Intensive engagement period 1 Feedback report

March - May 2015

Healthy Rivers
PLAN FOR CHANGE

Maniapoto Māori Trust Board
Raukawa Charitable Trust
Te Arawa River Iwi Trust

Wai Ora
HE RAUTAKI WHAKAPAIPAI

Tūwharetoa Māori Trust Board
Waikato Raupatu River Trust
Waikato Regional Council

Prepared by:

Janet Amey
Will Collin

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Disclaimer

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1 About this report

The purpose of this report is to present the feedback received over the first round of community engagement in March-May 2015 back to interested stakeholders and to the Collaborative Stakeholder Group (CSG).

The focus over the six week engagement period was on connecting with stakeholders via three main methods; the facilitated stakeholder workshop at Hamilton Gardens, the five community drop in sessions around the Waikato and Waipa river catchments and the online survey.

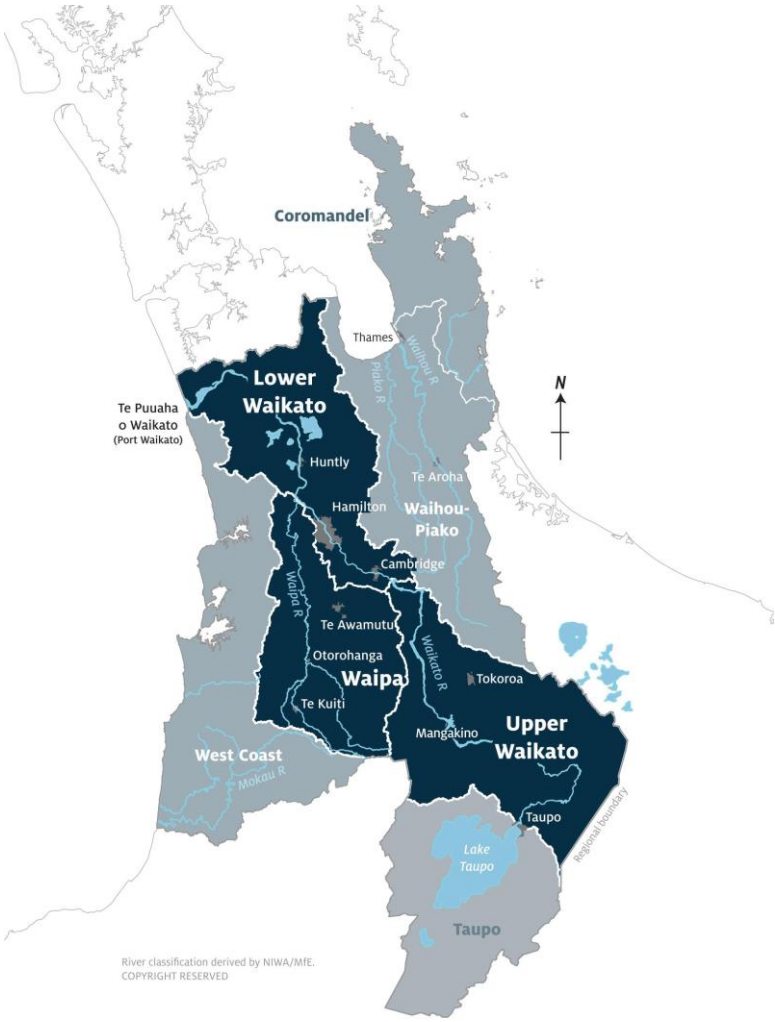
The three engagement methods focused on water quality issues and their causes and were used to update people on the project and involve them in discussion with the CSG on six key areas:

- how the CSG proposes to divide the catchment into areas to better manage water quality
- current water quality and trends in different parts of the Waipa and Waikato River catchments
- insights into factors driving water quality
- how the CSG will determine how healthy (or unhealthy) a water body is
- how the project's modelling and research programme will help develop options
- the project milestones and timelines.

Each of the above six areas provided information and posed questions for response. Some questions did differ between the stakeholder workshop, the drop in sessions and the online survey based on the method of delivery. This report presents community feedback by question posed, noting the actual question asked and of whom it was asked. Responses are shown disaggregated by group where possible with corresponding totals provided.

Many of the questions asked throughout the consultation period were open ended questions. Responses to these questions have been summarised and themed. While responses have been themed, the aim has been to present the information for discussion rather than provide in-depth analysis.

Map 1: Waikato and Waipa river catchments



2 The Healthy Rivers Wai Ora project

The Healthy Rivers: Plan for Change/Wai Ora: He Rautaki Whakapaipai project is working with stakeholders to develop changes to the Waikato Regional Plan to help restore and protect the health of the Waikato and Waipa rivers, which are key to a vibrant regional economy.

