

**Statement of Evidence of
Ghassan Basheer
on behalf of
Waikato Regional Council
as submitter
Technical – Block 2
Proposed Plan Change 1 Hearing
18 June 2019**

Healthy environment

Strong economy

Vibrant communities.

Summary of Evidence

- Describe WRC's role in managing flood protection and drainage schemes
- A general overview of the LWWFCS and land drainage areas managed by WRC's ICMD
- Describe how the schemes infrastructure operates, and how PC1 might affect the operation of these scheme
- Comment on DOC rebuttal evidence to this submission
- Discuss the ability to manage contaminants sourced from land use activities

WRC's Role

- WRC – manages 75 flood protection and land drainage schemes within the Waikato and Waipa Rivers Catchments
- The schemes were constructed and are currently managed under several Acts, and consequent amendments (LDA, SCRCA, PWA, LGA, RMA, other relevant pieces of legislation and regulations)
- ICMD is the operational arm of WRC responsible for the delivery these services

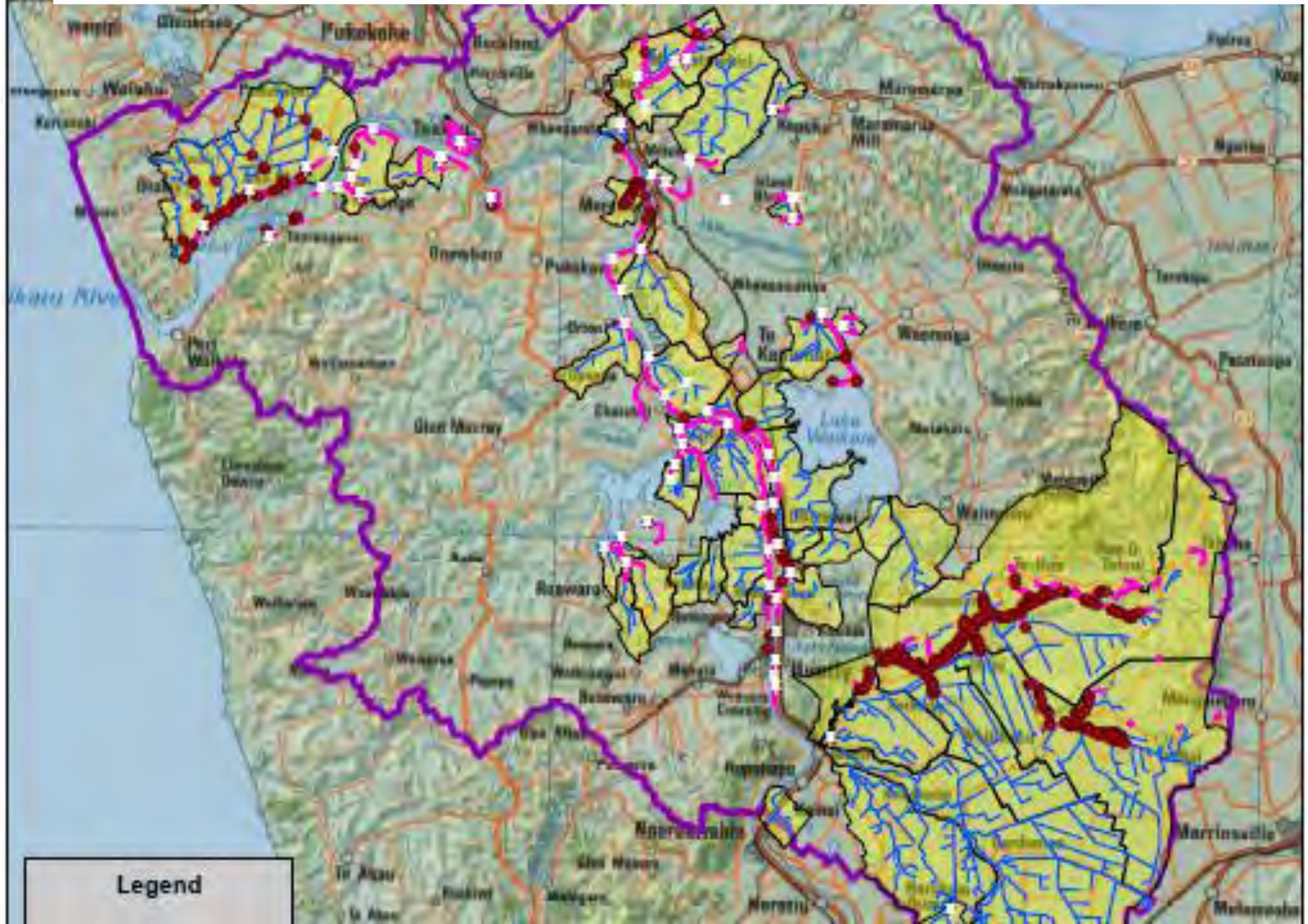
WRC Core Services

- Schemes aim at reducing flood risks, protecting economic productivity and contributing to wellbeing of the regional communities.
- Replacement value of assets \$585 Million.
- Strategic regional assets under LTP
- RAMP describes, schemes, assets, levels of service and requirements for sustainable management.
- Schemes are largely funded by targeted rates

LWWFCS

- A comprehensive river control scheme to address several issues.
- Considered a matter of national importance.
- Scheme designed in 6 sections covering 45,000 ha, and Constructed 1961 -1982. Extensions added following 1998 flood.
- Infrastructure includes stopbanks, floodgates, pump stations, control gates, weirs, diversion canals, and erosion control. RV \$170 Million

Lower Waikato Flood Control Scheme and Drainage Network



Land Drainage Schemes

- Constructed and developed over more than 100 years, largely within flat land as community managed drainage networks.
- Managed through partnerships with landowners. WRC manages and maintains the primary network.
- Within the PPC1 area, WRC manages 74 Drainage areas covering approx. 149,000 ha.
- The network includes 1084 km of drains and other assets with a RV \$30 Million



