

Tongariro River Flood Protection Scheme

Proposed Annual Works Programme 2022/2023

(updated 20 June 2022)

Resource Consents 121305 and 121306

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Proposed Annual Works Programme

Introduction

Waikato Regional Council operates and maintains a flood protection scheme on the Tongariro River. The scheme is designed to protect the Turangi community from a 1 in 100-year flood event (1,500 m³/s), also known as the 1% Annual Expected Probability (AEP) flow, which has a 1% statistical probability of occurring in any one year based on the existing flow records. The flow of water down the Tongariro River have been continuously recorded since 1957 by a gauge located at Turangi. An average flow is between 20 and 25m³/s and the recent fresh during late June was recorded at just over 200m³/s. Two extreme floods (recorded in 1958 and 2004) both exceeding 1400m³/s. The river transports large amounts of sediment through the upper catchment with thousands of tons of gravel and larger size sediment (and a significantly higher amount of finer sized material including sand) carried past Turangi each year, depositing in the river's delta downstream of Turangi. Continued monitoring and maintenance of the flood protection assets, the floodway and main channels is required to ensure the scheme operates to design standards.

Consultation

In 2011, comprehensive resource consents were granted to the Waikato Regional Council's Integrated Catchment Management Directorate (ICM) for the management of the river floodway and flood protection scheme.

RC #	Activity authorised
121305	Erosion control/flood protection works: gravel extraction up to 150,000cum/year, erosion control works and vegetation removal, temporary diversion bunds and culvert crossings.
121306	Divert water and temporarily dam and divert water within the Tongariro River.

Consent conditions 37 – 39 require the distribution of a proposed Annual Works Programme (AWP) to allow consultation and input from the following parties,

- Department of Conservation,
- Tongariro and Lake Taupo Anglers Club Inc,
- Advocates for the Tongariro River,
- Taupo Fishery Advisory Committee,
- Tuwharetoa Maori Trust Board,
- Ngati Turangitukua,
- Genesis Energy, and,
- Waipapa and Tokaanu Maori Lands Trust.

In addition, the proposed AWP will be provided to Te Kotahitanga o Ngāti Tūwharetoa (established under the Ngāti Tūwharetoa Claims Settlement Act 2018 and after the resource consents relating to the maintenance of the Tongariro River Flood Protection Scheme were granted).

The purpose of this AWP is to:

- Highlight proposed works,
- Outline how they will be managed in accordance with best practice and within the conditions of the consent,

- Allow parties to consider whether the proposed works will impact on sites of importance and/or species of significance, and
- Encourage discussions around appropriate solutions to concerns.

Scheme Overview

The Tongariro flood protection scheme is comprised of:

- **Flood protection assets:** The management focus is to maintain structural integrity and design freeboard height.
- **River channel and floodway:** The management focus is to maintain channel stability and flood scheme capacity.

