Tongariro River
Flood Protection Scheme

Proposed
Annual Works Programme
2024/2025

updated 27 June 2024

Contents

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 1km upstream of the state highway 1 bridge at Turangi. An average flow is between 20 and 25m^3/s. Four distinct freshes occurred during the last 12 months having peak flows between 295 and 415m^3/s and the previous highest flow being 508m^3/s in January 2023. Two extreme floods (recorded in 1958 and 2004) both exceeded 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 (Sand and Silt) carried past Turangi each year, depositing in the river's delta or contributing to sediment within Taupo. Continued monitoring and maintenance of the flood protection assets, the floodway and main channels is required to ensure the scheme operates to design standards.

An 'asset condition assessment' has been undertaken within the last 12 months to assess the condition of all flood protection assets (including an aerial inspection). The 'asset condition assessment' provides the basis for the proposed 2024/25 Annual Work Programme, which this year targets vegetation control in key locations.

The requirement for gravel extraction within the riverbed will be re-considered following planned cross section surveying and subsequent modelling of floodway adequacy.

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.

Resource Consent No.	**Activity authorized**
121305	Erosion control/flood protection works: gravel extraction up to 150,000m^3/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.

Resource consent conditions 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).

Council Staff are available to meet with any party to discuss any issues or concerns relating to the proposed work.

The purpose of this AWP is to:

- Highlight proposed works, limited this year to nuisance vegetation control at key sites
- Outline how the proposed work 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.
- Provide a basis for seeking the written permission from all relevant landowners on whose land work is proposed to be undertaken.

Tongariro Flood Protection Scheme Assets

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.

The location of the primary flood protection scheme assets are shown in Figure 1.

Figure 1: Tongariro River Flood Control Scheme

2024-2025 Works Programme

General Maintenance

Includes, managing emerging invasive vegetation on 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.

Scheme Survey

See Appendix 1:

The assets require regular inspection to monitor their condition. Furthermore, the condition of the river channel and floodplain must be monitored. This involves periodically surveying the river channel, floodplain, and stopbanks. This information is required to identify erosion, the need for basic maintenance on assets, and to allow modelling of the performance of the entire scheme under future flood events.

The extent of the survey covers the floodbank and floodwall crests, and a series of transects across the floodplain and riverbed (approximately perpendicular to the main channel).

Survey will require access to areas of the floodplain that may not have been visited in the last nine years. Significant vegetation growth has occurred during this period, and some locations will be inaccessible. Vegetation clearance will be required to complete the works, we expect that most of the plants to be removed will be fast growing, invasive weed species, however it is likely that some native plants will be also affected. Areas of the floodbank have been planted (it is assumed that this work was undertaken by community groups unaware of the requirements/operational demands of the structure). This compromises the durability of the structure and must be removed. In some cases, this also limits access to undertake survey works, clearance of these trees (including a significant amount of Manuka) will be undertaken prior to survey.

Procedures to undertake these works have been developed to minimise the necessary impacts upon the vegetation:

- The approximate location of each transect will match those undertaken previously, however there is provision to modify the alignment to avoid inaccessible areas.
- The team will be equipped with 5m tall GPS survey equipment to allow visibility over low vegetation.
- If clearance is required, where practical, clearance will be limited to pruning with loppers by the survey team during works. Some zones of heavy weed infestation (blackberry, etc.) may require separate contractors utilising scrub bars, or spraying with glyphosate prior to survey works.

Nuisance Vegetation Management

See Appendix 2:

Nuisance vegetation growth throughout the floodway may affect the river in a number of ways relating to flood protection, including;

- Restricting the rivers natural functions.
- Promoting an unnatural rate of gravel and sediment aggradation.
- Decreasing flood scheme capacity and increasing channel instability.

Target species predominantly include, but are not limited to, Willow, Broom, Wildling Pine, Buddleia. The target areas for this works season are identified within Appendix 1.

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, (knapsack spraying)
- Vegetation overhanging or dense strands near water to be cut and pasted, drilled and filled or manually removed (depending on access and density).

Due to the size and growth of some of the plants present

- Gun spraying from ATV or ute.
- Aerial (remote controlled drone)

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.

Potential control of wilding pines/other species of interest in the riverbed upstream of Turangi (from the SH1 bridge to te prison and more specifically, above the Hydro Pool) is an ongoing matter for consultation with interested parties.

Floodgate access vegetation removal

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

Two culvert floodgates (70483 & 70484) situated on the SH1 Bridge to Te Aho Reserve Erosion Control Rock Wall section 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 may be mechanically mulched so that roots do not threaten the stability of the structure.

