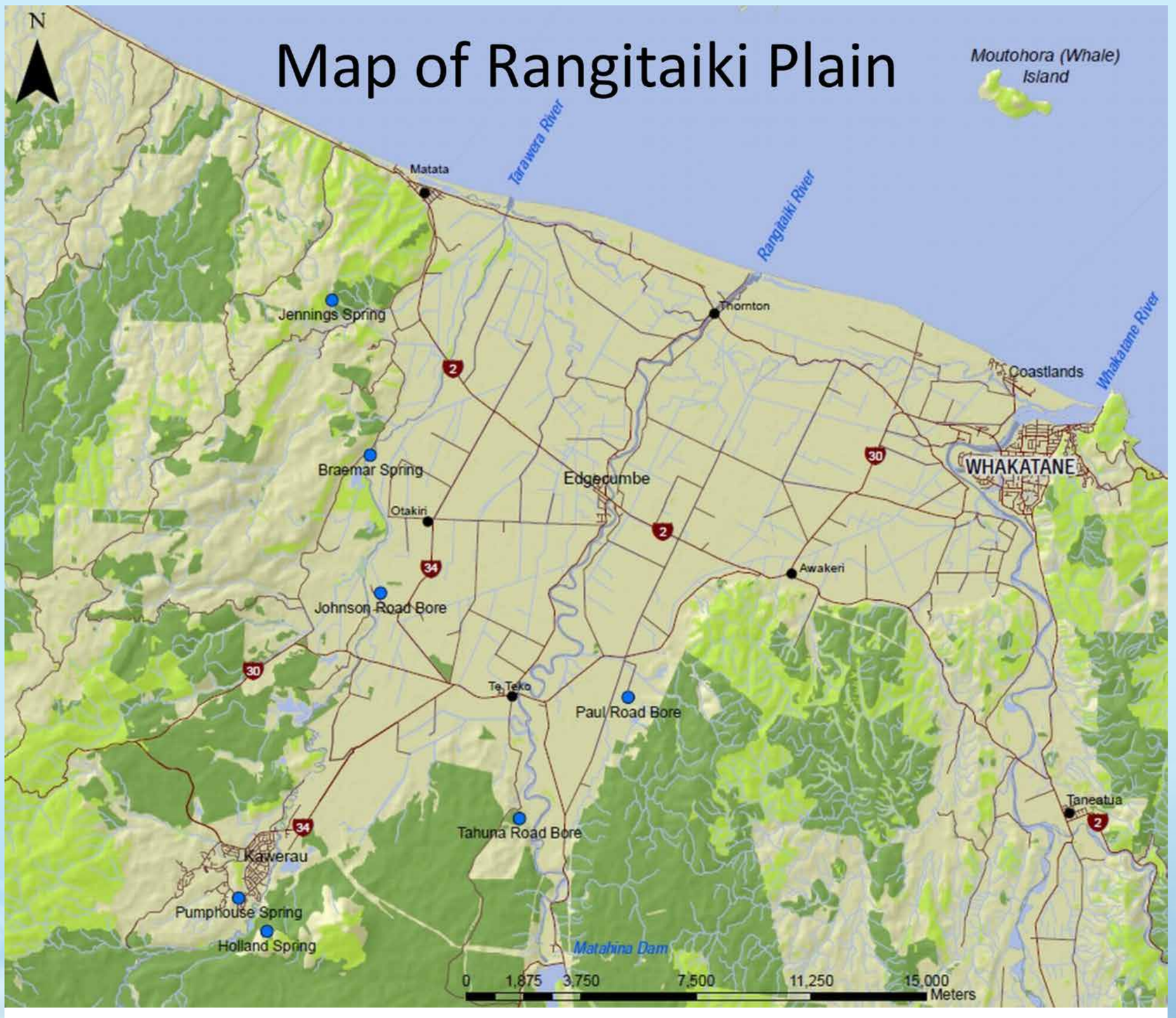
Rangitaiki Plains Community Irrigation

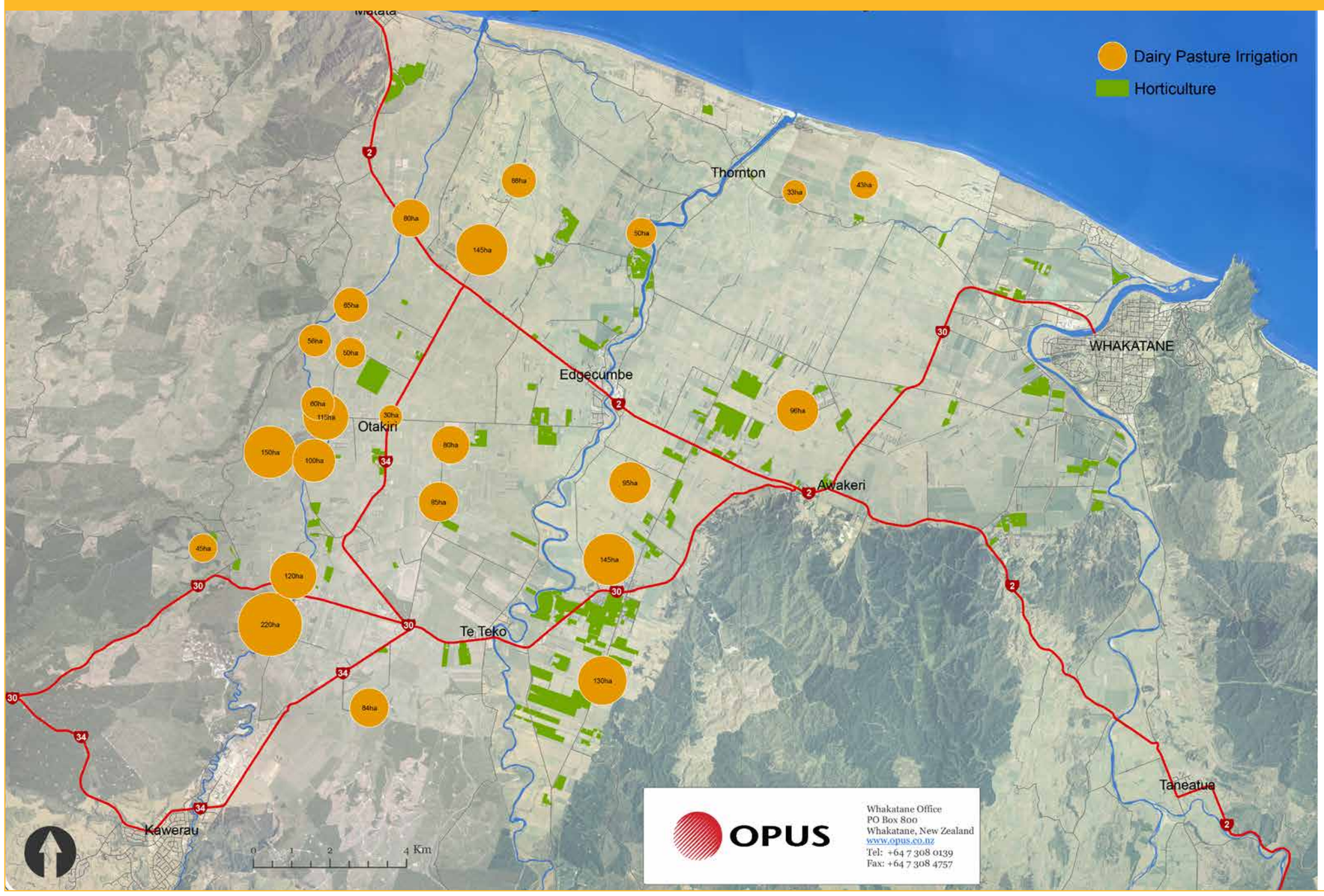


Map of (lower) Rangitaiki Plain

Total Plains area approx. 30,000ha.
More than 80% is in dairy and approx.
3% in horticulture

Current situation

Irrigated areas of dairy pasture and horticulture



Approximately 10% of the Plains area is already irrigated by individual landowners (over 3000ha) each sourcing their own surface or groundwater takes. The more readily accessible sources have been targeted to date.

Hectares under irrigation – 2170 (dairy) and 900 (horticulture)= total consented water takes from all sources 3070ha