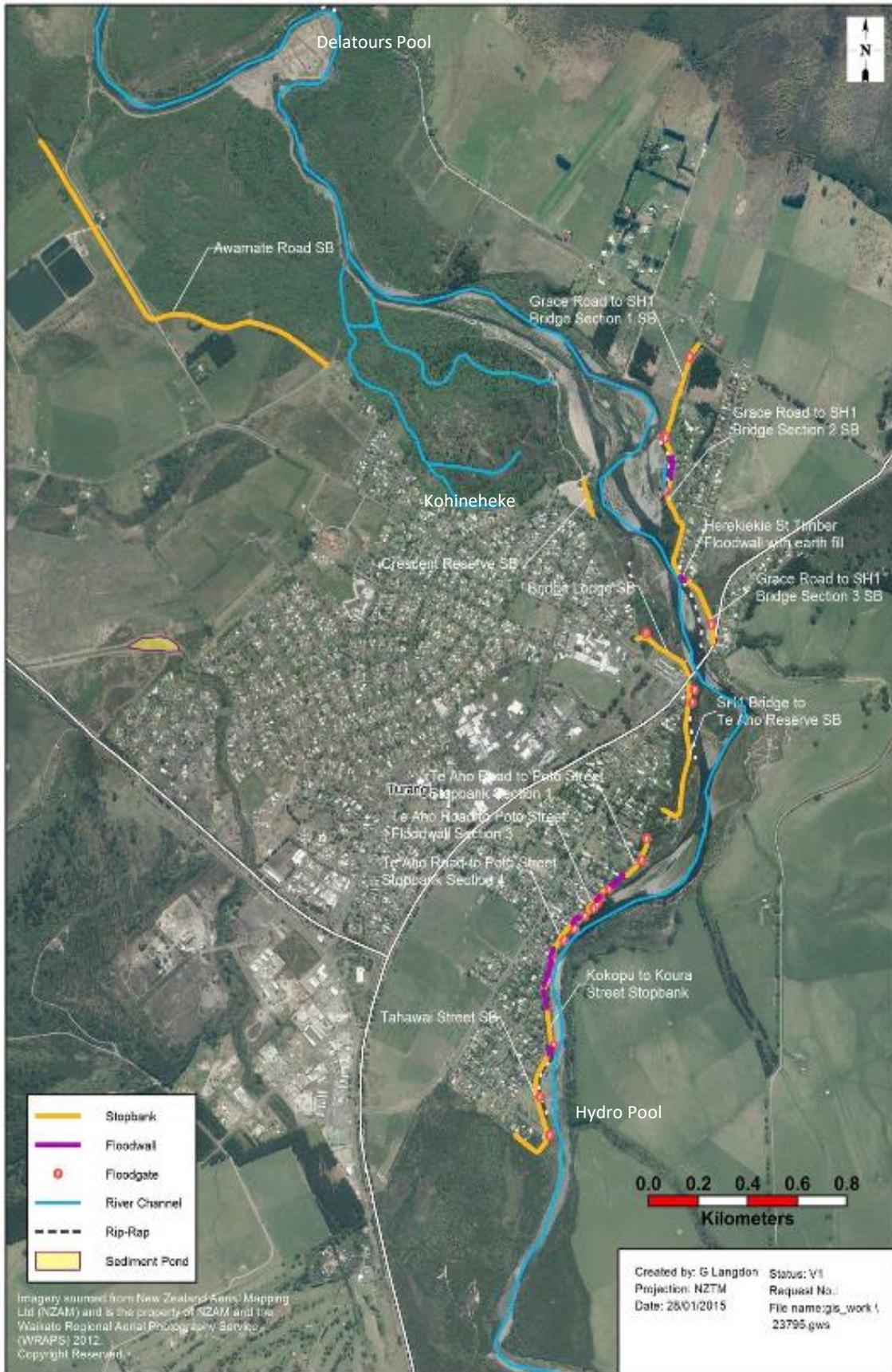


Figure 1: Tongariro River Flood Control Scheme

Scheme Assessment

This assessment relates primarily to the flood scheme reach. This assessment was undertaken by the Taupo Zone River and Catchment Staff, and WRC's Principal Technical Advisor.

Tongariro River Reach (Hydro Pool to State Highway 1 Bridge)

This reach of the river starts upstream of the Kutai Street/Tahawai Street Stop Bank. The true left bank along the Tahawai Street Stop Bank is protected by a rock revetment. A prominent deep river channel runs hard against the revetment and a shallow narrow channel flanks the right of a central gravel island. Invasive vegetation growth and gravel build up has increased pressure on the true left revetment. Juvenile invasive vegetation has been spot sprayed and established woody vegetation drilled and poisoned.

- 1. It is recommended to continue to manage woody vegetation on the gravel island allowing gravel to move through the system.**

Further downstream from Tahawai Street to Taupahi Reserve, the river channel is generally confined and stable. Juvenile invasive vegetation has been previously managed by a summer spot spray program.

- 2. It is recommended to continue to manage woody vegetation within the floodway.**

Downstream of Taupahi Reserve to SH1 Bridge, the channel is wider with significant gravel islands. Mature trees, indigenous and exotic, have established. Flood flows can dislodge mature trees and build up a debris barrier under SH1 Bridge. This situation occurred during 2004 flood causing the bridge to be closed due to risk of failure. Wilding pines are also prevalent upstream of the SH1 bridge and should be controlled to avoid potential issues in the longer term.

- 3. It is recommended to continue to manage woody vegetation within the floodway and that mature vegetation is controlled through a staged management programme.**

Vegetation has established within the rock revetments that protect areas of the true left bank. Mature vegetation is a threat to the structural integrity potentially dislodging rock from the revetments during high flows.

- 4. It is recommended that mature vegetation is controlled through a staged management programme and that juvenile vegetation is managed annually.**

Tongariro River Reach (State Highway 1 Bridge to De Latours Pool)

This reach is an actively building fan dominated by greywacke gravels with some volcanic stones. The gravels are flushed downstream during high flows and generally move through the system settling out below the SH1 Bridge. Splitting and reforming of channels in this reach is a function of gravel build up.

The reach extending approximately 200m from a point immediately downstream of SH1 Bridge has remained stable over the last 12 months.

The Te Herekieke Street to Grace Rd fishing access reach has a significantly wider flood plain with a large central island. The island has a channel flanking each side and is becoming heavily vegetated in invasive species. Continual gravel build-up in this reach is reducing flood scheme capacity and threatening channel stability.