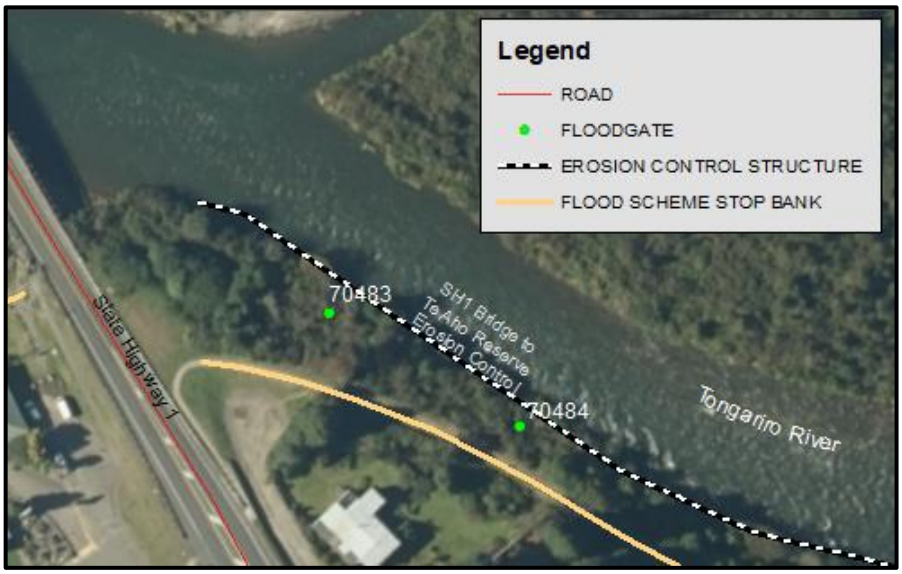


Figure 2: SH1 Bridge to Te Aho Reserve rock protection, Floodgate Flap Valves and stopbank location.

Hangarito Canal silt removal

The Catchment for this waterbody includes the significant erosion feature on the northern side of Pihanga in its headwaters, this ensures a regular and significant supply of sediment downstream.

The Hangarito Canal is an artificial watercourse, initially formed as a roadside ditch when state highway 41 was formed in the 1960s. This drain diverted the Hangarito Stream and other smaller tributaries from their previous location south of the highway alignment. In the early 2000s this was re-aligned to an outlet on the Tokaanu power station tailrace and enlarged by the Crown, to form a sizable channel with a sediment settling pond at its inlet. Despite the presence of the settling pond, a significant volume of silt continues to be deposited along the length of the canal. It has since become the responsibility of the regional council to maintain this asset.

To ensure ongoing drainage and avoid inundation of the surrounding land, it Is necessary to remove a significant volume of silt from the settling pond at regular intervals, and from the canal itself occasionally. The canal currently contains a significant volume of material. which will require removal this year. In addition to silt deposited within the Hangarito canal., a shoal has formed within the Tokaanu tailrace canal. Silt material will be removed from this point as part of the works.

The canal is included in the first stage of the planned survey works; this will inform the actual quantity of material to be removed. Whilst this material would naturally migrate to the lake, deposition into the lake is unlikely to be looked upon favourably by the community. Efforts are under way to identify a suitable destination for this material this year, and ongoing.

Timing of Works

The Tongariro River hosts a range of indigenous fish species and is a nationally significant trout fishery and the timing of work within the river bed is generally 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, any works expected to result in disturbance to the riverbed will be scheduled for mid to late summer. This usually also coincides with low flows. Representatives from DoC will be consulted 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 will be maintained to minimise any disturbance.

Any works requiring the use of herbicides will be scheduled for times when plants are most susceptible (generally spring and autumn). This allows minimal use of chemical, and best possible outcomes.

The Hangarito Canal has a perched outlet, this prevents trout access/spawning. It is not listed as an indigenous fishery within assessments recorded by Council. The main considerations with work in this location relate to sediment release into the Tokaanu tailrace. For this reason, works will be targeted to avoid high flows, with particular consideration given to any works within the downstream reaches of the canal.

Monitoring and Mitigation

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

- Site notices will be erected five days prior to works.
- Public access will not be unduly restricted.
- Hours of operation are restricted to Mon-Sat, 8am-6pm max.
- Machinery will be cleaned prior to entering work sites.
- Machinery will be operated in accordance with best practice.

Other mitigation strategies include:

- Threatened species processes will be considered before work commences at each site.

Consent Compliance Monitoring

All relevant resource consent conditions will be monitored and assessed. If required a compliance audit report will be prepared and identify any areas of non-compliance and any remedial actions undertaken to rectify this non-compliance.

A representative number of sites may 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 WRC's Oil Spill Contingency Guidelines and in addition, a contingency plan will be prepared 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.

Threatened species discovery protocol.

