant maintenance periods (including relevant sign off from specialist ecologists as appropriate).
- Responsible for developing, in conjunction with Environmental Manager and Project Landscape Architect, any mitigation for effects on the areas of wetland habitat beyond that consented.



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NZ TRANSPORT AGENCY WAKA KOTAHI

Mackays to Peka Peka

WETLAND VEGETATION
RAUMATI MANUKA WETLAND

1

June 14, 2013 W09181B_WET_ValuedWetlands_A4mb.mxd

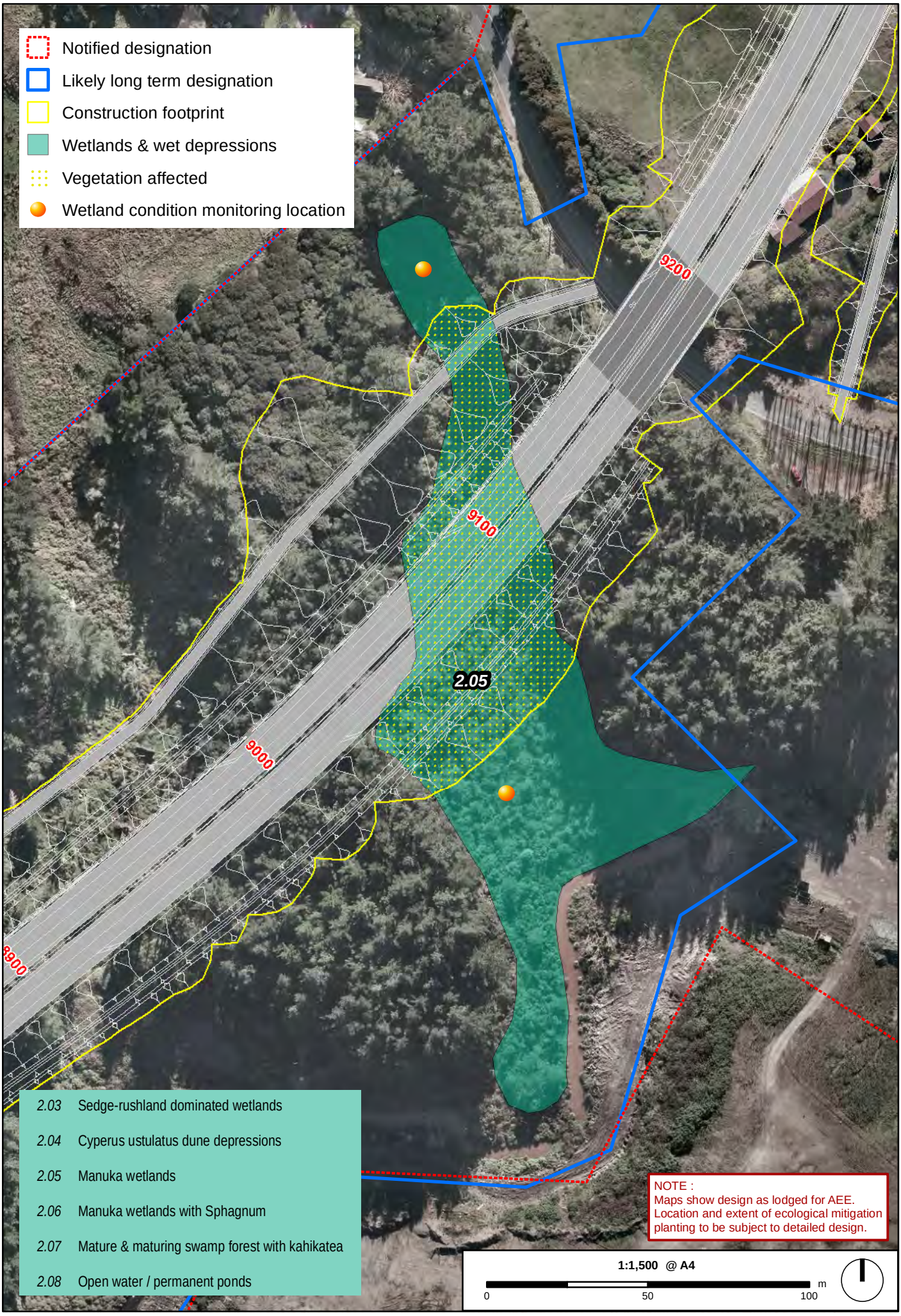
NZ TRANSPORT AGENCY WAKA KOTAHI

Mackays to Peka Peka

WETLAND VEGETATION

OTAIHANGA SOUTHERN WETLAND

2



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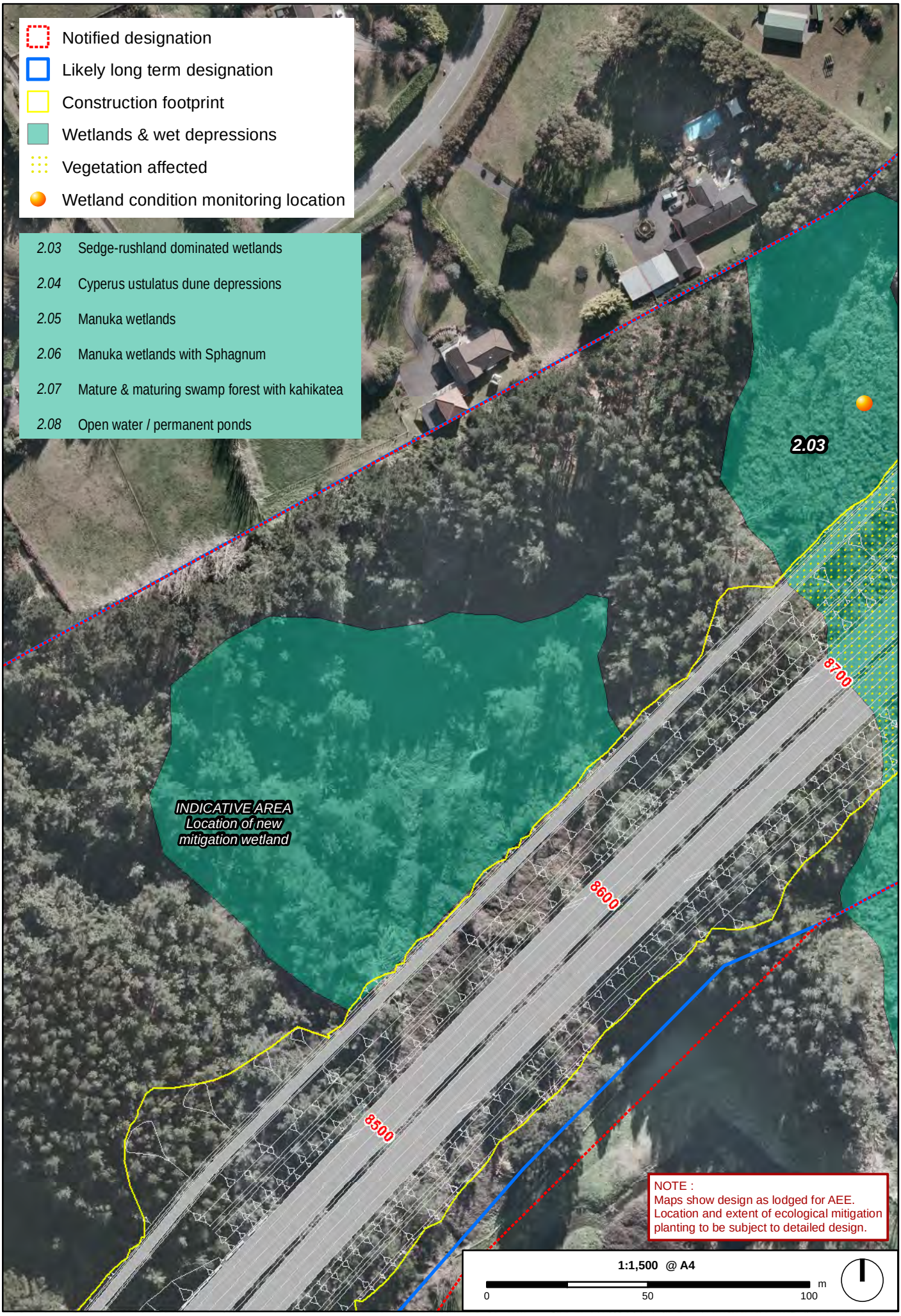
NZ TRANSPORT AGENCY WAKA KOTAHI

