

# Upper Maire Sub Catchment Block 3

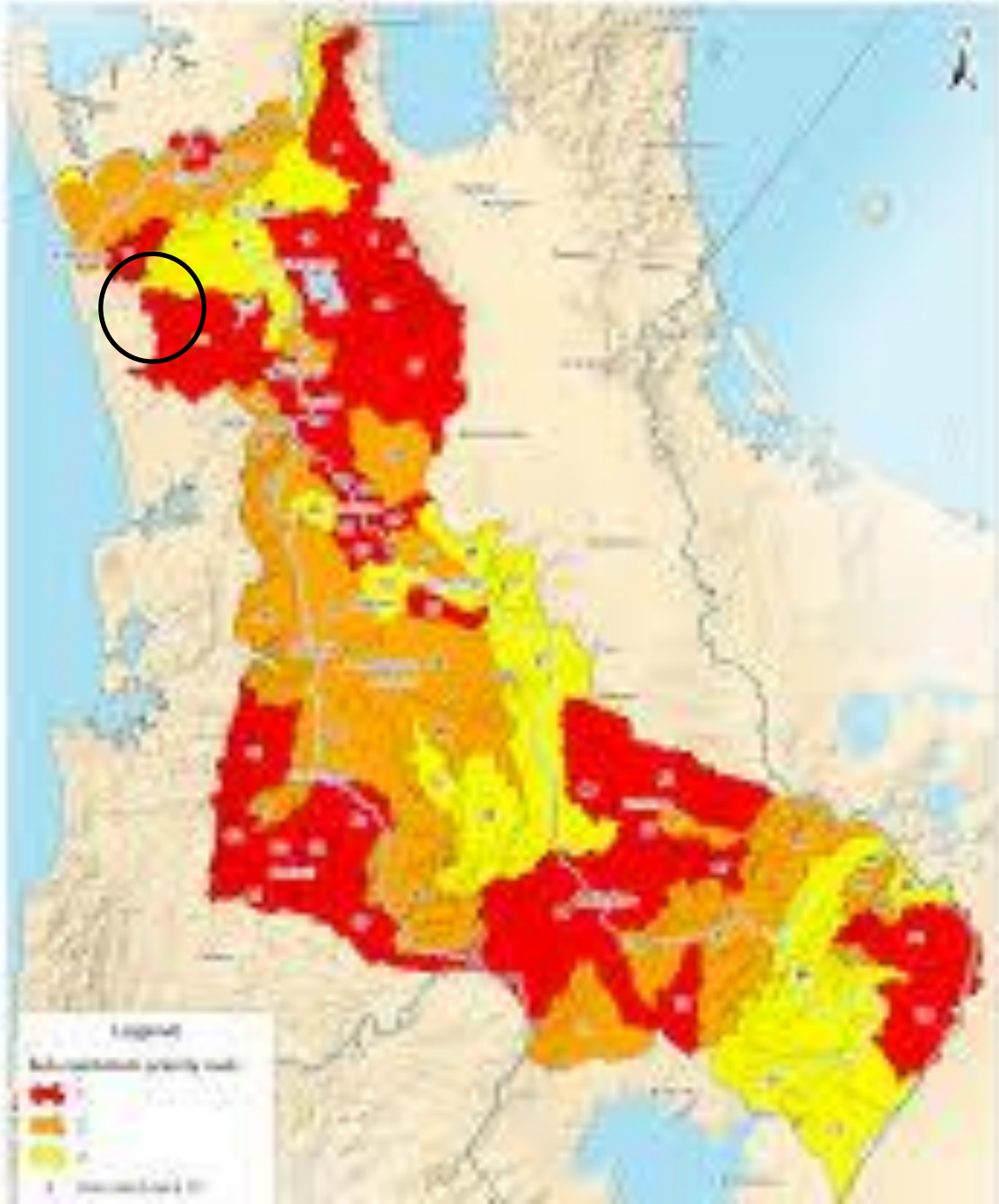
Priority 1 lower Waikato River  
Riverine lake FMU  
Lake Whangape