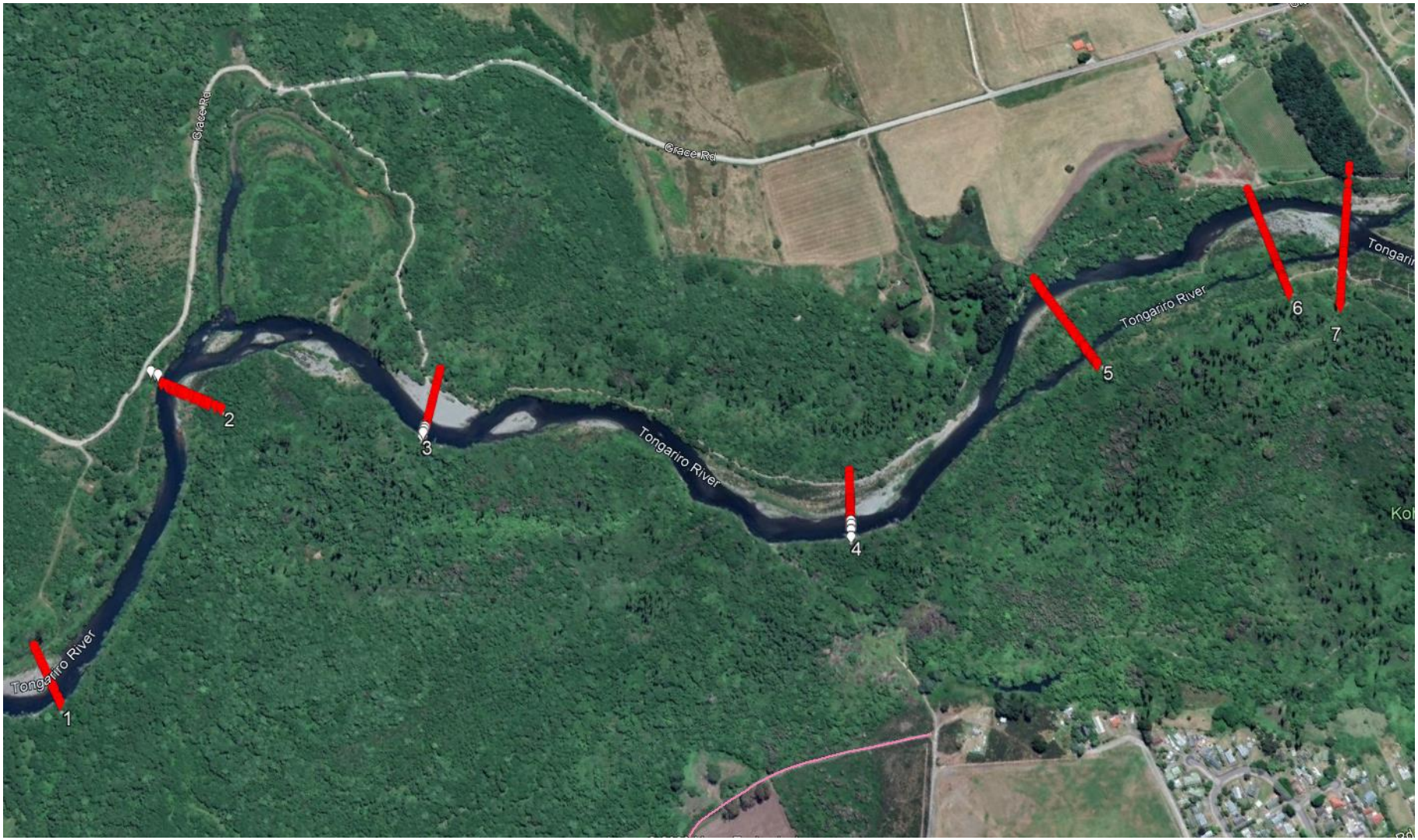
In the event that a species listed as "threatened" is discovered at a works site, the following process shall occur:

- All works at the site shall cease immediately.
- Notify the WRC 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 WRC Resource Use Directorate and the Department of Conservation.
- Works shall only re-commence once approval has been obtained by WRC Resource Use Directorate following their consultation with the Department of Conservation.