Central Waikato Drainage and Flood Assets Network

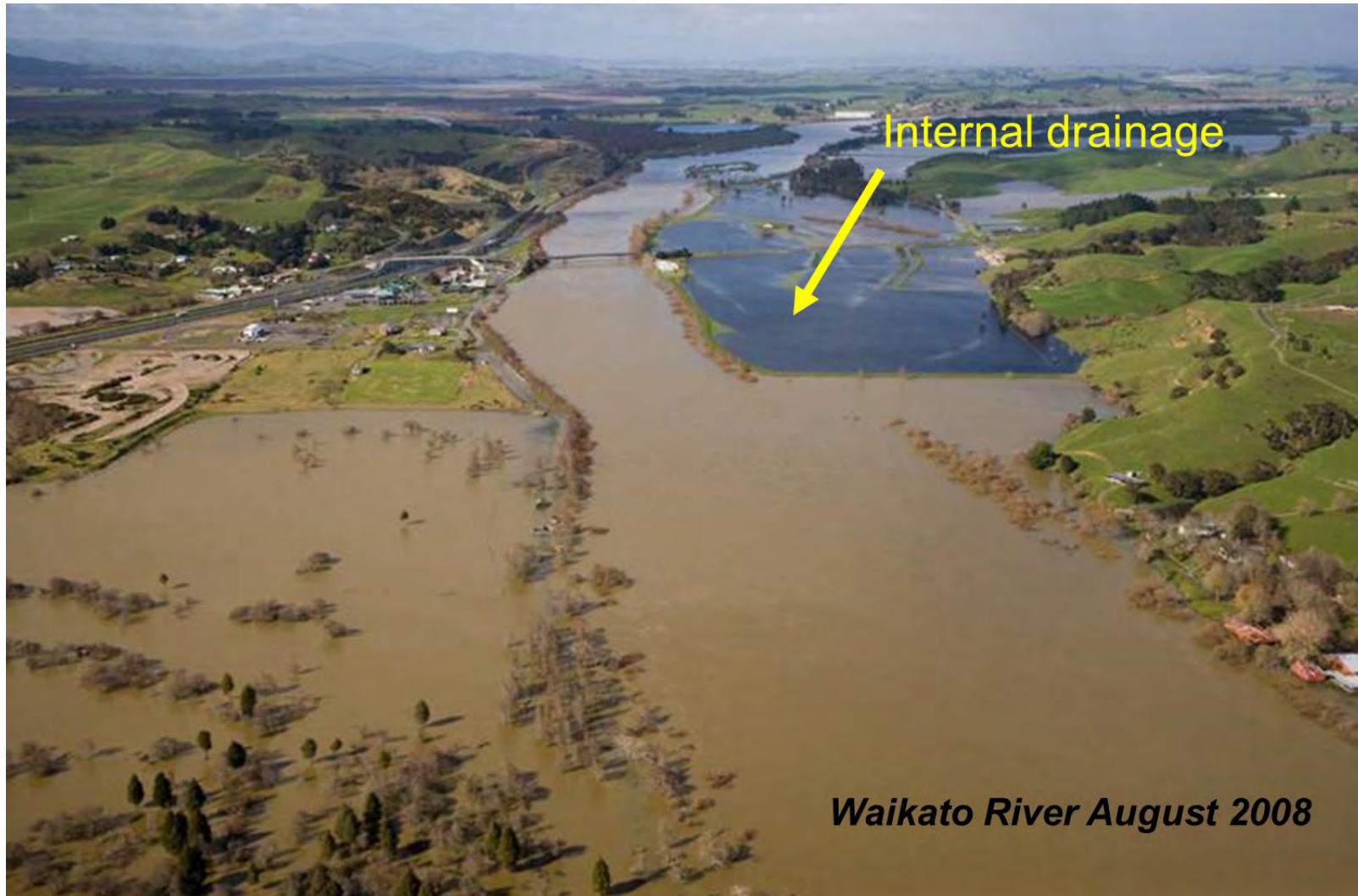


Waipa Zone Drainage and Flood Assets Network

Flood Protection and Drainage Infrastructure

- These are achieved by constructing a network of stopbanks, and drainage culverts under the stopbanks with flap gates preventing back flow from the river/stream when in flood.
- Stopbanks are designed to retain water within the natural system up to specified levels