There is on-going interest in irrigation from some currently un-irrigated farm businesses – particularly dairy

Irrigation Acceleration Fund (IAF)

Community Irrigation Fund opens

Whakatāne District Council and Bay of Plenty Regional Council successful application to the Community Irrigation Fund (now called the IAF)

Funds used to investigate opportunities for a community irrigation scheme in parts of the Rangitaiki plains

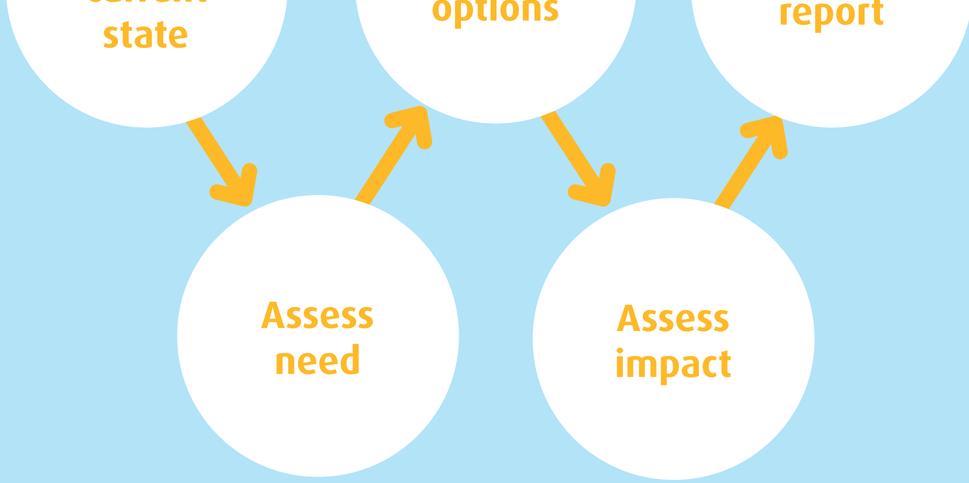
Councils have reviewed the investigation and recommended information be shared with community

We are here!