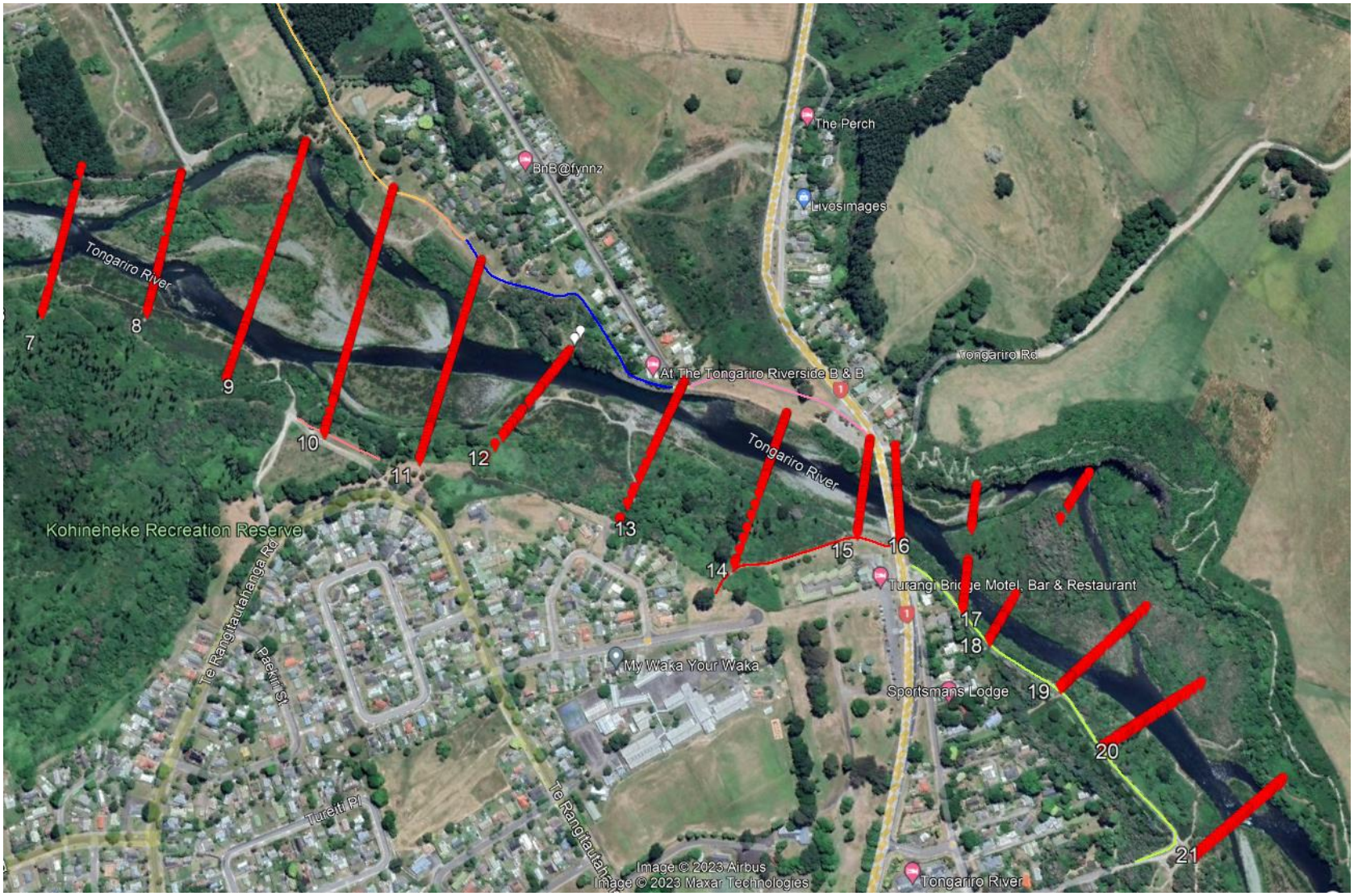
Fishing and Recreational Access

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.

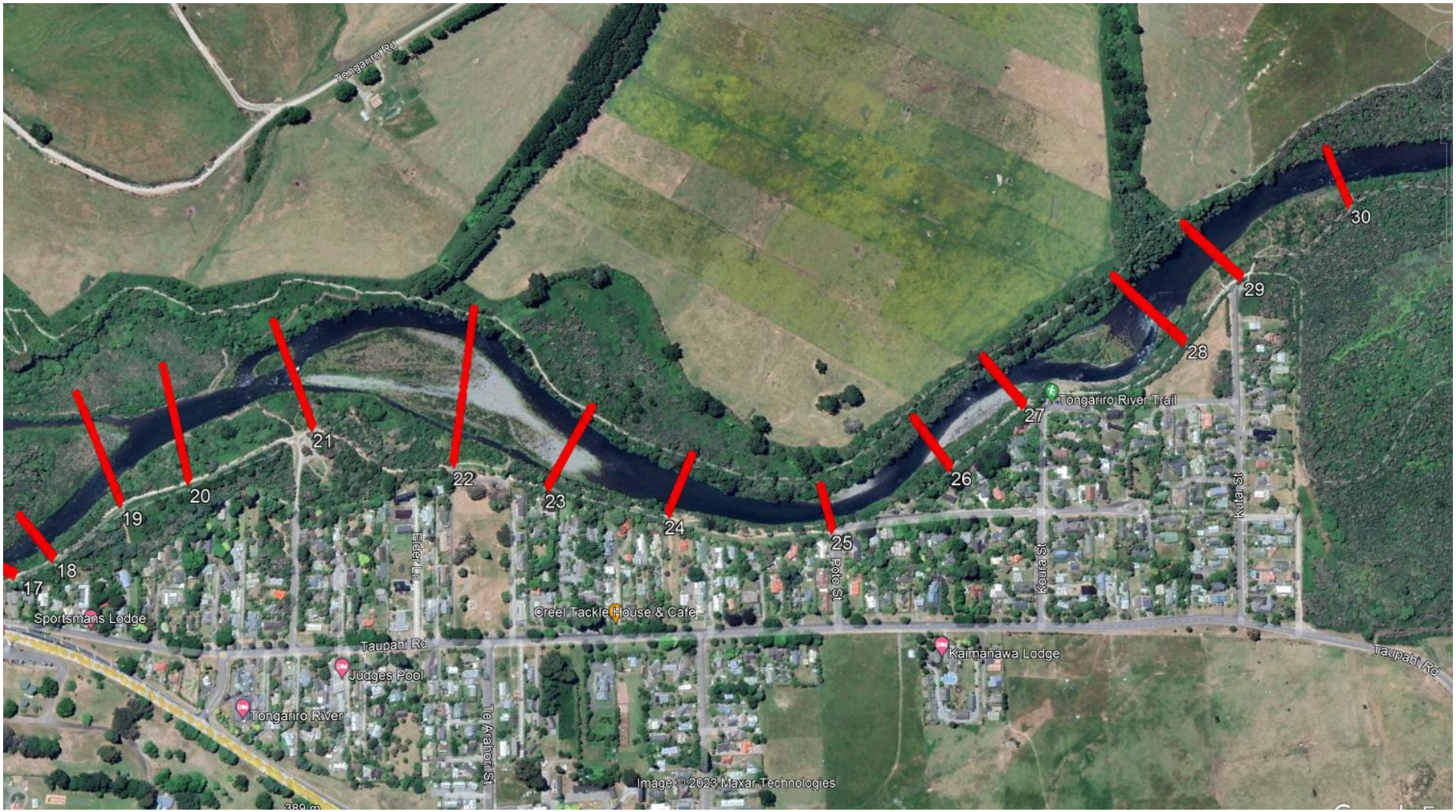
Appendix 1: Planned scheme survey locations