# The Plan

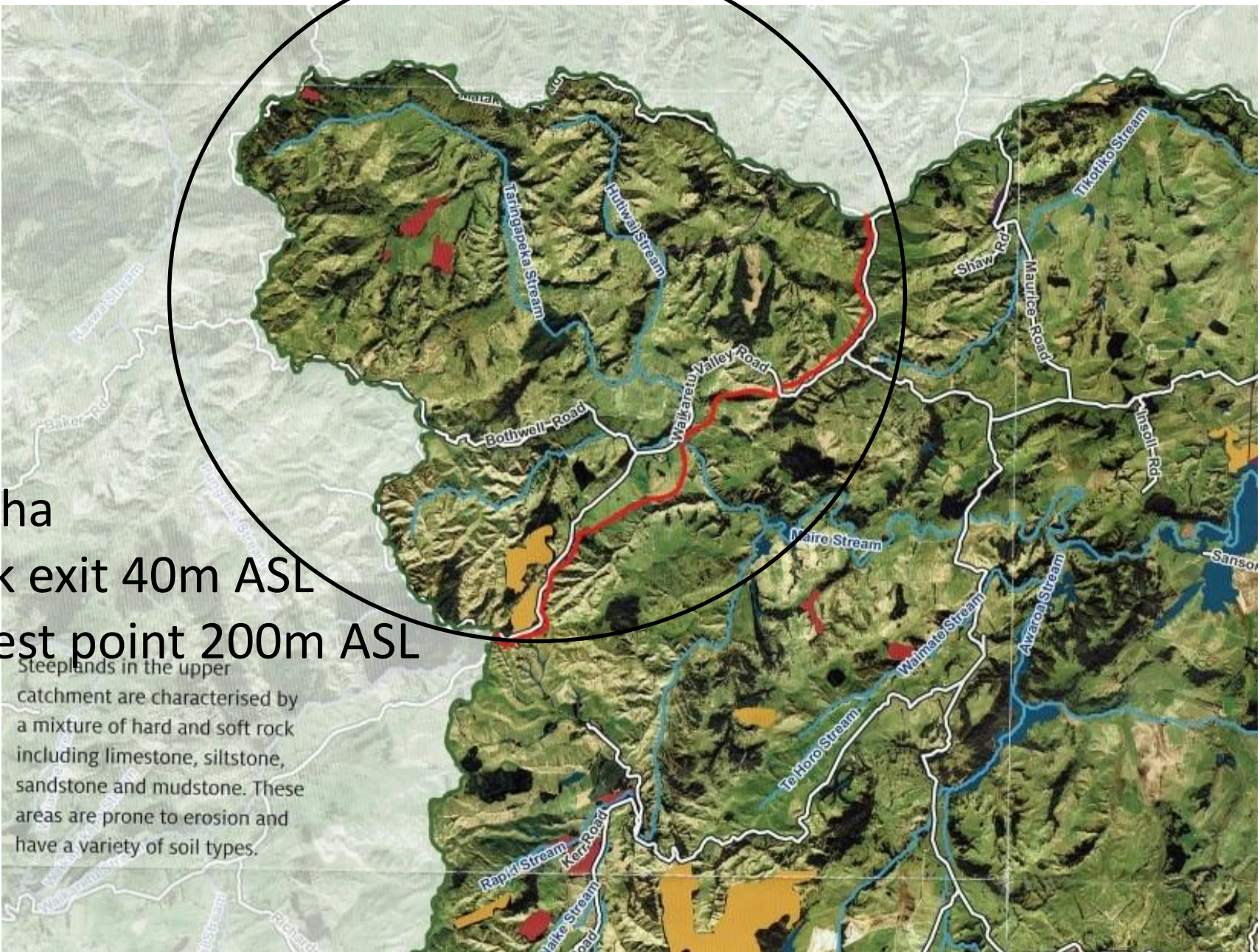
1. Working with a sub catchment group
2. Working within a sub catchment group
3. How sub catchment groups could work within PC1

Firstly

- Recap on Upper Maire Sub Catchment
- Issues raised from Block 2 hearing

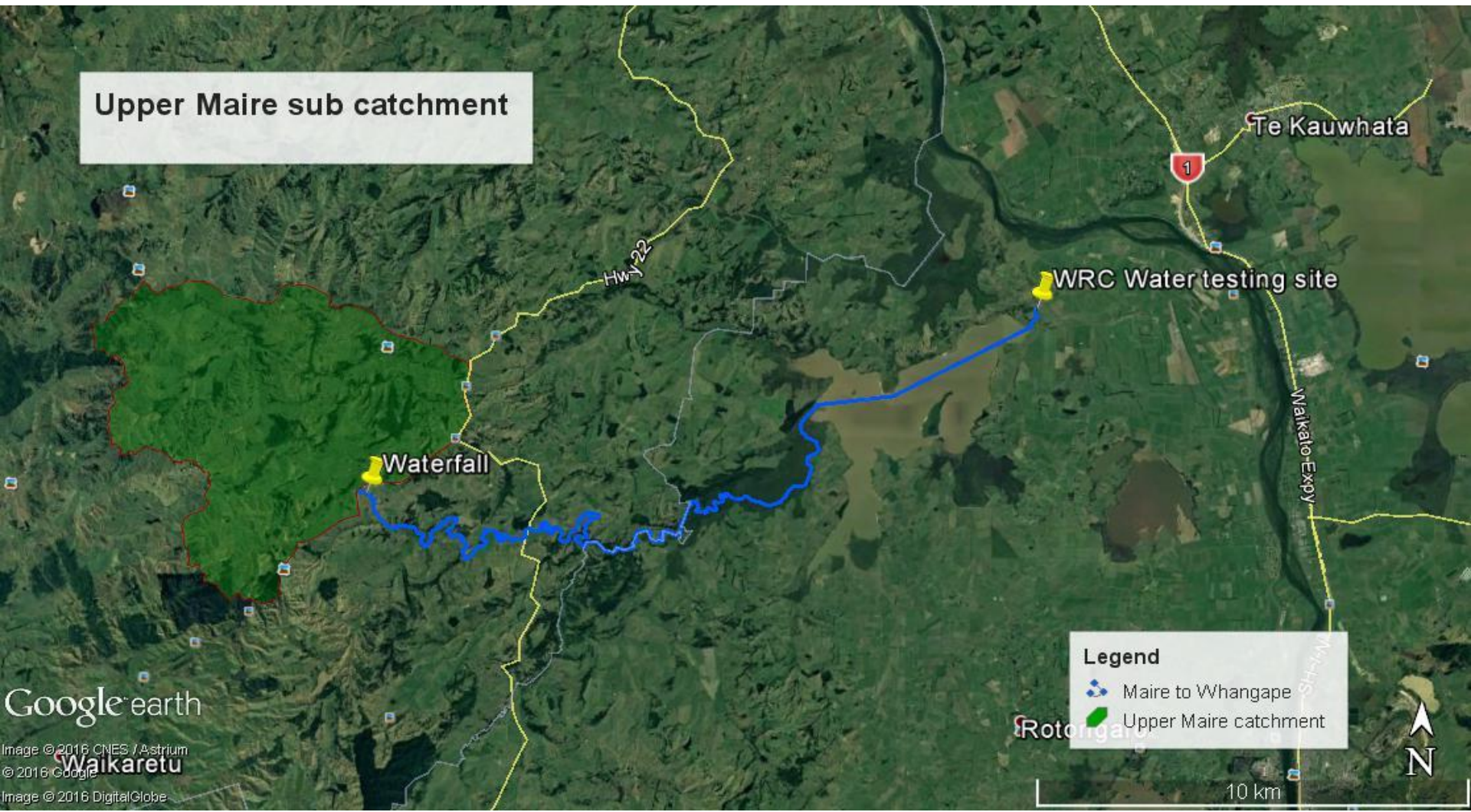


4000ha  
Creek exit 40m ASL  
Highest point 200m ASL



Steepplands in the upper catchment are characterised by a mixture of hard and soft rock including limestone, siltstone, sandstone and mudstone. These areas are prone to erosion and have a variety of soil types.