- Drainage outlets are designed to pass local catchment runoff/flows downstream, largely by gravity.
- Pump stations are installed to mechanically assist evacuation of local runoff in areas where gravity drainage is not adequate to preventing ponding.

Flood and Drainage at work



Waikato River August 2008

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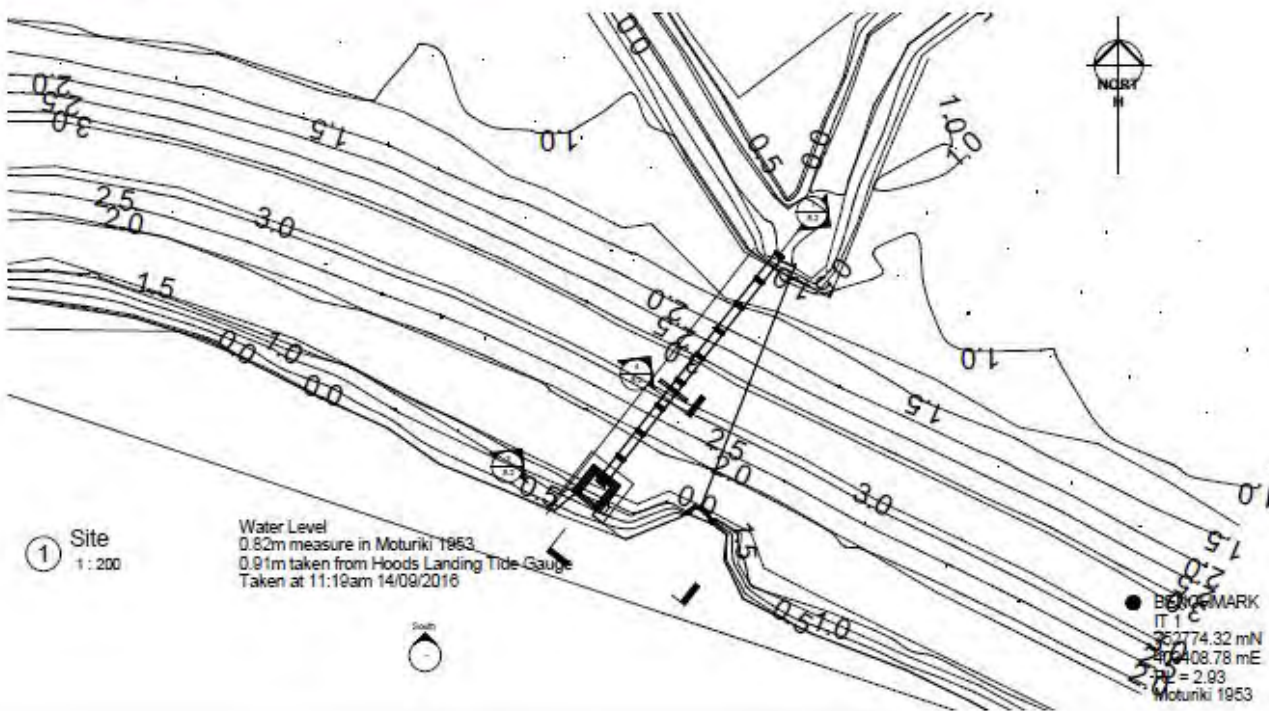
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Flap-gated drainage culvert (floodgate) – Aka Aka