Investigation

"Viability of a community irrigation project on the Rangitaiki Plains"

Five steps
(5 reports 2010-2013)

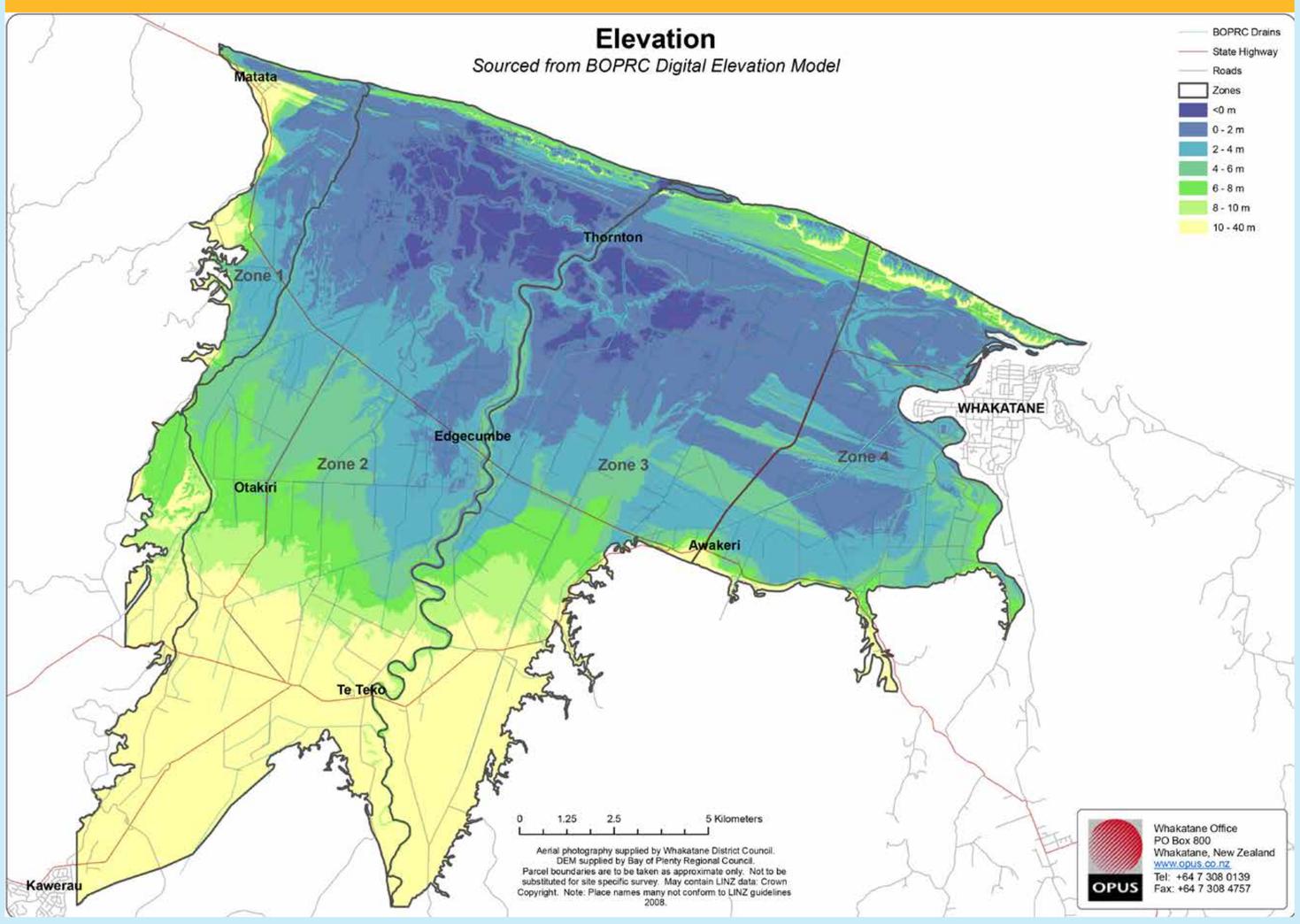


Key base information was considered to determine irrigation need/priority (1. Elevation, 2. Soils, 3. Soil drainage)