# Upper Maire sub catchment



### Legend

- Maire to Whangape
- Upper Maire catchment

Google earth

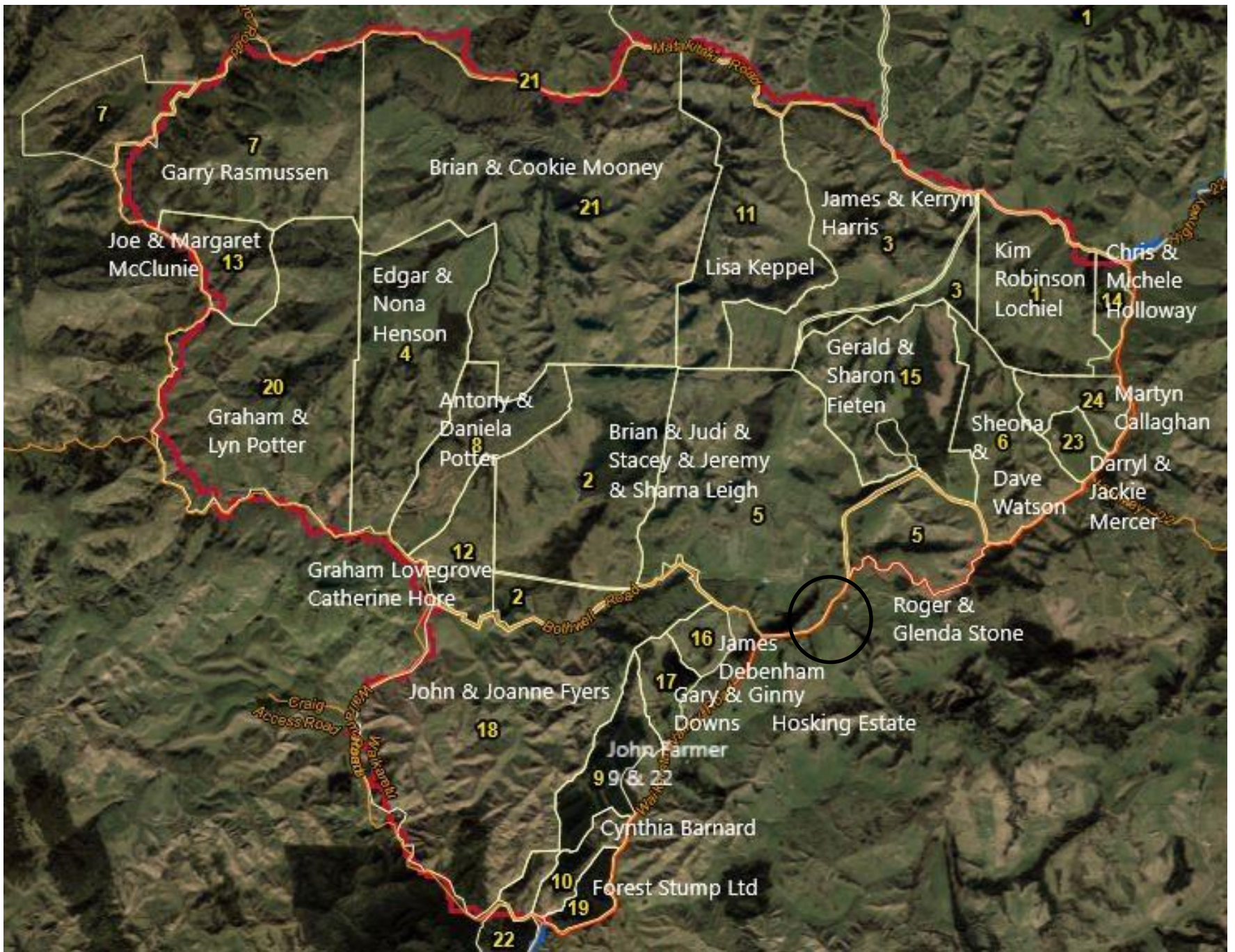
Image © 2016 CNES / Astrium

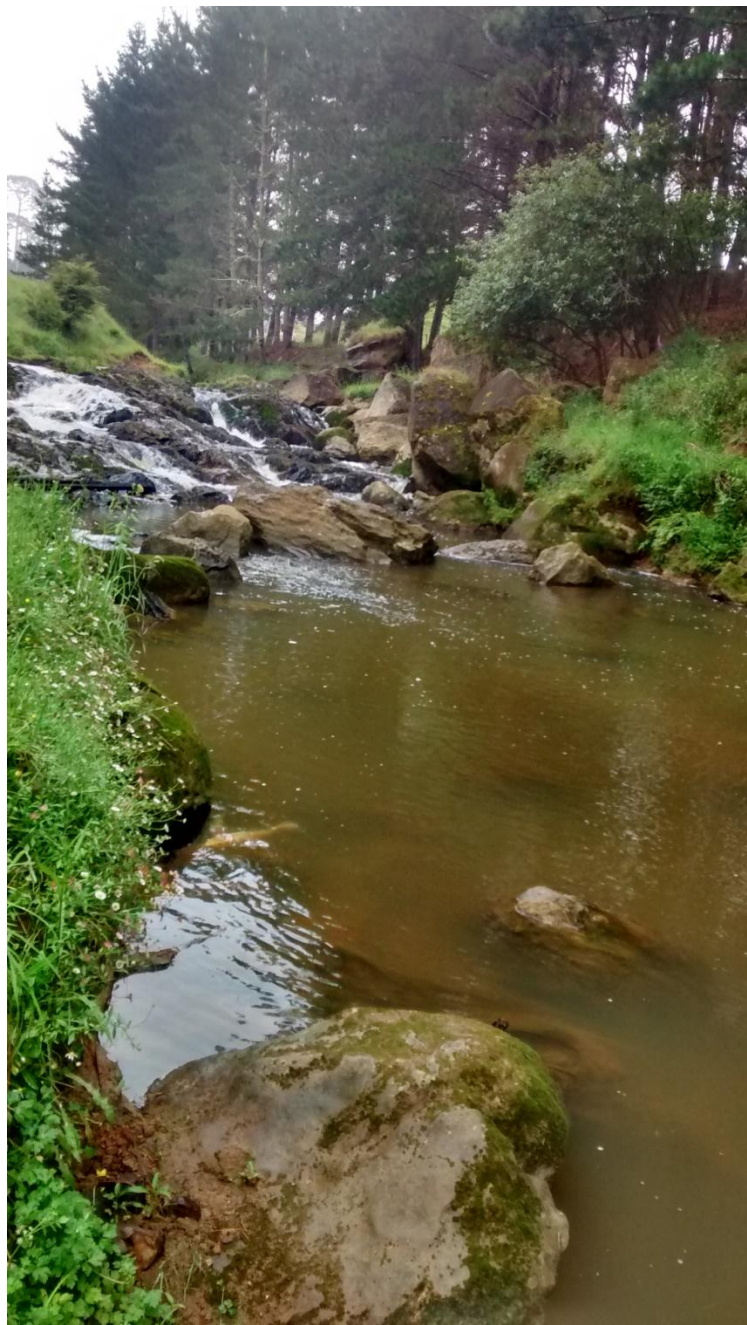
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# Upper Maire Subcatchment

- 15 farmers >20ha
- 4000 ha hill country
- Low intensity family farms
  - Low N use
  - Sheep and cattle – dairy farming
  - No winter crops – limited cropping / regrassing
  - Exit waterfall prevents Koi carp
  - High flood zone
- 2018 formed Upper Maire Land Care Society







# Upper Maire sub catchment

- Members have attended
  - Risk & Mitigation workshop (WRC)
  - Farm Environment Planning workshop (B+LNZ)
  - Water Quality workshop (B+LNZ)
- Water quality testing
  - Hills Lab test exit 4 x per year
  - Tributaries and correlating with Hills lab
  - 3 SHMAK tests purchased (clarity tube, Phosphate readers, Nitrate test x 1)

# Water quality testing



# Upper Maire Landcare Society

- 2018 formed Incorporated Society