Downstream of SH1

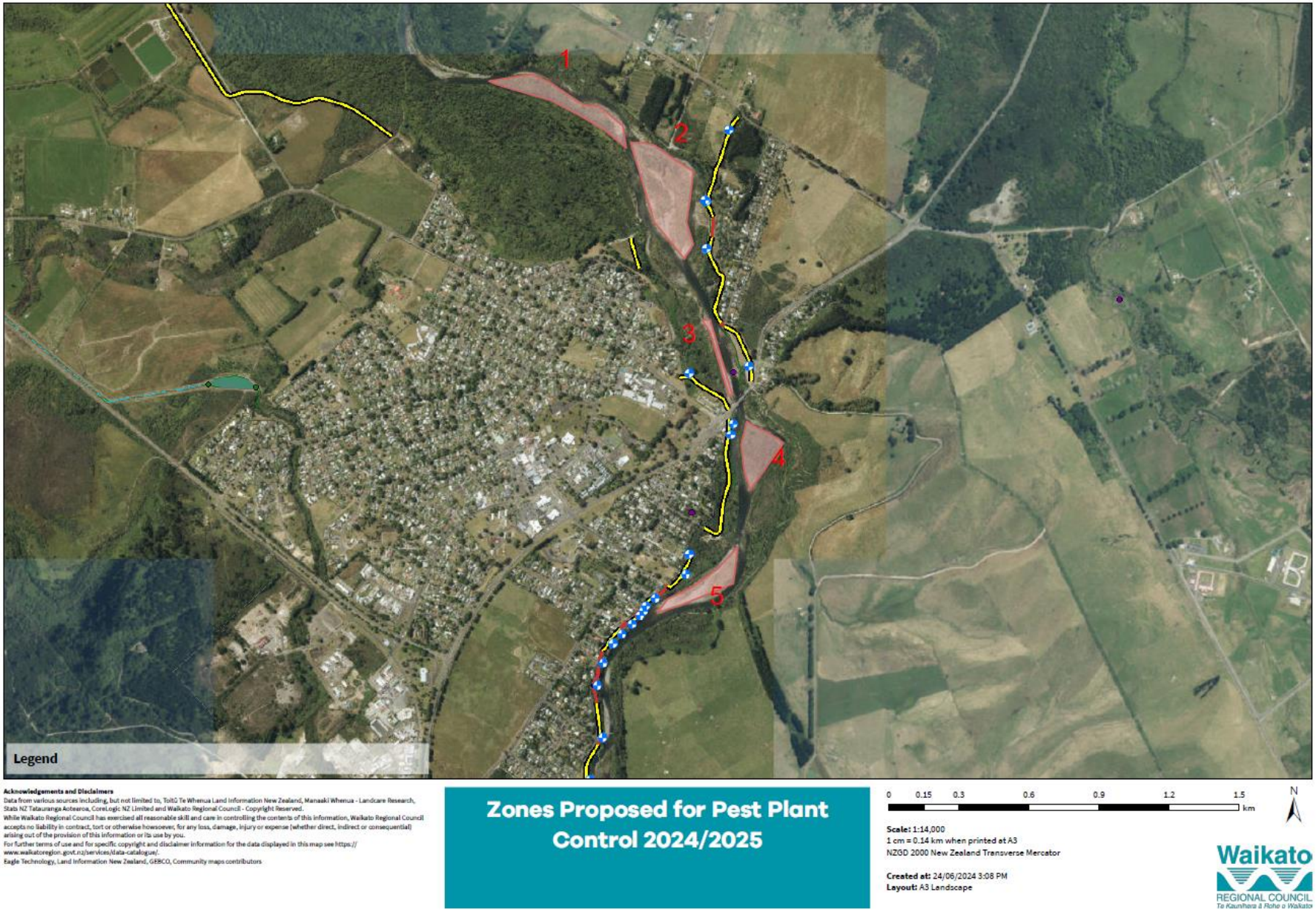


Upstream and Downstream of SH1

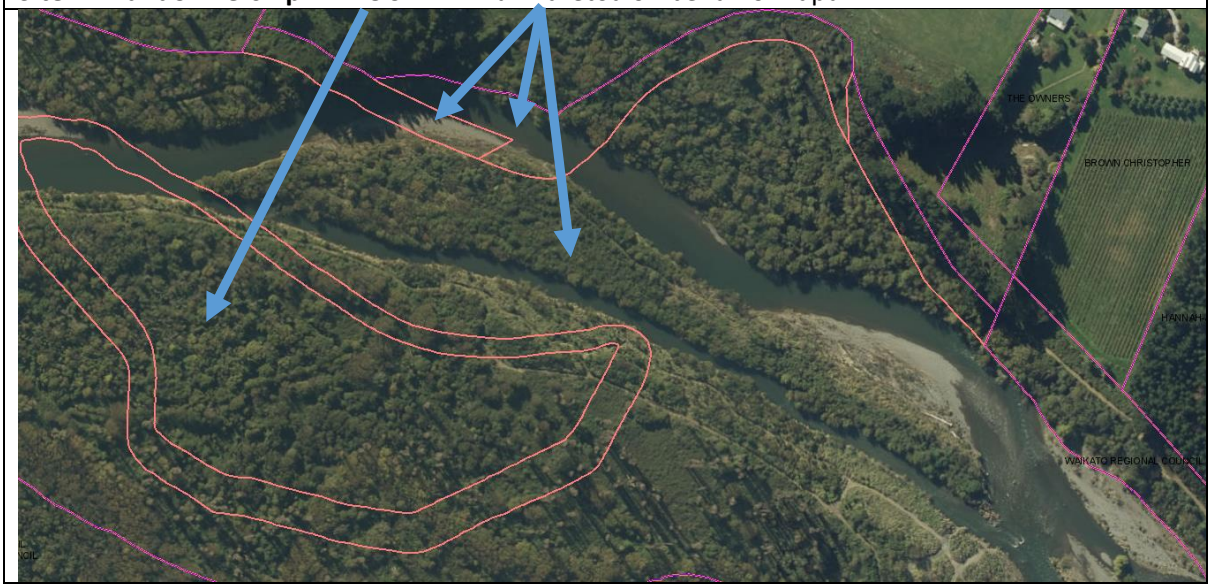