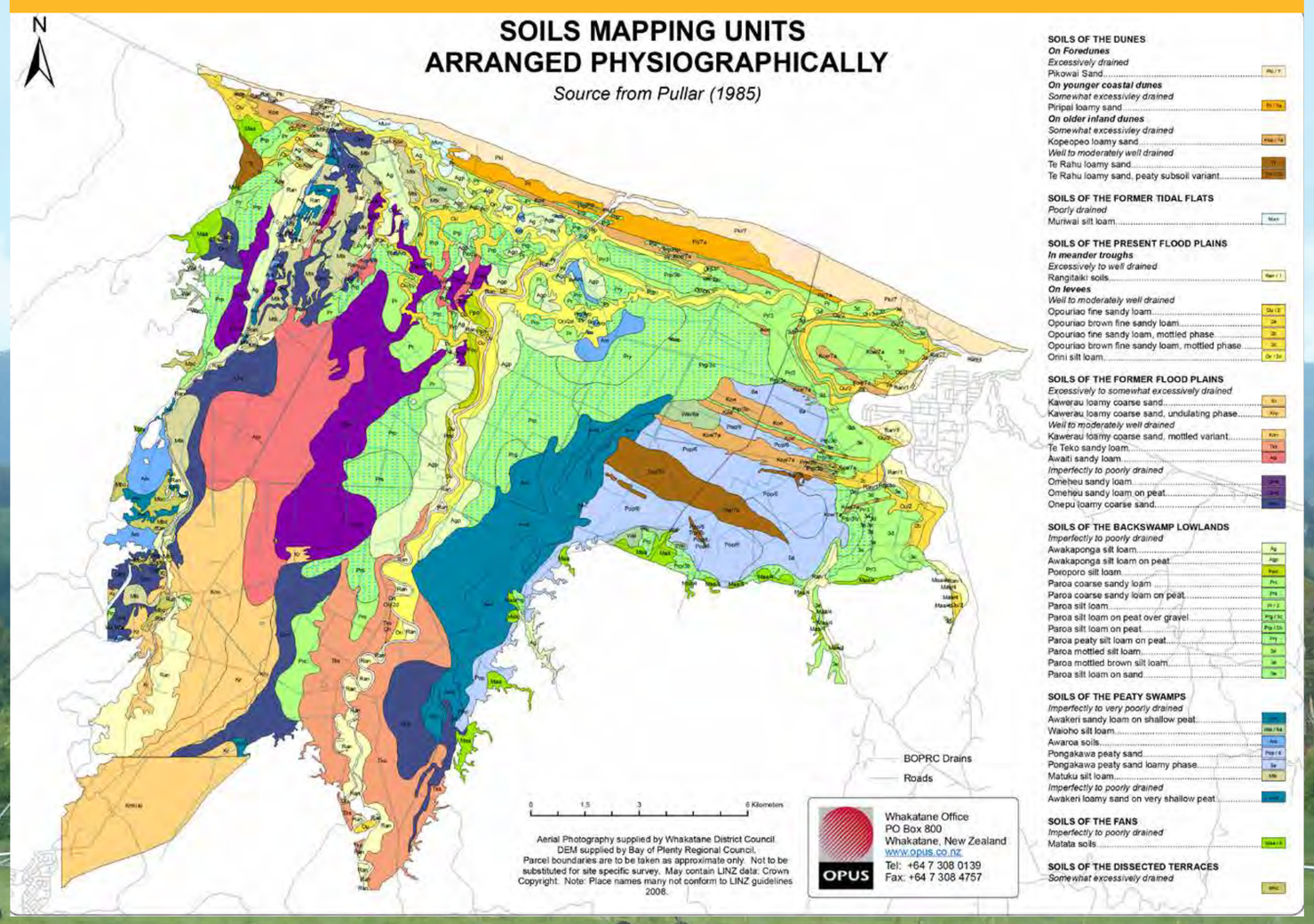
- Part 1 – 5 Reports have been presented to WDC Plains Water Supply Special Committee
- Part 5 Summary Report presented to WDC Projects & Services Committee, Rangitaiki River Forum and Bay of Plenty Regional Council
- Workshops have been held with stakeholder representatives
- Example scheme options have been evaluated to pre-feasibility/ rough order cost level to get appreciation of general viability