Mackays to Peka Peka

WETLAND VEGETATION
OTAIHANGA NORTHERN WETLAND

3



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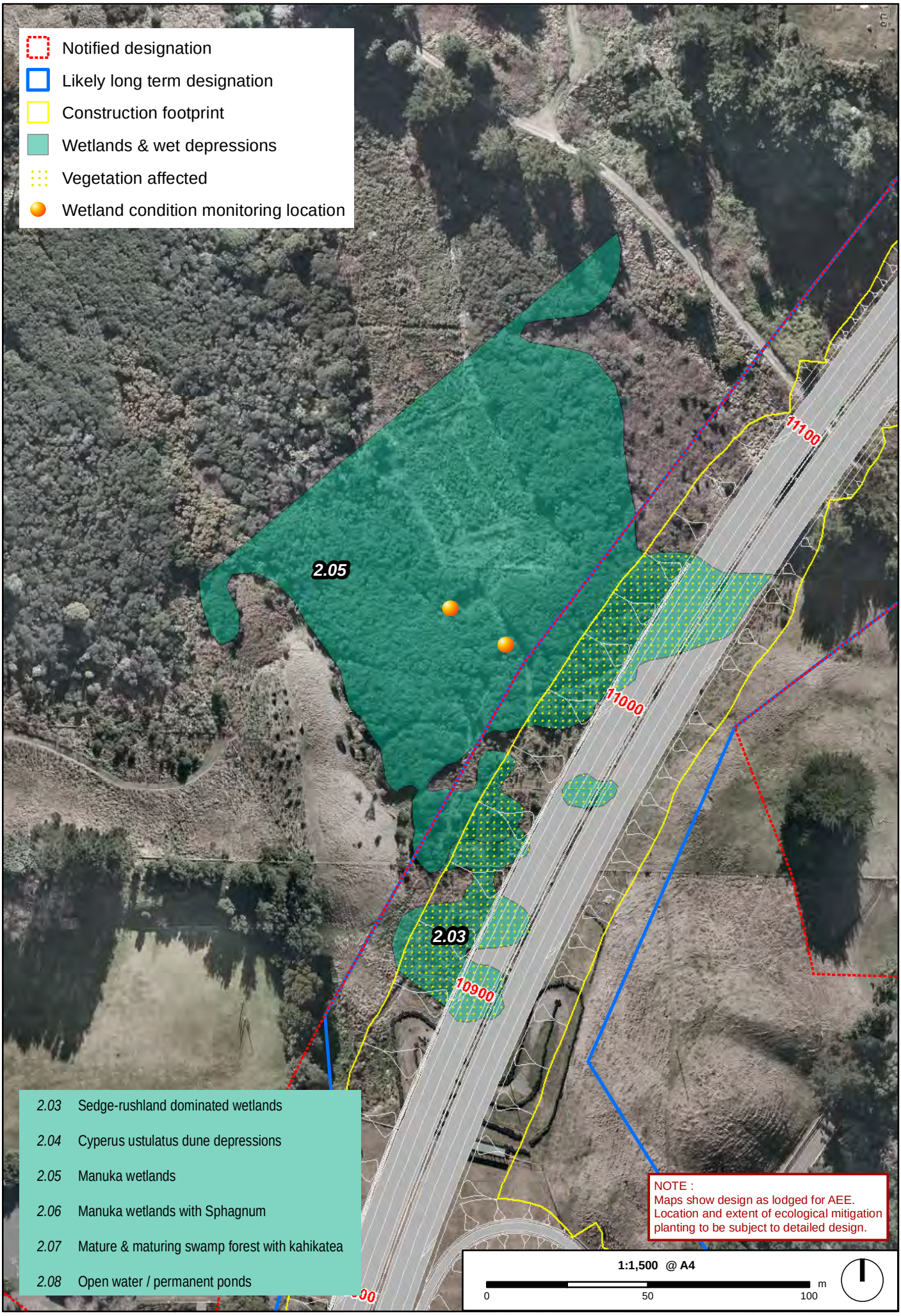
NZ TRANSPORT AGENCY WAKA KOTAHI

Mackays to Peka Peka

WETLAND VEGETATION
NEW WETLAND (WWTP DRAIN)

4



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NZ TRANSPORT AGENCY WAKA KOTAHI

Mackays to Peka Peka

WETLAND VEGETATION
EL RANCHO (WEGGERY) WETLAND

5