Upstream of SH1

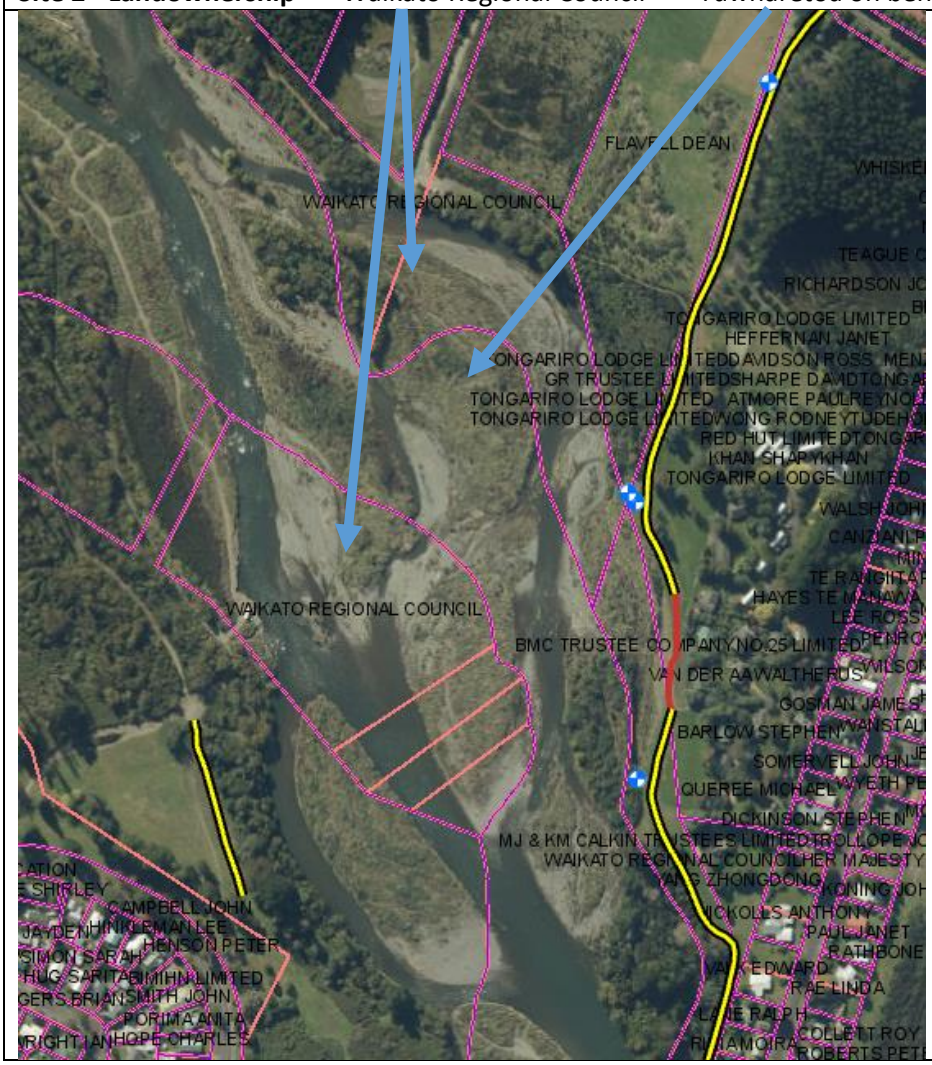
Appendix 2: Planned vegetation control sites