All options (not just ones evaluated) are still open for discussion

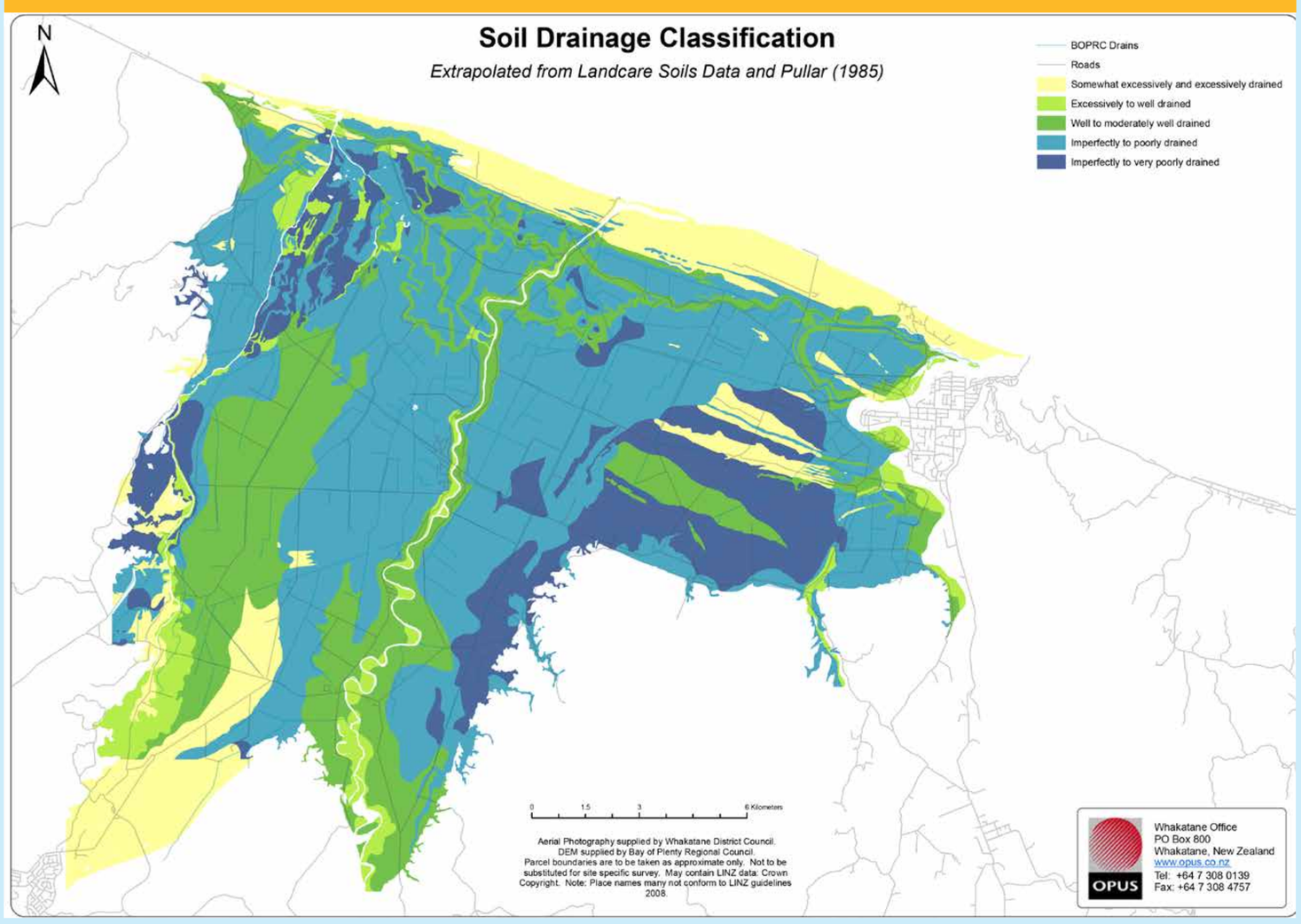
1. Elevation



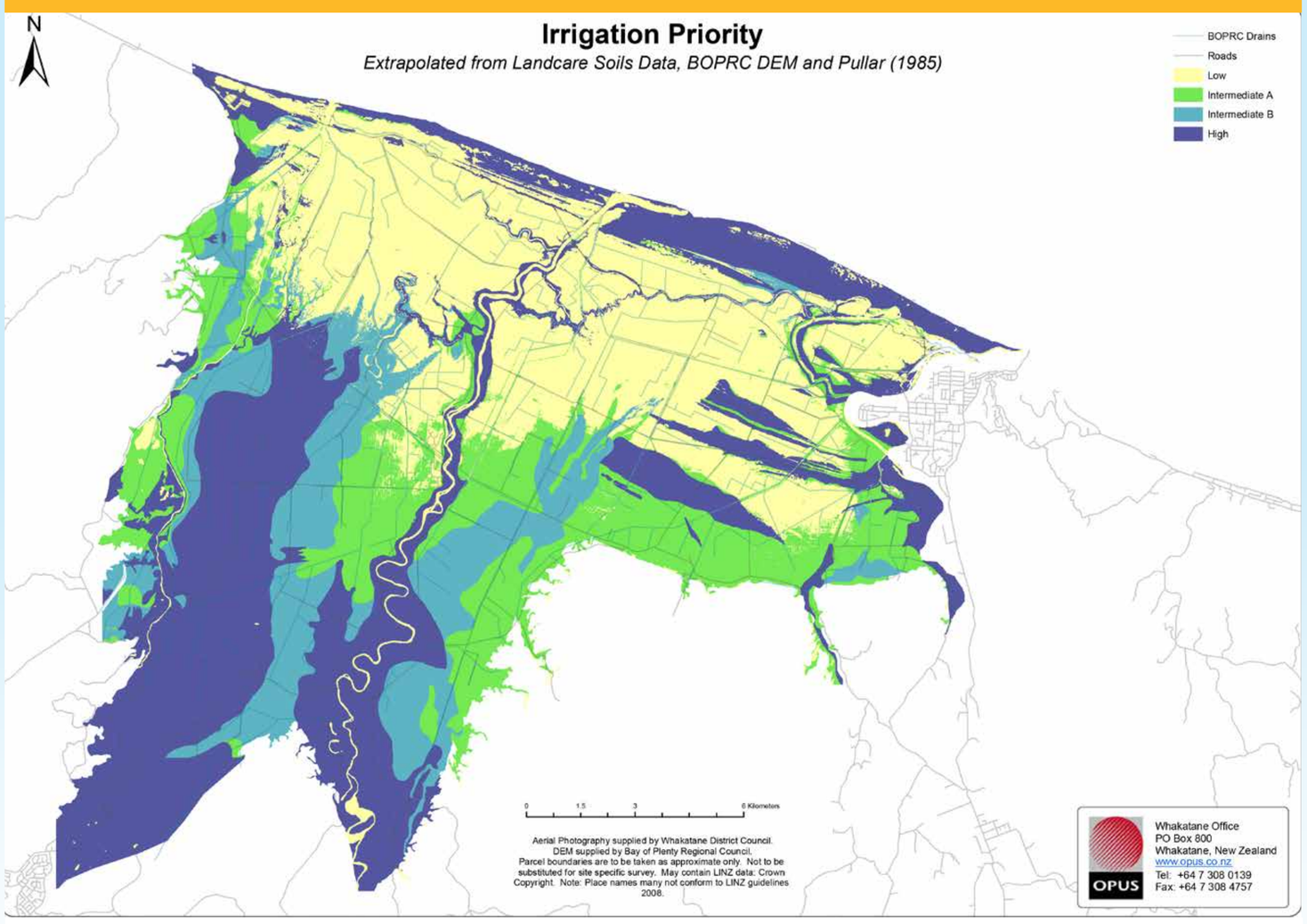
2. Soils



3. Soil drainage



This led to the irrigation priority map



'High Priority' areas need/respond well to irrigation in virtually all years;
'Intermediate B Priority' areas need/respond well to irrigation in most years;