Continued gravel build-up of this island is contributing to the following effects...

- Increased flow through the left channel,
 - Deepening and widening of the left channel,
 - Significant erosion to the true left bank,
 - Increased risk of channel instability during flood,
 - Loss of flood scheme capacity in this reach, and
 - Increased flooding of land to both sides of the river,
5. **It is recommended that channel stability and flood scheme capacity is restored through removal of invasive vegetation and gravel extraction from the central island. It is noted that this work will unlikely occur in the 2022/23 year and is more likely to be planned this year to undertake physical work in 2023/24 year. This is due to the engagement and resourcing required for this component of the work, including uncertainties about where to dump excavated material.**

2022-2023 Works Season

Permitted Activities

General Maintenance

Includes, managing emerging invasive vegetation on all assets identified in Fig 1. This includes rock walls, stop banks and floodgates/flap valves. Thinning or removal of flood deposited debris blockages and replacement and maintenance of damaged assets and asset components may also be required.

Planned Asset Maintenance

SH1 Bridge to Te Aho Reserve rock protection and Floodgate Flap Valves.

Culvert 1 & 2 Floodgates situated on the SH1 Bridge to Te Aho Reserve Erosion Control Rock Wall are currently unserviceable due to invasive vegetation growing within the structure, preventing access to inspect or maintain. The vegetation is also a threat to the rock wall stability. All vegetation within the rock wall will be managed by removing woody vegetation and spot spraying emerging vegetation. Vegetation growing at the base of the stop bank will be mechanically mulched so that roots do not threaten the stability of the structure.

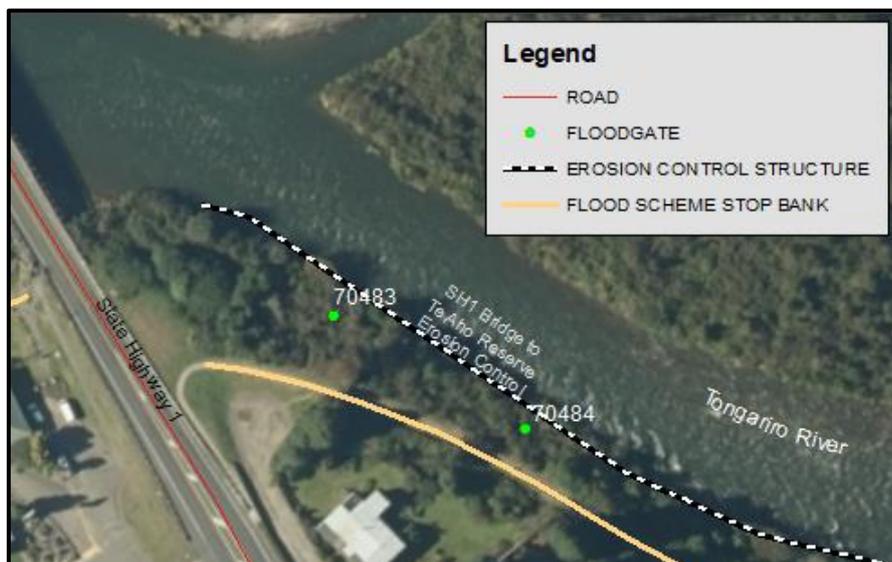


Figure 2: SH1 Bridge to Te Aho Reserve rock protection, Floodgate Flap Valves and stopbank location.

Vegetation Management

Gravel movement through the system is restricted by invasive vegetation. This has short term implications for the flood scheme and will also have longer-term impacts on the natural function of the river.

Invasive vegetation growth throughout the floodway is...

- Restricting the rivers natural functions.
- Promoting an unnatural rate of gravel and sediment aggradation.
- Decreasing flood scheme capacity and increasing channel instability.
- Reducing native/natural ecosystems and habitat, and is,
- Limiting recreational opportunity.

It is important that invasive vegetation control is ongoing and managed annually to ensure these invasive species do not become dominant and uncontrollable. Target species predominantly include, but are not limited to, Willow, Broom, Wildling Pine, Buddleia. The target area for this works season is confined to the flood scheme reach of the River (Hydro Pool to Delatours Pool).

Methods used to control vegetation will vary depending on the site, but will be in accordance with best practice, such as...

- Ground crew spot spraying of juvenile vegetation away from water,
- Vegetation overhanging or dense strands near water to be cut and pasted, drilled or manually removed (depending on access and density).

Native low growing species will be encouraged to establish throughout the scheme rather than larger trees or weed species. Planting or the spread of woody species, native or exotic, near or on scheme assets may compromise the integrity of that asset.