Site 1 – Landownership DOC Tuwharetoa on behalf of hapu

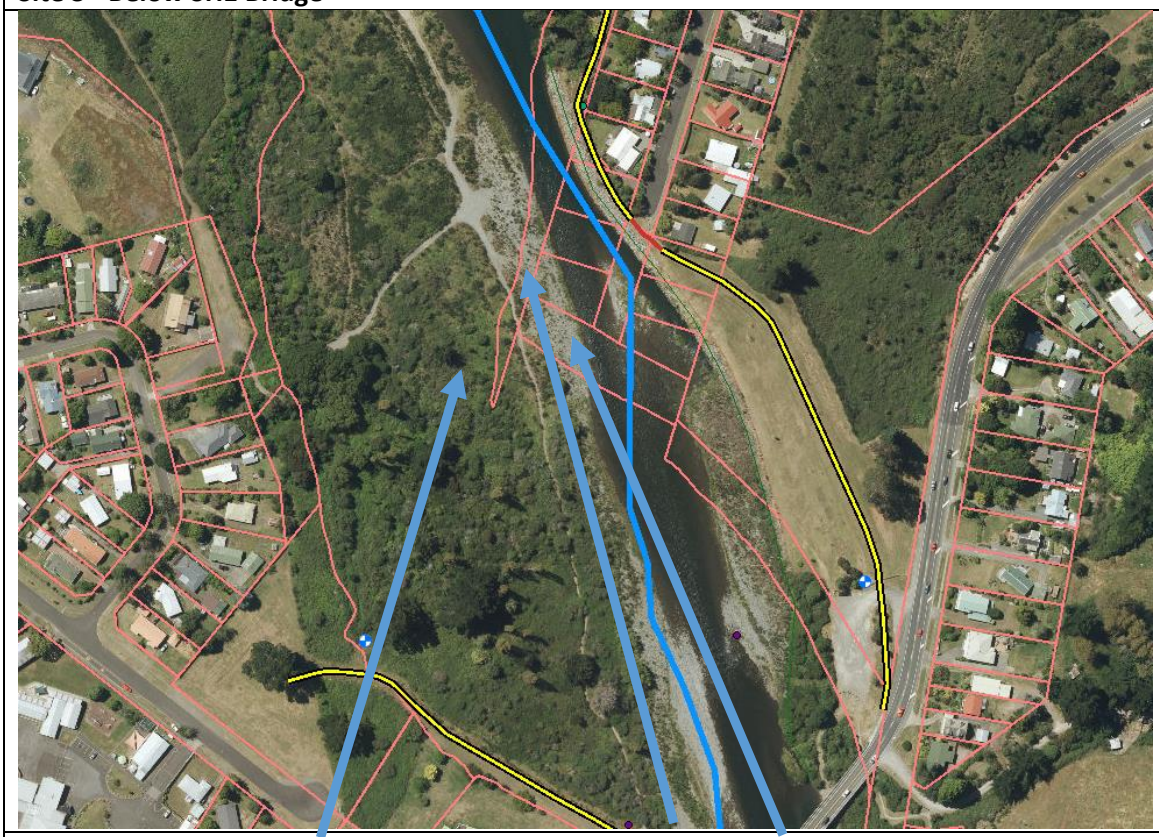


Site 2 - Landownership Waikato Regional Council Tuwharetoa on behalf of hapu



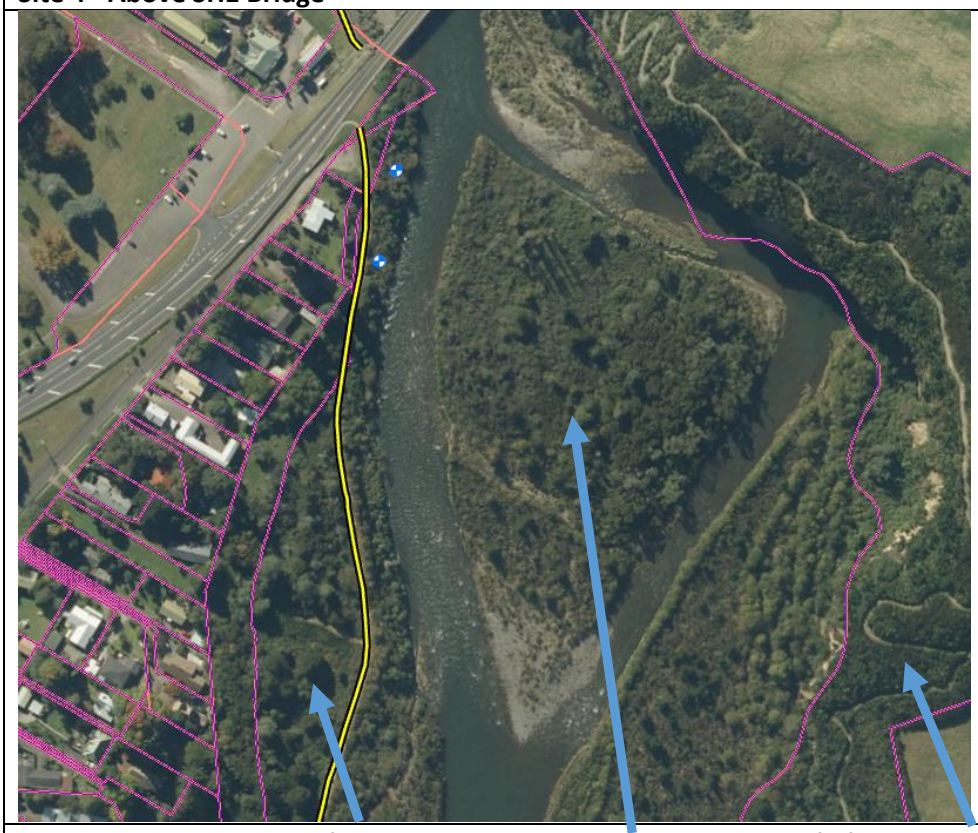
Appendix 2: Planned vegetation control sites