'Intermediate A Priority' areas benefit from irrigation in drier than average years;
'Lower priority' areas with elevations below 2m don't generally require irrigation in average seasons but would benefit from irrigation in dry years.

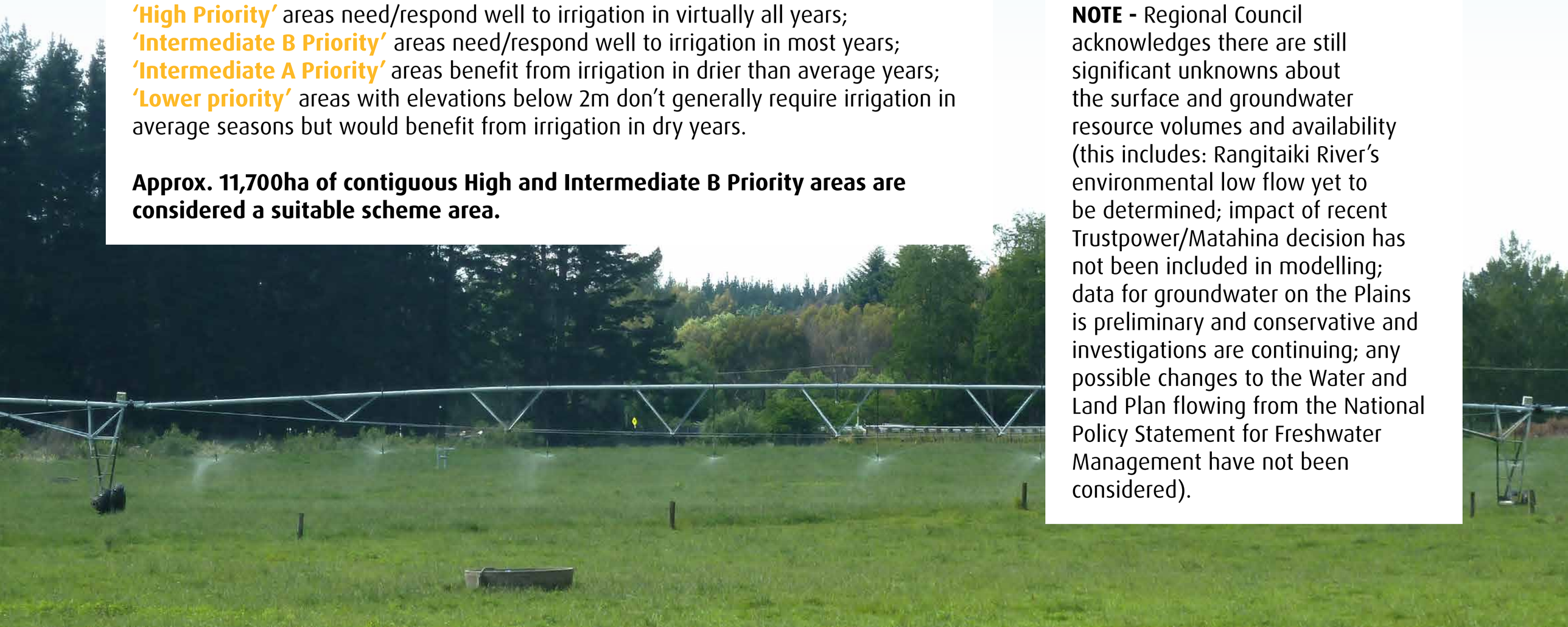
Approx. 11,700ha of contiguous High and Intermediate B Priority areas are considered a suitable scheme area.