In addition to the vegetation management discussed above, WRC staff have also had discussions with the Department of Conservation and the Advocates for the Tongariro River relating to the potential for control of pockets or isolated wilding pines in the riverbed upstream of Turangi (from the SH1 bridge to prison and more specifically, above the Hydro Pool). Control methods proposed are the same as detailed above. Consultation on the potential control of wilding pines/other species of interest in this reach of the river is also invited.



Figure 3: Example of manually removed vegetation at the toe of the Grace Rd to SH1 Bridge Stop Bank with the invasive vegetation on the flood plain behind spot sprayed.

Consented Activities

Channel Stability / Flood Management

Lower Tongariro, large island adjacent to Kohineheke Reserve

Community feedback has highlighted concern for accelerated erosion along the true left bank and increased flooding along the true right during high flow events. These continuing issues are increasingly concerning and reflect the necessity to progress solutions. These concerns are supported by our most recent scheme review and ongoing observations by WRC staff.

These issues are largely due to gravel build up in this reach. Lowering of built-up areas of the island is required so that the flood scheme assets can hold a 1 in 100yr flood event. It is estimated that between 40,000-60,000 cubic metres of gravel needs to be removed from this area to achieve this.

As noted above, this work will unlikely occur in the 2022/23 year and is more likely to be planned this year to undertake physical work in 2023/24 year. This is due to the engagement and resourcing required for this component of the work, including uncertainties about where to dump excavated material.

Concerns raised during previous consultation include changes to the hydrology of this reach and potential impacts on the fishery and ecosystem. The plan below addresses these concerns while maintaining the objective.

The focus is to remove gravel from the built areas down to annual average flow level (Figure 4), leaving a buffer strip undisturbed. This will increase water holding capacity, without affecting the hydrology of the wet river channels and reduce the potential for sediment release. Machines and trucks will enter the island by a causeway over the true right channel to avoid river crossings reducing potential of sediment discharge. The piped causeway will also allow fish passage and will be installed from the Grace Rd fishing access area and removed post works.



Figure 4: Island adjacent Kohineheke Reserve. Grey: Built up areas requiring lowering to annual average flow level.

Emergency Works

Emergency work may be undertaken in accordance with Section 330 of the Resource Management Act 1991 in response to a sudden event causing or likely to cause loss of life, injury, or serious damage to property or the environment. Emergency works are not subject to the provisions of these consents (RC 121306, 121305).

In the case of an emergency (such as imminent flooding) every effort will be taken to notify representatives from the concerned parties in accordance with the internal protocol developed for when Section 330 RMA is invoked.

It is important that we continue to make timely decisions and undertake ongoing maintenance as provided for by consents (RC 121306, 121305) to reduce the need for emergency works.

Timing of Works

The Tongariro River hosts a range of indigenous fish species and is a nationally significant trout fishery. As such the timing of **in-stream** works are limited to the months outside of May to October. This ensures work falls outside of the main trout and indigenous fish spawning season.

Although trout fishing is popular all year, fishing activity generally falls over the warmer summer months. For this reason, works will be scheduled for middle summer. This will also coincide with low flows. Representatives from DoC will be consulted at various stages prior to the works commencing to ensure the best possible outcomes in the event of late spawning runs or other such natural events. Continued Whio (blue duck) population increase gives rise to an appreciation for nesting timing and known nesting sites. Continued consultation with DoC and local experts will be maintained to minimise any disturbance.

Monitoring and Mitigation

To perform best practice and adhere to consent conditions (referenced in brackets) the following mitigation strategies will be implemented at each work site:

- Site notices will be erected five days prior to works (c 7)
- Public access will not be unduly restricted (c 8)
- Hours of operation are restricted to Mon-Sat, 8am-6pm max. (c 11)
- Machinery will be cleaned prior to entering work sites (c 14)
- Machinery will be operated in accordance with best practice (c 17)
- A spill prevention plan will be identified and addressed (c 18-20)
- Best practice for sediment control will be applied (c 22-30)
- Notification and work plans will be circulated (c 37-39)

Other mitigation strategies include:

- Threatened species and archaeological remains discovery processes will be discussed before each job site commences work.
- Mitigation and enhancement measures for fish habitat will be discussed and implemented where possible.

Consent Compliance Monitoring

A resource consent compliance monitoring regime has been developed in consultation with the Resource Use Directorate (RUD). The ICM Environmental Compliance team will be implementing this process.

All relevant resource consent conditions will be monitored and assessed. A Compliance Audit Report will be drafted and reviewed by RUD prior to approval. This report will identify any areas of non-compliance and identify any remedial actions undertaken to rectify this non-compliance.