  - Each farm paid \$1 per hectare
  - WRA fund successful – 1160 poplar poles to be planted 2019 & 2020
  - Many members actively looking for funding for other projects such as wetland preservation



# Issues raised from Block 2 hearing

- **Water testing results at Upper Maire exit – Hills Laboratories**

Water testing results				
	Mar-17	Jan-19	May-19	Jun-19
Total Suspended Solids	<5	<3	<3	#
Total N	0.37	0.52	0.32	0.62
Dissolved Reactive P	0.004	<0.0004	<0.004	0.02*
E Coli	70	135	66	#
* Total Phosphorus				
# Not tested				



# Hill Laboratories

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## ANALYSIS REPORT

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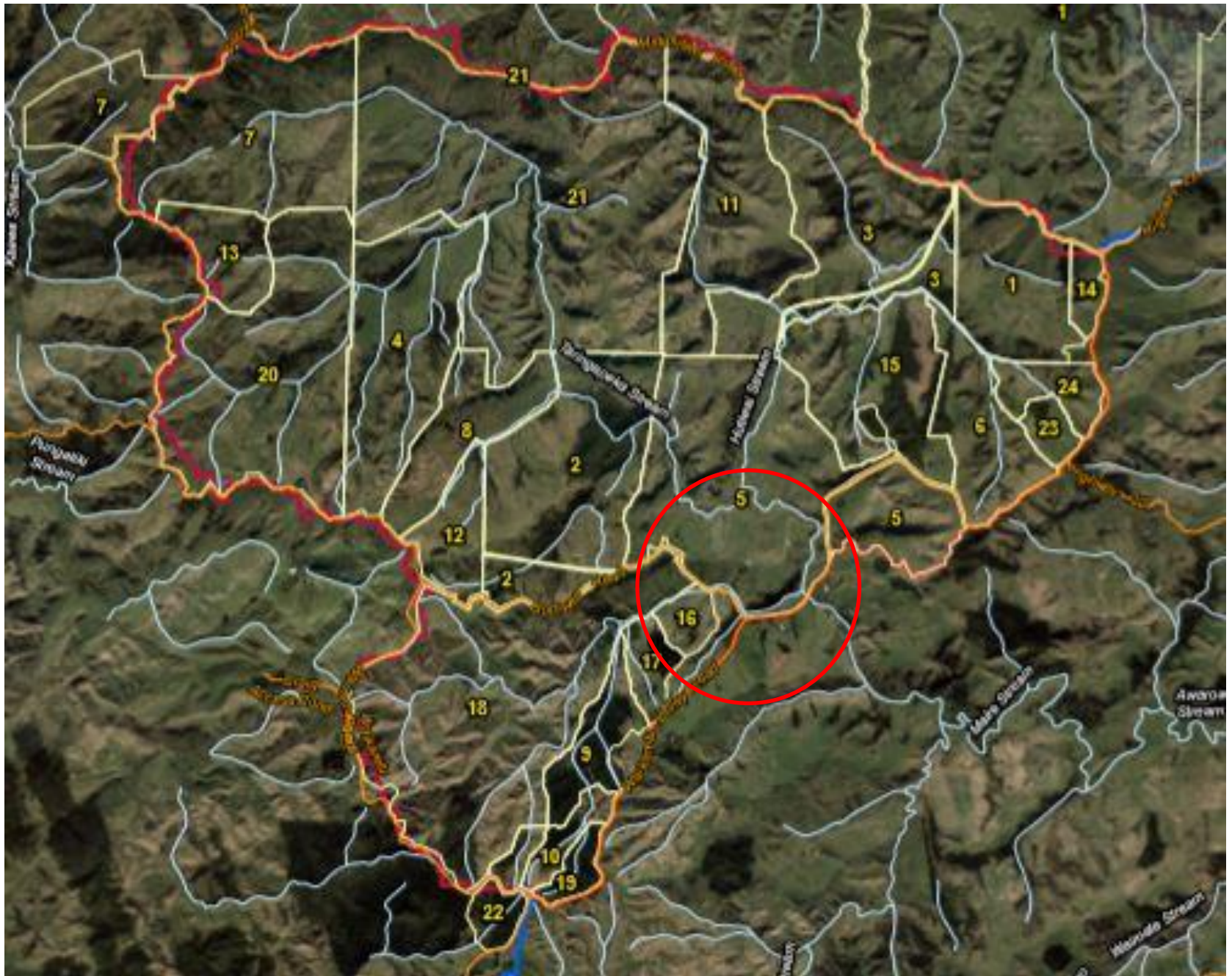
<b>Client:</b>	Bothwell Pecos Limited	<b>Lab No:</b>	1732622	SPv1
<b>Contact:</b>	BJ & J Leigh 312 Waikaretu Valley Road RD 5 Tuakau 2695	<b>Date Received:</b>	01-Mar-2017	
		<b>Date Reported:</b>	08-Mar-2017	
		<b>Quote No:</b>		
		<b>Order No:</b>		
		<b>Client Reference:</b>	BJ + J Leigh	
		<b>Submitted By:</b>	BJ & J Leigh	