Water availability

Model assumptions for Irrigation water supply

- Mainly from surface sources (Tarawera and Rangitaiki Rivers) and assumed Tarawera made a greater contribution than Rangitaiki River
- Assumed potential for some deep groundwater (bores unspecified) to supplement surface take
- Assumed sufficient water from surface and groundwater sources to irrigate the area to be supplied up to a 1 in 5 year low rainfall
- BOPRC scientists consider reasonable likelihood of some allocation capacity in the lower Rangitaiki and Tarawera Rivers

NOTE - Regional Council acknowledges there are still significant unknowns about the surface and groundwater resource volumes and availability (this includes: Rangitaiki River's environmental low flow yet to be determined; impact of recent Trustpower/Matahina decision has not been included in modelling; data for groundwater on the Plains is preliminary and conservative and investigations are continuing; any possible changes to the Water and Land Plan flowing from the National Policy Statement for Freshwater Management have not been considered).



Modelled 4 preliminary options

Assumptions:

- To farm gate (on-farm works are extra)
- Area to be supplied approx.11,700ha
- Apply 5mm/day peak (January)
- Assume sufficient water to irrigate up to 1 in 5 year low rainfall without restriction
- Required peak flow rate from all sources is approx. 6.7m3/s
- Established preliminary layouts of reticulation
- Generated nominal pipe diameters, pressure ratings, pump duties, energy requirements

Consideration of a storage reservoir

- Rangitaiki Plains annual rainfall is relatively high and an irrigation scheme would increase growing season reliability to support production
- Storage is one way to increase % reliability of a scheme
- Storage costs likely to be high – approx $6 per cubic metre (10% storage volume approx 4.7 million m3).
- Affordable ? What % reliability do users want?
- Note that model options 1-4 do not account for a storage reservoir which could double the cost of a scheme

About each model

Modelled Options 1-4 - assumes water supply mainly surface (river) sources; with potentially some groundwater (bores unspecified).

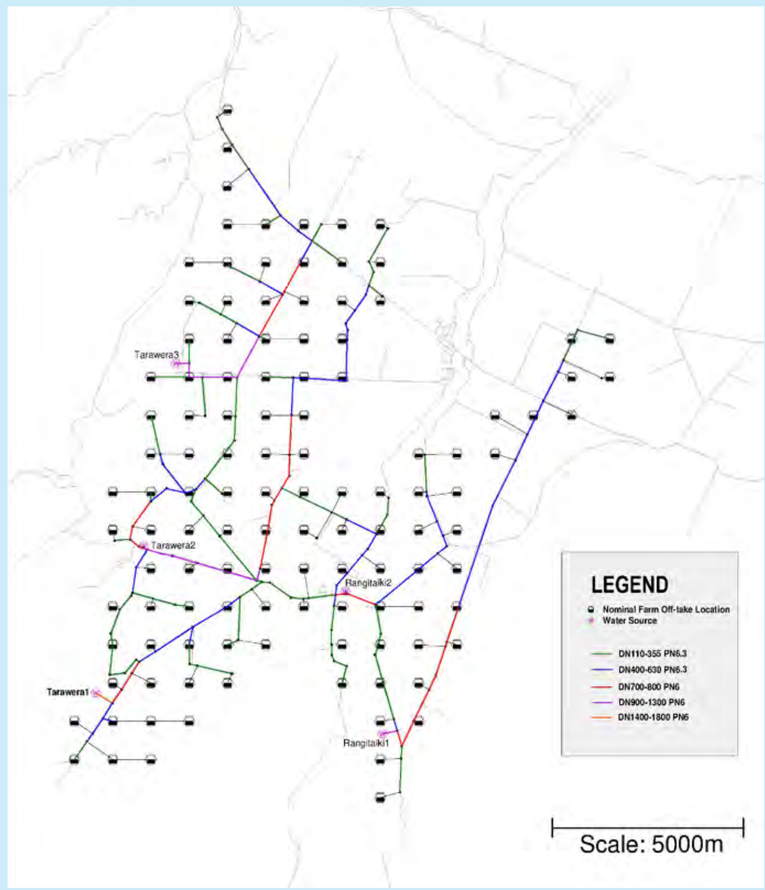
Model 1 – Assumes 2 river sources – one from Rangitaiki River near SH30 Bridge Te Teko; one from Tarawera River near SH 30 Bridge Onepu.