A representative number of sites will be selected for monitoring, based on the scale, location and sensitivity of the proposed sites.

Hazardous Substance Spillages

All machinery will be refuelled, serviced and maintained in manner to ensure spillages of contaminants are prevented, and in a location that, should a spill occur, it will not enter a waterway.

Spill prevention and response activities will be undertaken in accordance with ICM's Oil Spill Contingency Guidelines.

In addition, a contingency plan will be submitted to ensure:

- Equipment on site can deal with a containment spill,
- Procedures are in place in the event of a containment spill,
- Interested and affected parties are notifiable,
- Refuelling locations and fuel storage areas are clearly identified.

Dust

Should dust become an issue which may result in an objectionable or offensive effect beyond the work site boundary, works shall cease until appropriate dust suppression measures are put in place. These measures may include the use of water carts or irrigation on the exposed areas and slowing or minimising vehicle movement.

Threatened species discovery protocol

In the event that a species listed as “threatened” is discovered at a works site, the following process shall occur:

- All works at the site shall cease immediately.
- Notify the ICM Environmental Compliance team (Senior Environmental Officer or Environmental Officer – in their absence notify the Team Leader Regional Hazards and Environmental Compliance or Manager Business and Technical Services) as soon as practicable following the discovery.
- Within 24 hours of the discovery, the ICM Environmental Officer (or delegate) shall inform the RUD and the Department of Conservation.
- Works shall only re-commence once approval has been obtained by RUD following their consultation with the Department of Conservation.

Fish Habitat

Trout breed in low gradient gravel-bottomed streams between late winter and early spring. The brown trout peak spawning period is slightly earlier than that for rainbow trout but both spawning periods are encompassed within the instream works restriction period under the Waikato Regional Plan section 4.2.21.

In stream works have the potential to impact on trout and indigenous fish populations through habitat disturbance, habitat loss and decreases in water quality. Works highlighted in this programme are expected to have minimal effect on fish habitat. However, DoC and local fishing authorities will be consulted on preferred habitat and population distribution to further reduce any potential effects.

ACTIVITY TYPE	MITIGATION HIERARCHY			
	Avoidance	Minimisation	Rehabilitation	Offset
Woody vegetation removal	Adhere to appropriate timing restrictions.	Minimise disturbance of -wetter channel -riffle & boulder/pool habitat -instream structures -backwaters/side channels Undertake work at a permitted activity level wherever possible.	Encourage and advise on riparian enhancement	Encourage and advise on riparian enhancement
Channel Stability/ Gravel	Adhere to appropriate timing restrictions.	Minimise disturbance of -wetter channel -riffle & boulder/pool habitat	Where applicable apply methods to improve trout habitat.	

ACTIVITY TYPE	MITIGATION HIERARCHY			
	Avoidance	Minimisation	Rehabilitation	Offset
Management/Blockage Removal		<p>-instream structures -backwaters/side channels</p> <p>Install a temporary causeway with culverts to minimise disturbance to the wetted channel.</p>		

Table 1 *Green* measures will be implemented when value is known to be present; *Red* measures will be implemented at the discretion of operational staff; *Blue* measures will be implemented through Habitat Enhancement Plans or predetermined mitigation packages.

Fishing and Recreational Access

Access to fishing and recreational activities will be retained wherever possible. Access will only be restricted to work sites during hours of operation, and only to the area where work is being carried out to ensure public safety.

Archaeological / Culturally significant discovery process

In the event that archaeological remains are discovered at the works site, the following process shall occur (in accordance with condition 40) and the ICM Accidental Archaeological Discovery Protocol.

The following procedure **must** be followed by the person responsible for the site (e.g. the ICM Works Supervisor/Project Manager/Contractor):

- Immediately cease all earth moving work and shut down earth disturbing machinery within 10 metres of any part of the discovery. Stay away from the area to avoid any further disturbance.
- Secure the immediate vicinity of the discovery to restrict access and ensure remains are left undisturbed (e.g. by installing a temporary mesh fence).
- As soon as practicable, and within six hours of the discovery, inform:
 - The Director and/or a Section Manager of the ICM Directorate;
 - The ICM Environmental Compliance team.

Provide them with as much information as possible about the site and what has been uncovered or found on the site.

- As soon as practicable, and within 24 hours of the discovery, ICM shall inform:
 - The appropriate Mana Whenua representative;
 - The Director and/or a Section Manager of RUD;
 - Heritage New Zealand – infonorthern@heritage.org.nz, 09 307 9920;
 - The relevant Territorial Authority;
 - NZ Police if the discovery is of potential human remains.
- ICM shall assist with any investigation as required and proffer a site inspection for initial assessment and response with RUD and all other parties that have expressed an interest in attending.