### Sample Type: Aqueous

Sample Name:		BJ Leigh 01-Mar-2017 1:00 pm				
Lab Number:		1732622.1				
Total Suspended Solids	g/m <sup>3</sup>	< 5 #1	-	-	-	-
Total Nitrogen	g/m <sup>3</sup>	0.37	-	-	-	-
Nitrate-N + Nitrite-N	g/m <sup>3</sup>	0.027	-	-	-	-
Total Kjeldahl Nitrogen (TKN)	g/m <sup>3</sup>	0.34	-	-	-	-
Dissolved Reactive Phosphorus	g/m <sup>3</sup>	0.004	-	-	-	-
Escherichia coli	MPN / 100mL	70	-	-	-	-

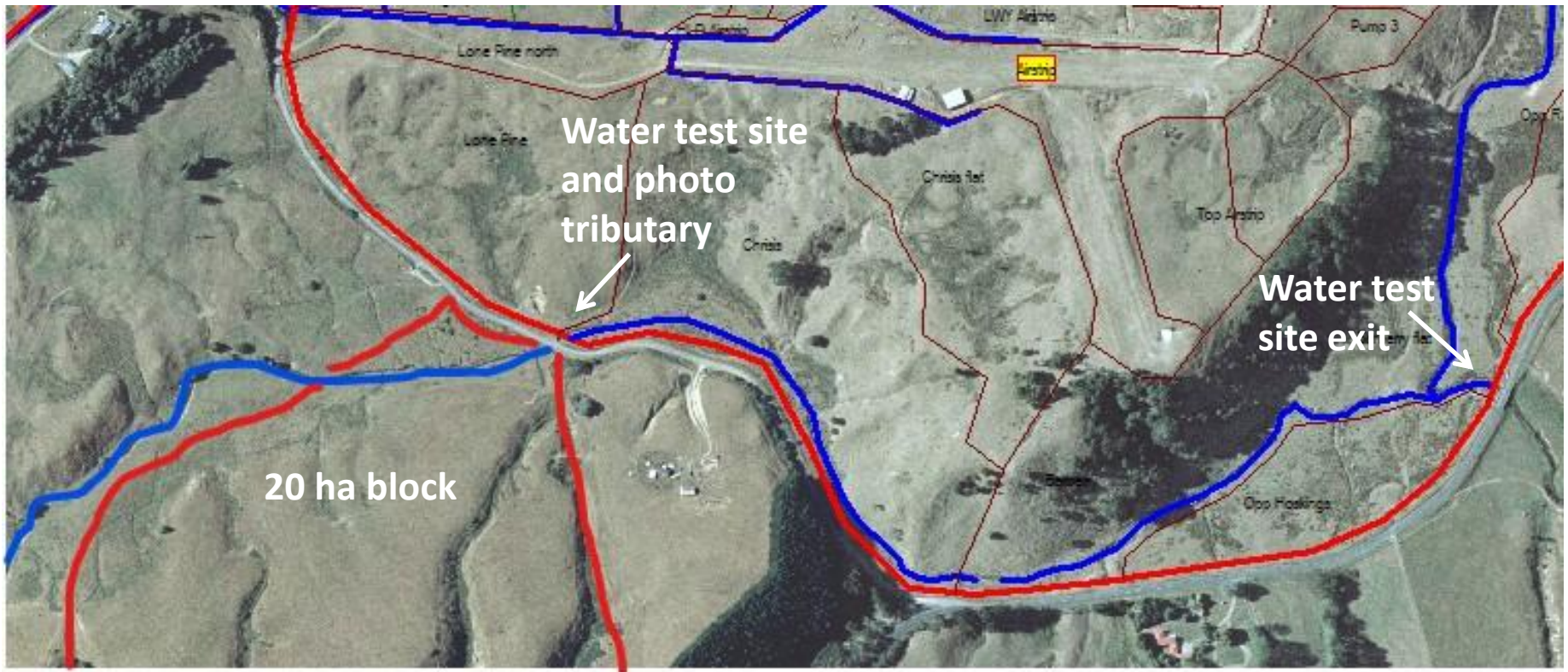
# A sub catchment resolution

	Exit	Tributary	Exit	Tributary
	Mar-17	May-17	Jan-19	Jan-19
Total Suspended Solids	<5	6	<3	7
Total N	0.37	0.35	0.52	1.16
Dissolved Reactive P	0.004	0.01	<0.004	<0.004
E Coli	70	>2420	135	>2420