ASBUILT

Locality Plan NTS



- NOTES
1. Read notes on all sheets together with specifications and verify engineer responsibility of any discrepancies.
 2. All dimensions are in mm, do not scale.
 3. Levels based on Moturiki Datum 1953.
 4. Control based on LIND 986 ASHS and local benchmarks Aka Aka JA, T, B and 28.
 5. Grade benchmark IT 1
 a. Coordinates 352774.32mN 4008.78mE
 b. Level R.P. 2.93m

Pump Station Intake – Huntly West



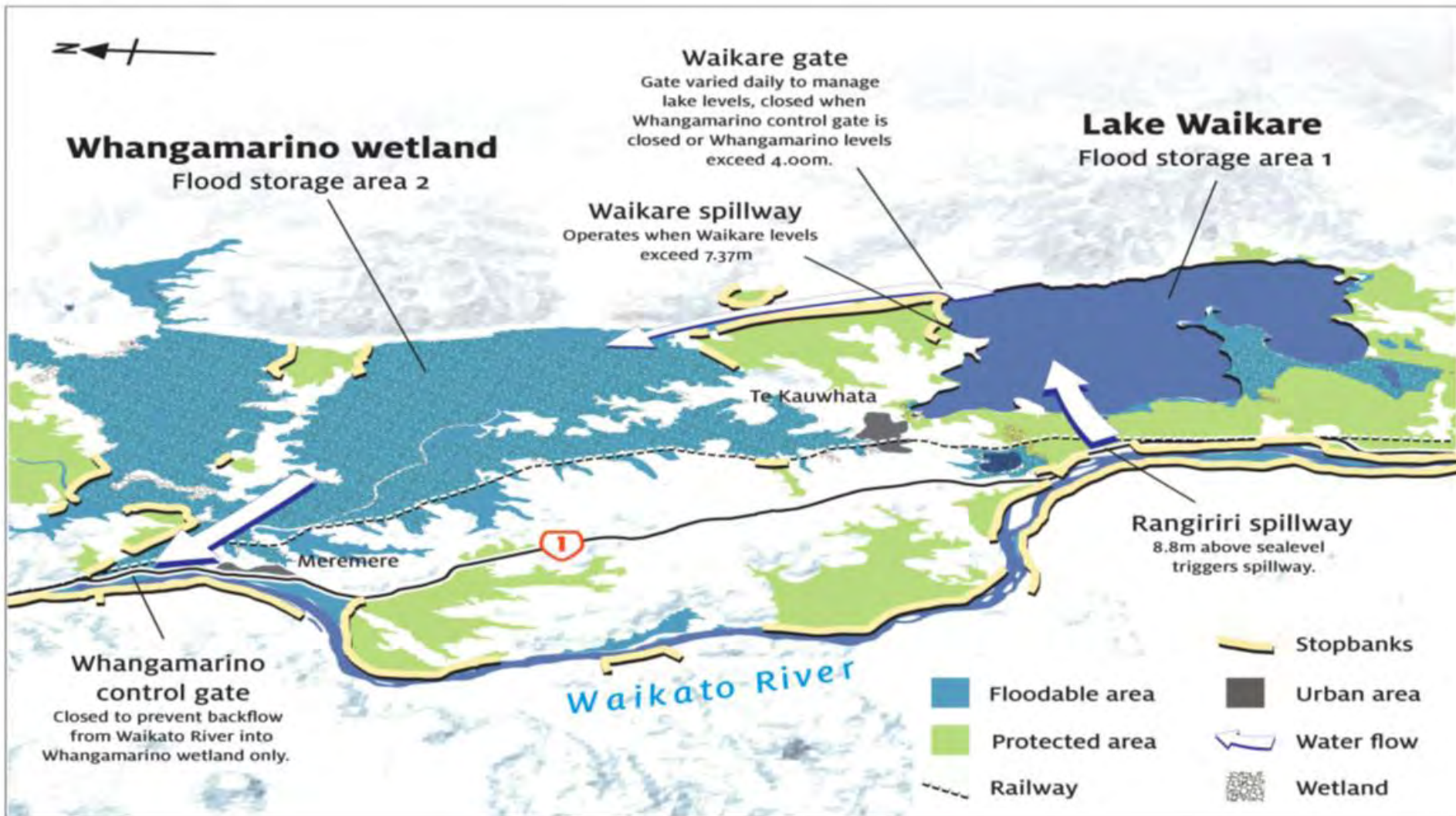
Infrastructure Operation & PC1

- Infrastructure receives and discharges the water from drained land.
 - Structures are designed for conveyance
 - Do not add contaminants to the water.
 - Might slightly change rate and duration of discharge, however total contaminant loads remain unchanged
 - Under flood conditions, drainage discharges are very small compared to river flood flows.
 - Under normal/dry conditions, drainage is flow through.
- PC1 aims at reducing contaminants at source (eg. land)

Rebuttal Evidence of Dr. H Robertson

- *Paragraph 10 – Does not agree with the statements in paragraphs 29 and 30 of my evidence.*
- Paragraph 29 covers the majority of land drainage and flood protection assets, which in my opinion (as described in my earlier slide) are direct conveyance assets.
- Paragraph 30 relates to one section of the LWWFCS which includes 3 Control Gates and a Canal. These are authorised by a suite of consents, and do not represent the whole scheme.

LWWFCS - Community Works- 1965



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Control Gates

- Waikare Control Gate (NOCG) was designed to mimic the pre-scheme overflow discharge of Lake Waikare into the wetland.
- These gates are authorised (dam/divert and control for flood storage purposes) by consents. Function is different to rest of scheme
- Sediment discharges have increased for several reasons. This effect has been the subject of s128 review.
- The consent order sets a process and several actions for addressing the sediment discharge into the Wetland.
- The consents are the appropriate place for addressing the issues raised by Dr. Robertson

Treatment of Contaminants

- Treatment typically involves slowing/holding runoff for an adequate time to allow natural settlement of suspended sediment.
- Technically, this conflicts with drainage which aims at conveyance of runoff within a short timeframe.
- Significant land area would be needed to implement systems of in-line and off-line ponds for settlement of sediment and associated contaminants
- Flocculation and chemical treatment might be necessary.
- Ongoing sediment removal and maintenance is required to ensure effectiveness of these systems

Ability to Treat Contaminants

- The outlet structures are not designed for water treatment.
- Treatment must occur outside the infrastructure boundaries, (eg. on land that ICMD does not own).
- Significant technical challenges involved in ensuring levels of service while treatment of contaminants.
- Significant capital costs and ongoing maintenance costs, to targeted ratepayers
- Significant risks and liabilities associated with treatment ponds overflowing, breaching under flood conditions.
- Management at source for such vast areas on farm scale reduces such risks significantly

Questions