- If the accidental discovery is of potential human remains the remainder of the process does not apply until the NZ Police confirm they have no further interest.
- Following the site inspection and consultation between all parties, RUD and Heritage NZ will determine the statutory requirements and Mana Whenua will determine cultural requirements.
- Works may only recommence within the area of the discovery upon the written approval of the Resource Use Directorate, after considering the following matters:
 - Mana Whenua interests and values;
 - Protocols agreed upon by Mana Whenua and ICM;
 - ICM's interests;
 - Any Heritage New Zealand authorisations;
 - Any archaeological or scientific evidence; and
 - The assessment of the discovery by a registered archaeologist.

Appendix 1: Resource consent conditions

Resource Consent Numbers 121305 and 121306

1. The activities authorised by this consent shall be undertaken in general accordance with the documents titled "*Land Use & Water Resource Consent Application and Assessment of Environmental Effects for the Tongariro River Gravel Management - Revised October 2010*", Sherie McHardy, Taupo Planning Consultant & Design Services except as otherwise identified in the following resource consent conditions.
2. A copy of this resource consent shall be kept onsite at all times that physical works authorised by this consent are being undertaken and shall be produced without unreasonable delay upon request from a servant or agent of the Waikato Regional Council.
3. The Consent Holder shall notify the Waikato Regional Council in writing of the commencement of activities authorised by this consent, at least 5 days prior to discrete sections of work authorised by this consent commencing.
4. The Consent Holder shall appoint a representative(s) prior to the exercise of this resource consent, who shall be the Waikato Regional Council's principal contact person(s) in regard to matters relating to this resource consent. The Consent Holder shall inform the Waikato Regional Council of the representative's name and how they can be contacted at least 1 working day prior to the commencement of the works authorised by this resource consent. Should the representative(s) change during the term of this resource consent, the Consent Holder shall immediately inform the Waikato Regional Council and shall also give written notice to the Waikato Regional Council of the new representative's name and contact details.
5. The Consent Holder shall arrange and conduct a pre-works site meeting each year that works are proposed and invite, with a minimum of 10 working days notice, the parties listed in condition 38, the Waikato Regional Council Resource Use Group, the site representative(s) appointed under condition 4 of this consent, the contractor if known, and any other party representing the consent holder, prior to commencing the consultative phase of each Proposed Annual Works Programme detailed in condition 37 below.

Advice Note: *In the case that any of the invited parties, other than the site representative does not attend this meeting, the consent holder will have complied with this condition, provided the invitation requirement is met.*

6. The Consent Holder shall be responsible for all contracted operations related to the exercise of this resource consent, and shall ensure contractors are made aware of the conditions of this resource consent relevant to their work area, and comply with those conditions.

Notices

7. The Consent Holder shall erect and maintain notices upstream and downstream of each section of the works not less than 5 working days prior to the commencement of the works. These notices shall provide appropriate warning of:
 - a) the proposed works;
 - b) any relevant safety advice;
 - c) the period over which these works will be occurring.

Access to Tongariro River

8. The Consent Holder shall, in respect of the works authorised by this resource consent, maintain any existing public access at any location where works authorised by this consent are carried out except where the public are required to be excluded for safety purposes. In the latter situation, every effort must be made to ensure that through or by-pass access to up or down river locations is either available or provided.

Timing of works

9. Works authorised by this consent shall not be undertaken in the wet river channel during the months May to October inclusive each year, except where:
 - a) flood flows have resulted in stopbank freeboard loss and the remaining freeboard in the reach upstream of the bridge being less than 150mm and/or the remaining freeboard in the reach downstream of the bridge being less than 400mm; or,
 - b) there is a reduction in a cross sectional area which is more than the product of 0.30 times the design width at the design flood level, or
 - c) erosion control works to maintain the integrity of the Tongariro River Flood Control Scheme are required.
10. The Consent Holder shall provide survey information to the Waikato Regional Council confirming the trigger levels set in 9a or 9b above have been met prior to undertaking works provided by condition 9.
11. Works may be undertaken up to a maximum of 10 hours per day during the period 8am to 6pm; and, up to six days per week Monday to Saturday. No works shall be undertaken on a Sunday or a Public Holiday.
12. The Department of Conservation shall be notified prior to any works occurring during the months of May to October.
13. The Consent Holder shall check daily and weekly weather forecasts. In the event of a rain forecast which could result in flood flows which may, in conjunction with undertaking the works authorised by this consent, adversely affect the Tongariro River environment, the works shall be postponed, or be suspended if already commenced, and all machinery shall be removed from the river bed and flood plain until the identified flood risk has passed.