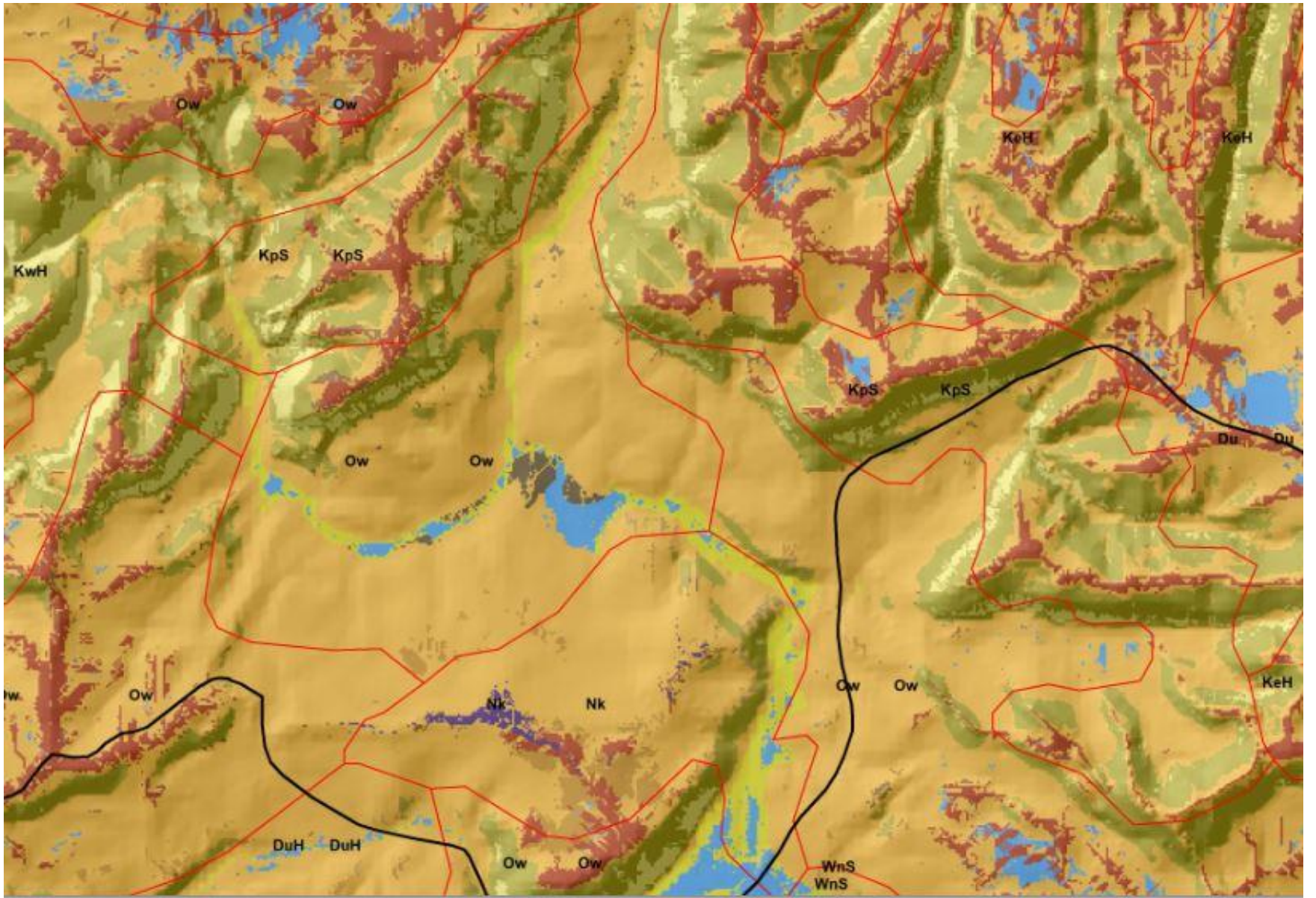
Blue = creek flowing left to right





# P Report Overseer – Inaccurate soil type

Block name	Total P lost kg P/yr	P lost to water kg P/ha/yr	P loss categories		
			Soil	Fertiliser	Effluent
Bothwell Steep Hill	1401	9.1	Extreme	Extreme **	N/A
Bothwell Easy Hill	1358	7.0	Extreme	Extreme **	N/A
Bothwell Rolling	1502	7.5	Extreme	Extreme **	N/A
Bothwell Flood Flats	26	1.8	High	Medium	N/A
Lease Steep Hill	52	1.3	Medium	High **	N/A
Lease Rolling	511	5.3	Extreme	Extreme **	N/A
Bothwell Native Fenced	6	0.1	N/A	N/A	N/A
Bothwell Native	5	0.1	N/A	N/A	N/A
Lease Native	1	0.1	N/A	N/A	N/A
Other sources	103				
Whole farm	4965	6.1			