Site 3 - Below SH1 Bridge



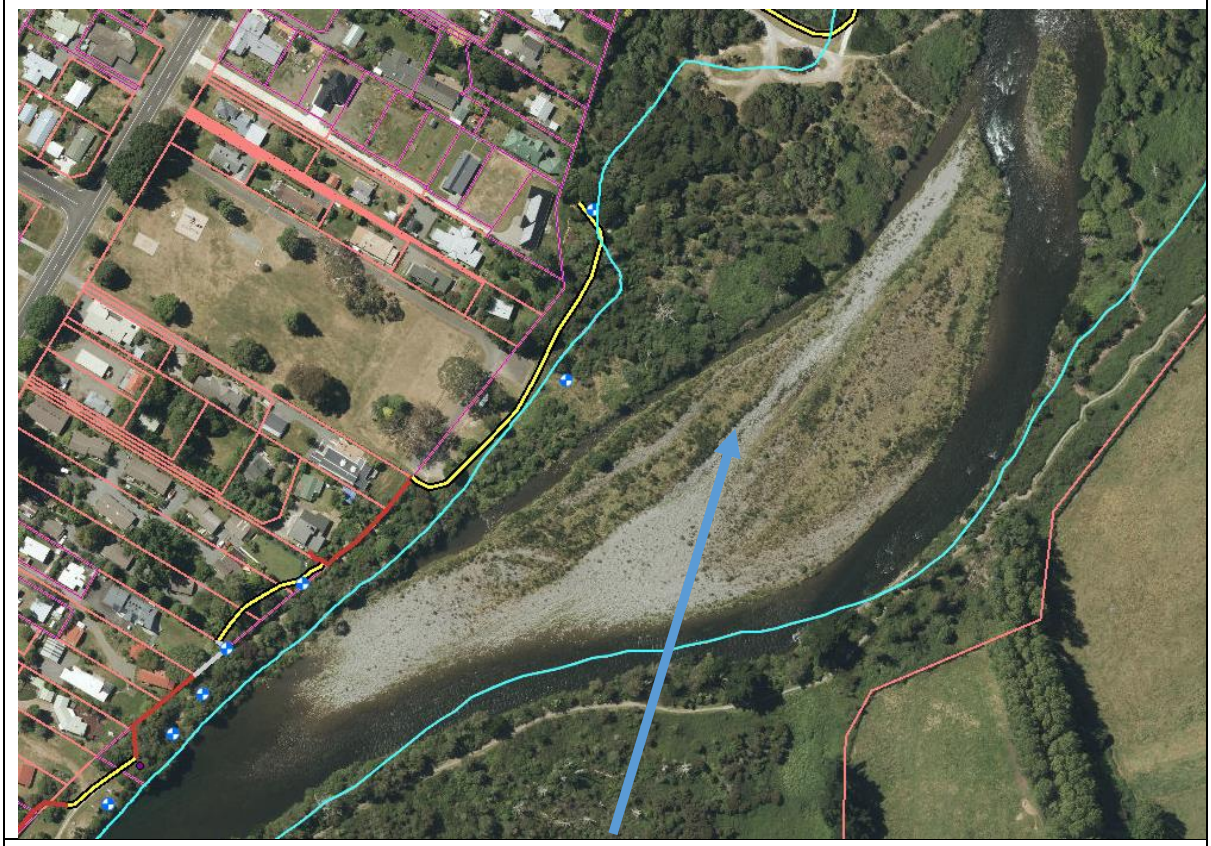
Landownership Tuwharetoa on behalf of hapu WRC DoC

Site 4 - Above SH1 Bridge



Landownership Dept of Conservation Tuwharetoa on behalf of hapu DoC

Appendix 2: Planned vegetation control sites

Site 5 - Above SH1 Bridge	
	
Landownership	Tuwharetoa on behalf of hapu