Machinery maintenance and hazardous substances spill prevention and response plan

14. The Consent Holder shall ensure that all machinery used in the exercising of this consent is cleaned prior to being transported to the construction site to ensure that all seed and/or plant matter has been removed.
15. All machinery, including bulldozers, loaders, diggers and trucks, shall be operated in a manner so as to minimise time spent in flowing water.
16. No river-bed material extraction shall be undertaken in flowing water.
17. The Consent Holder shall ensure that all machinery shall be maintained and operated in a manner which ensures that spillages of fuel, oil and similar contaminants are prevented. Particular care shall be taken during refuelling and machinery servicing and maintenance. Such activities shall be carried out away from any water body and in such a manner that any spillage can be contained so it does not enter the Tongariro River.

18. The Consent Holder shall provide the Waikato Regional Council with a “Spill Prevention and Response Plan” at least 20 working days prior to the commencement of activities authorised by this consent. This Plan shall be submitted to the Waikato Regional Council for their written approval, acting in a technical certification capacity. The aim of the Plan shall be to minimise the possibility of contamination of water. This Plan shall address, but not necessarily be limited to, the following matters:
- a) a list of the hazardous materials and their quantities kept on site and their storage details;
 - b) the prevention measures that will be undertaken on site in order to avoid a spill of hazardous materials;
 - c) the equipment available to contain and/or remove spills of hazardous materials;
 - d) specific procedures and measures that will be undertaken when machinery is operating within close proximity to water bodies that are designed to minimise the risk of any spillages or significant leakages of hazardous materials entering the water body;
 - e) the training staff will receive in the use of hazardous materials spill prevention, containment and clean up measures and associated equipment;
 - f) how the disposal of any contaminated materials arising from spills or leakages of hazardous materials will be undertaken; and,
 - g) the procedures involved in reporting of any such incidents to the Waikato Regional Council.
19. The Consent Holder shall in exercising this consent comply with the approved “Spill Prevention and Response Plan”. Any subsequent changes to the “Spill Prevention and Response Plan” shall only be made with the prior written approval of the Waikato Regional Council, acting in a technical certification capacity.
20. The Consent Holder shall notify the Waikato Regional Council and the Department of Conservation as soon as is practicable, and as a minimum requirement within 12 hours, of the Consent Holder becoming aware of a spill of hazardous materials, fuel, oil, hydraulic fluid or other similar contaminants. The Consent Holder shall, within 7 days of the incident occurring, provide a written report to the Waikato Regional Council, identifying the following:
- a) the possible causes;
 - b) steps undertaken to remedy the effects of the incident; and,
 - c) any additional measures that will be undertaken to avoid future spills.

Responsibility for erosion control works

21. The Consent Holder shall be responsible for the provision and maintenance of any erosion control works that may be necessary as a result of the exercise of this resource consent.

Sediment control and debris removal

22. The Consent Holder shall ensure that sediment losses to natural water arising from the exercise of this resource consent are minimised for the duration of the works and during the term of this consent.
23. Stormwater runoff from the river-bed material extraction area access road shall be controlled to such an extent that it is discharged into the ground and not discharged directly into the Tongariro River.
24. River-bed material shall only be removed below the adjacent River water level when the excavation site is bunded from direct surface connection with the River.

25. Excavations below water level shall be backfilled to a level not deeper than 1m below the adjacent river channel water level using river bed material from within the site. Inlet and outlet channels shall be provided to a depth similar to that of the completed backfilled area to maximise continuous river flows through the site. A minimum buffer of 10m from the undisturbed river channels shall be left intact.
26. Debris collected during river-bed material extraction shall be removed from the river bed and the floodplain of the river.
27. Should the works authorised by this consent cause a conspicuous change in the visual clarity of the river after a mixing distance of 100 metres downstream from the activity, then the consent holder or its delegate shall measure the concentration of suspended solids in the river at this location and upstream from the activity and provide those measurements to the Waikato Regional Council within 10 working days.
28. The activities authorised by this consent shall not result in any of the following standards in the Tongariro River being breached after reasonable mixing and at a point 100m downstream of the works:
 - a) black disc horizontal visibility less than 1.6 metres;
 - b) a conspicuous change in the visual clarity of the river;
 - c) An increase in the concentration of suspended solids above 25g/m^3 after a mixing distance of 100 metres downstream from the activity except when the concentration of suspended solids in the Tongariro River above the work site is greater than 25g/m^3 . Then there shall not be any increase in the Tongariro River suspended solids concentration as a result of the activity.