# Revised soil type from more accurate S map data

The screenshot shows a user interface for a soil analysis tool. At the top, there is a dark blue navigation bar with a 'Show help' button (a question mark icon) and a user profile for 'Jeremy Leigh' with a dropdown arrow. Below this, the word 'oil' is displayed on the left. To its right, several data points are shown in colored boxes: 'N: 8240' (green), 'N/ha: 10' (green), 'P: 2037' (orange), 'P/ha: 2.5' (orange), 'GHG/ha: 3172' (blue), and 'v6.3.1' (grey). A horizontal menu below the data points contains five items: 'SUPPLEMENTS' (with a cow icon), 'FERTILISER' (with a leaf icon), 'IRRIGATION' (with a water drop icon), 'GHG' (with a circular arrow icon), and 'OVERVIEW' (with a grid icon). The 'OVERVIEW' item is highlighted in blue. Below the menu, there is a white box containing the text 'GHG' and 'Comments (1)'. At the bottom, a light blue bar contains the text 'Recommended for this report:'.

oil | N: 8240 N/ha: 10 P: 2037 P/ha: 2.5 GHG/ha: 3172 v6.3.1

SUPPLEMENTS FERTILISER IRRIGATION GHG OVERVIEW

GHG Comments (1)

Recommended for this report:

# 1. Working with a sub catchment group

## Benefits and incentives

- In line with PC1 goal of achieving widespread behaviour change on farm “arouse an eager want”
- Supports community and environmental stewardship
- Funding vessel for greater environmental protection
- WRC works more efficiently and proactively with Sub catchment groups than individual farmers
- Acts as an extension arm to farmers that don't participate in off farm extension – all members reached
- Members are enticed to improve farming practices by group / peer pressure

# 1. Working with a sub catchment group

- Environmental benefits
  - Pooling of resources for larger scale Sub catchment projects
    - Sediment traps
    - Created wetlands
    - Stream naturalisation







# Working with a sub catchment group

- Scott Fraser – Landcare Research
- Don Harford – Waikato Regional Council

“I support the sub-catchment initiative taken in the Whangape sub-catchment.

This approach has seen 6 Risk & Mitigation workshops, 5 more than any other sub-catchment in the Lower Waikato, at this stage.

Each of these workshops have been followed by Beef & Lamb NZ Farm Environment Planning workshops”.

- Don Harford

“They have taken greater ownership of their own streams and rivers and made them more aware of the environmental challenges the local community faces.

It has allowed farmers to share environmental solutions, not previously possible. It has already provided a support group to assist farmers completing their FEP's.

I believe huge environmental benefits will result from farmers coming together in in other sub-catchments, like they have done in the Whangape.

- Don Harford

“Already other sub-catchments are using this experience to think about forming sub-catchments groups.

The sub-catchment groups have help remove the fear of regulation and empowered farmers towards positive environmental change.

For these reasons I am in full support of having a sub-catchment approach as an important part of PC1.”

## **2. Working within a sub catchment group - member benefits**

- Guidelines and proposed rules can be translated to individuals in a safe group setting rather than making individuals feel overwhelmed
- Easier for individuals to keep up with compliance in a group
- Individuals feel protection within a group rather than as an individual that could be picked on
- Access to high quality technical support – best mitigation options, funding options etc
- Financial incentive than allows savings to be used for improved environmental outcomes

- Getting to know your neighbours and the importance of a strong (rural) community



# 3. How sub catchment groups could work within PC1

- PC1 recognises the importance of sub catchment groups
- Difficult to include in regulation
- Complicated by boundaries larger than farm boundaries (who owns the consent)
- The following based on Rob Dragten's Proposed Revisions to Schedule 1 (June 2019)
  - Incorporating GFPs into FEPs
  - Modifying the existing framework, not redesigning

# Promoting good farming practices

At the national level, the Governance Group will promote the Good Farming Practice Principles outlined below.

## AGREED NATIONAL GOOD FARMING PRACTICE PRINCIPLES

### GENERAL PRINCIPLES

1. Identify the physical and biophysical characteristics of the farm system, assess the risk factors to water quality associated with the farm system, and manage appropriately.
2. Maintain accurate and auditable records of annual farm inputs, outputs and management practices.
3. Manage farming operations to minimise direct and indirect losses of sediment and nutrients to water, and maintain or enhance soil structure, where agronomically appropriate.

### NUTRIENTS

4. Monitor soil phosphorus levels and maintain them at or below the agronomic optimum for the farm system
5. Manage the amount and timing of fertiliser inputs, taking account of all sources of nutrients, to match plant requirements and minimise risk of losses.
6. Store and load fertiliser to minimise risk of spillage, leaching and loss into water bodies
7. Ensure equipment for spreading fertilisers is well maintained and calibrated.
8. Store, transport and distribute feed to minimise wastage, leachate and soil damage.

### WATERWAYS

9. Identify risk of overland flow of sediment and faecal bacteria on the property and implement measures to minimise transport of these to water bodies.
10. Locate and manage farm tracks, gateways, water troughs, self-feeding areas, stock camps, wallows and other sources of run-off to minimise risks to water quality.
11. Exclude stock from water bodies to the extent that is compatible with land form, stock class and stock intensity. Where exclusion is not possible, mitigate impacts on waterways.

### LAND AND SOIL

12. Manage periods of exposed soil between crops/pasture to reduce risk of erosion, overland flow and leaching.
13. Manage or retire erosion prone land to minimise soil losses through appropriate measures and practices\*
14. Select appropriate paddocks for intensive grazing, recognising and mitigating possible nutrient and sediment loss from critical source areas
15. Manage grazing to minimise losses from critical source areas.

### EFFLUENT

16. Ensure the effluent system meets industry specific Code of Practice or equivalent standard.
17. Have sufficient, suitable storage available for farm effluent and wastewater.
18. Ensure equipment for spreading effluent and other organic manures is well maintained and calibrated.
19. Apply effluent to pasture and crops at depths, rates and times to match plant requirements and minimise risk to water bodies.

### WATER AND IRRIGATION

20. Manage the amount and timing of irrigation inputs to meet plant demands and minimise risk of leaching and runoff.
21. Design, check and operate irrigation systems to minimise the amount of water needed to meet production objectives.