Model 2 – Assumes 5 river sources - two from Rangitaiki River - one near SH30 Bridge Te Teko and one near the Galatea Road/Macdonald Road intersection; - 3 from the Tarawera River - one near SH34/Onepu Springs Road; one near SH30 bridge Onepu; one near Otakiri Road/ Otakiri Soldiers Road intersection.

Model 3 – Assumes two sources – one from Tarawera River near SH30 Bridge Onepu; one from Matahina Dam.

Model 4 – Sources same as for Model 2 but with 40m delivery pressure.

Model 2 example



Initial Captial Cost Range estimates

Capital costs $m								
Components	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
Primary distribution pipe	22.9		19.5		28.2		26.5	
Pump stations	9.9		10.1		7.6		17.1	
Structures and fittings	5.3		5.1		5.6		5.5	
Intake structures	1.3		2.7		1.3		1.3	
Control and measurement systems	0.7		0.7		0.7		0.7	
Construction Management	1.7		1.7		1.7		1.7	
Totals	Most likely cost	Expected upper limit cost	Most likely cost	Expected upper limit cost	Most likely cost	Expected upper limit cost	Most likely cost	Expected upper limit cost
	41.8	**58.5**	**39.8**	**56.4**	**45.0**	**57.8**	**52.7**	**81.0**
Cost per hectare $/ha	3,600	5,000	3,400	4,800	3,800	4,900	4,500	6,900

Annual/ongoing costs (Year 1 of operation) **$**				
Components	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Energy costs	980,000	980,000	750,000	1,670,000
O&M: pipe	230,000	200,000	280,000	260,000
O&M: Structures and fittings	260,000	250,000	280,000	280,000
O&M: Pump stations	500,000	510,000	380,000	850,000
Operator labour and expenses	100,000	100,000	100,000	100,000
Payment to TrustPower for abstraction from Matahina Dam	-	-	220,000	-
Total ongoing costs	**2,070,000**	**2,040,000**	**2,010,000**	**3,160,000**
Ongoing costs per hectare $/ha	177	174	172	270

Key findings for models 1-3

- Provides initial rough order capital costs ($40-58M) and on-going costs (approx $2.0M per annum) for Models1 - 3
- (Model 4 provides a higher level of service i.e. 40m delivery pressure but much higher cost)
- Models 1-3, 5m delivery pressure and similar whole of life costs
- Annualised capital and on-going costs for models 1-3 is $543/ha/year
- The $543/ha/yr would be an Annual Water Charge if landowners wanted to join scheme
- Financial assessment (Report 4) shows net benefit - indicates community irrigation scheme is viable for farm businesses
- Dairy farms with existing viable irrigation supply are unlikely to be better off joining a scheme
- Currently un-irrigated dairy farms within higher irrigation priority areas with no easy access to private water supplies for irrigation, would be better off joining the scheme
- Irrigation may open up new land use options for current dry land

Issues and challenges
for a community irrigation scheme to consider

- What % reliability do users want?
  - Investment vs Risk
  - Irrigation as Insurance
  - High levels of service likely require storage
  - Expect wide range of views on above
- Competition for the Water Resources
  - Hydro Electricity
  - Upper Catchment Irrigation
  - In-Stream needs
  - High quality deep groundwater
  - Normal consent application processes would apply

Irrigation is just one of many demands on the water resource

Where to from here

- Findings to date indicate a potentially viable scheme
- Work done can be expanded to look at different areas/options /levels of service
- Share the information with the wider community

Where do you want to go from here?

For consideration: Crown Irrigation investment company

- Capital funding for water storage and off-farm irrigation infrastructure, $400m over 5 years NZ-wide
- Rationale –encourage delivery of ‘optimum build’ schemes to maximise economic growth
- Crown irrigation investment company would be a ‘reluctant and minority investor’
- NOT A GRANT - company would seek appropriate returns on its investments

Operational from July 2013, 2013/14 budget $80m (NZ wide)