Flow diversion and re-contouring

29. The Consent Holder shall, immediately after the construction of each temporary diversion bund either maintain fish passage past the bund or, in conjunction with the Department of Conservation, salvage any fish stranded in pools in the diverted section of river channel and return them to the main channel of the Tongariro River.
30. Except as provided for by conditions 24-25, on completion of river-bed material extraction at any one location, the Consent Holder shall re-contour the surface of the extraction area back to its original form, to the satisfaction of an officer of the Waikato Regional Council's Resource Use Group.

Erosion control structures

31. Structures and floodways in the immediate vicinity of structures shall be maintained clear of debris.
32. Structures shall not decrease the cross sectional area of the river.
33. All construction materials and equipment shall be removed from the river upon completion of the activity.
34. Where the weight of the structure is insufficient to keep it in place it shall be permanently anchored to the bed of the river.
35. All structures shall be maintained in a structurally sound condition at all times.

Dust emissions

36. All activities undertaken on site shall be conducted and managed in a manner that ensures that all dust emissions are kept to a practicable minimum. To this end there shall be no discharge of dust as a result of the activities authorised by this consent that causes an objectionable or offensive effect beyond the boundary of the property on which works are authorised by this consent.

Proposed annual works programme

37. The Consent Holder shall prepare a Proposed Annual Works Programme including (but not limited to) the following:
- a) details of scheduled works and maintenance requirements authorised by this consent that are to be carried out for the 12 months commencing 1 November including a description of the nature, scale and location of the works; and
 - b) the proposed timing of the works; and
 - c) any contingency procedures that may be required for specific activities; and
 - d) any specific mitigation measures that will be undertaken; and
 - e) riparian planting proposed using eco-sourced indigenous plants;

Any changes to the Proposed Annual Works Programme (with the exception of works required to be undertaken without delay, for example, unscheduled works in response to flood events) shall be advised in writing by the Consent Holder to the Waikato Regional Council within 10 working days of the work commencing.

38. The Consent Holder shall distribute the Proposed Annual Works Programme required by condition 37, to the following parties on or before 30 June each year requesting comment(s) on the proposed works (if any) to be provided in writing within 20 working days of receipt:
- a) Department of Conservation;
 - b) Tongariro and Lake Taupo Anglers Club Inc.;
 - c) Advocates for the Tongariro River;
 - d) Taupo Fishery Advisory Committee via DOC;
 - e) Tuwharetoa Maori Trust Board; and
 - f) Ngati Turangitukua,
 - g) Genesis Energy; and,
 - h) Waipapa and Tokaanu Maori Lands Trust.

Comments received by the Consent Holder from the above parties regarding the proposed works shall be copied to the Waikato Regional Council. Any changes to the Proposed Annual Works Programme (with the exception of works required to be undertaken without delay, for example, unscheduled works in response to flood events) shall be advised in writing to the groups listed in this condition.

39. The Consent Holder shall address any comments from the parties listed in condition 38, and upon completion of any related changes to the Proposed Annual Works Programme, advise these parties in writing of any changes. The Consent Holder shall submit the Proposed Annual Works Programme to the Waikato Regional Council prior to 1 October annually. The Consent Holder shall not commence these works until the Proposed Annual Works Programme has been approved by the Waikato Regional Council acting in a technical certification capacity.

Tangata whenua values

40. In the event that any archaeological remains are discovered, the works shall cease immediately in the vicinity of the discovery, and Tangata Whenua, the Historic Places Trust and the Waikato Regional Council shall be notified as soon as practicable and within 48 hours of a discovery. Works may recommence with the written approval of the Waikato Regional Council. Such approval shall only be given after the Waikato Regional Council has considered:
- a) Tangata Whenua interests and values,
 - b) the Consent Holder's interests,
 - c) Historic Places Trust advice, and
 - d) any archaeological or scientific evidence.

Review

41. During the April to June period each year for the term of this consent Waikato Regional Council Resource Use Group may, following service of notice on the Consent Holder, commence a review of this consent under section 128(1) of the Resource Management Act 1991, for the following purposes:
- a) To review the effectiveness of the conditions of this resource consent in avoiding or mitigating any adverse effects on the environment from the exercise of this resource consent and if necessary to avoid, remedy or mitigate such effects by way of further or amended conditions; or
 - b) To review the adequacy of and the necessity for monitoring undertaken by the Consent Holder and specifically to review the method and frequency of record collection for the purposes of determining the most appropriate method and frequency; or
 - c) If necessary and appropriate, to require the holder of this resource consent to adopt the best practicable option to remove or reduce adverse effects on the environment.

Administration

42. The Consent Holder shall pay to the Waikato Regional Council any administrative charge fixed in accordance with section 36 of the Resource Management Act 1991, or any charge prescribed in accordance with regulations made under section 360 of the Resource Management Act.