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*\*Implementing this principle may mean that Class 8 land is not actively farmed for arable, pastoral or commercial forestry uses as this land is generally unsuitable for these activities as described in the Land Use Capability Handbook.*

Table 2 Level of Confidence ratings for assessing individual GFP principles.

LOC Rating	Meaning
High	The CFEP concludes the farm practices likely to be consistent with the FEP objective or principle. The farmer has appropriate evidence to demonstrate their practice achieves the principle and can explain or show what/how their practices have been undertaken.
Medium	The CFEP concludes the farm practices are possibly consistent with an objective or principle. The farmer either has appropriate evidence to demonstrate their practices achieves the principle or can show what/how their practices have been undertaken.
Low	The CFEP concludes the farm practices are unlikely to be consistent with an objective or principle. The farmer cannot produce evidence to demonstrate how their practices achieve the objective or principle and cannot show what/how their practices have been undertaken, OR the farmers evidence or practice is not consistent with the relevant objective or principle.
N/A	The objective or principle is not relevant to the farming operation

Table 3 Defining Objective LOC ratings based on principle LOC ratings

Principle LOC ratings	Objective LOC rating <sup>7</sup>
All high LOC	High
Mostly high LOC, with 1 or more medium LOC	Either High or Medium LOC, depending on importance of the principle with the medium LOC rating to the objective.
Mostly high LOC, with 1 or more low LOC	Either Medium or Low LOC, depending on importance of the principle with the low LOC rating to the objective.
All medium LOC	Medium
One or more Low LOC	Low or Medium LOC depending on importance of the principle with the low LOC rating to the objective.



Table 4 Defining Overall Review Grades

Review Grade	Meaning <sup>a</sup>
A	Has received LOC ratings of "High" for all objectives.
B	Has received one or more "Medium" objective LOC ratings, no "Low" objective LOC ratings, has an appropriate action plan to improve LOC ratings, and is on track to achieve the plan
C	Has received one or more "Medium" objective LOC ratings, no "Low" objective LOC ratings, but either does not have an appropriate action plan to improve LOC ratings, or is not on-track to achieve the plan
D	One or more "Low" objective LOC ratings.

Table 1 Frequency of FEP reviews

Previous Review Grade	Interval to next review
A	3 years
B	2 years
C	1 year
D	6 months

# Farm Environment Plans

- It is likely that FEPs will be an important part of PC1
- Support Landowners preparing their own FEP
- CFEPs will approve these FEPs and other CFEPs will audit and review. FEP includes SC details
- Whether a NRP is required depends on whether the CFEP has a high Level of Confidence (LOC) on whether Nitrate is an issue on the farm or sub catchment (Baseline or review)
- Most farms in an extensively run sub catchment should therefore not need an NRP as this can be accurately estimated via inputs (stocking rate) and monitored by inputs (& water testing)

# NRP

- Regulating practices based on an NRP Overseer file can be greatly inaccurate for complex hill country farms and is a poor incentive for GFPs.
- In contrary it distracts farmers from finding working alternatives and encourages data manipulation.
- One of the many benefits of sub catchment groups is that we can test out alternatives in the field, applied over multiple properties which truly achieve a reduction in N loss, regardless of land use intensity

# Good Farming Practices (GFPs)

- Support the promotion of the 21 Good Farming Practices and using these as a base for FEPs
- Work collectively to identify those GFPs which are effective in your SC
- Support additional GFPs that will enhance the FEP for those farms that are members of Sub catchment groups – Sub catchment Objective
- This adds more weight to individual FEPs

# Sub catchment Objective GFPs

22. Actively engaged in their sub catchment group
23. Have evidence of the importance of the 4 contaminants in their sub catchment through (modelling or water testing etc) bearing in mind cumulative downstream effects
24. Have a Sub Catchment Environment Plan (SCEP)

# Review grades and Confidence ratings

(Rob Dragten Report June 2019)

- Support using a LOC rating and review grades to determine frequency of review with SC objective
- For those that score a high LOC for GFP 1 -24 (proposed), suggest an A+ grade that lengthens review interval to 5 + years (2-3 years past longest review)
- This is because WRC will be working with Sub catchments and will know if they are working towards the vision and strategy
- This will also encourage engagement and participation in sub catchments and formation of new groups



# How to encourage engagement and formation of sub catchment groups?

- One benefit will be that those that are members of a sub catchment group will enjoy longer FEP review periods (financial incentive and less hassle)
- Non compliance handled within SC first
- Also less likely to require NRP?
- Initial baseline NRP useful to estimate catchment load but unless input changes then Level of Confidence (LOC) high that N use efficient and minimised loss to waterways



# How to manage Sub catchment groups

- Suggest those not in sub catchment groups will have to abide by PC1 rules
- Those actively engaged in sub catchment groups will have some flexibility in PC1 rules to encourage and maintain engagement (eg. stock exclusion in hills)
- The sub catchment will need to have elected sub catchment leaders that will be the first point of contact with WRC
- If SC or WRC identifies an issue with a sub catchment member – they will ask sub catchment (leaders) to intervene first and allow the group to educate – peer to peer mentoring
- If Sub catchment has a member that is not willing to improve their farming practices to benefit the environment despite their best efforts, they may ask WRC to assist. They are likely to require more frequent FEP reviews



# What constitutes a sub catchment group?

- May start small, say 50% of land area but the important measure is whether the sub catchment group is increasing engagement and having a positive effect on the environment and water quality
- SC target 70% land area after 5 years?
- Realise sub catchment members will have different levels of knowledge and understanding and willingness to engage .
- However a sub catchment group is the best way of improving environmental outcomes

# What constitutes a sub catchment group?

- In order to access wider funding, the sub catchment will probably need to form an Incorporated society (or similar)
- It could be that one umbrella Inc Society is created for the purpose of funding applications, while smaller SC hubs can then operate more independently for practical matters
- These could include defining GFPs at a local scale and peer-to-peer support, knowledge sharing and monitoring