Once developed, the plan change will help, over time, to reduce sediment, bacteria and nutrients (nitrogen and phosphorus) entering water bodies (including groundwater) in the Waikato and Waipa River catchments, an area of 1.1 million hectares. Waikato and Waipa River iwi and Waikato Regional Council are partners on this project, as set out in settlement and co-management legislation for the Waikato and Waipa rivers. The project partners are Maniapoto Māori Trust Board, Raukawa Charitable Trust, Tūwharetoa Māori Trust Board, Te Arawa River Iwi Trust and Waikato Raupatu River Trust.

Why a plan change is needed

Developing a plan change:

- is legally required by the Vision and Strategy for the Waikato River/Te Ture Whaimana o Te Awa o Waikato and the Government's National Policy Statement for Freshwater Management 2014
- will tackle issues that are apparent in monitoring of the rivers, and prevent them becoming more difficult and expensive to fix
- will provide greater protection for fresh water – reviews of current Waikato Regional Council policy to protect fresh water state more protection is needed
- will help meet the expectations the Waikato and Waipa communities, iwi and industry hold for fresh water and the rivers.

Farmers, iwi, industry, environmental groups, local government and other stakeholders have already done much to address water quality, and are continuing to do so.

What the plan change will cover

It's too soon to say exactly what the proposed plan change will be, as it is being developed with stakeholders. However, it will set objectives, limits and targets for water quality in all water bodies. A limit defines the load to be placed on water quality from inputs like nutrients. A target simply puts a timeframe on achieving a limit. The plan change might also include:

- limits and targets on contaminants such as bacteria and sediment entering water directly or via land
- property-level limits and targets for nitrogen and phosphorus, either as inputs or outputs
- specific outcomes for ecological health and recreation, fisheries and mahinga kai (food gathering)
- methods such as riparian fencing and planting, to help achieve limits and targets for sediment and bacteria, and ecological health and other outcomes.

Collaborating with stakeholders

Collaboration with stakeholders and the community is key in developing the plan change and achieving lasting outcomes. The 24 member Collaborative Stakeholder Group (CSG) is the central channel for stakeholder and broader community involvement in the project. This group will:

- actively involve communities affected and understand their views
- review and deliberate on technical material on the environmental, social, cultural and economic complexities of the project
- recommend solutions to decision makers.

The CSG's first two day workshop was in March 2014 and the group continue to meet every four to six weeks.

CSG's Focus Statement

"To come up with proposed limits, timelines and practical options for managing contaminants and discharges into the Waikato and Waipa catchments to ensure our rivers and lakes are safe to swim in and take food from, support healthy biodiversity and provide for social, economic and cultural wellbeing"

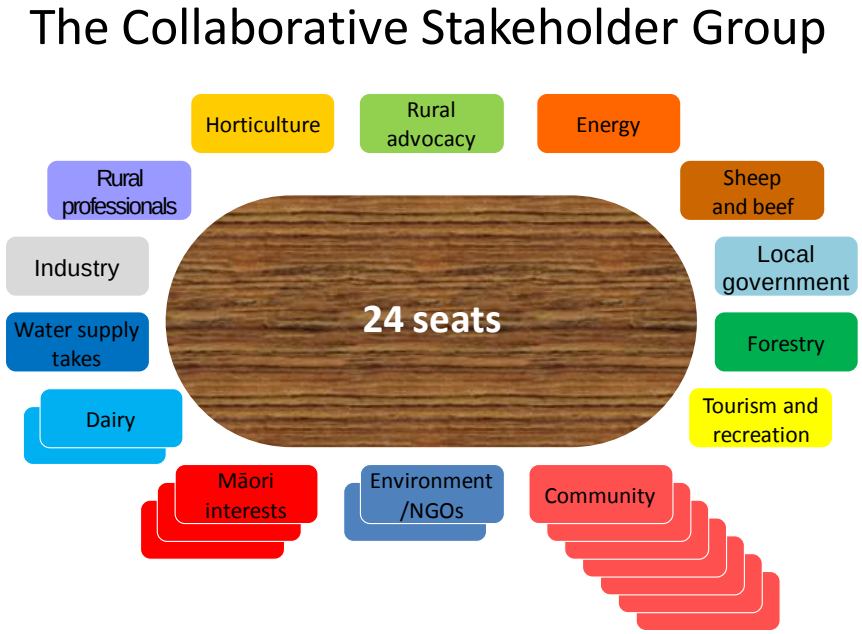
Purpose of the Collaborative Stakeholder Group (CSG)

The purpose of the CSG is to:

- bring stakeholders and the community together early to seek a common way forward
- act as the central channel for stakeholder and community involvement in the plan change process
- intensively review and understand the technical, social, cultural and economic complexity of the project
- to form recommendations to decision makers.

Figure 1: Membership of the CSG

Collaborative Stakeholder Group (CSG) Members		Delegate
Community (People living in the Waikato or Waipa river catchments)	Jason Sebestian, Brian Hanna Gayle Leaf, Evelyn Forrest Dr Gwyneth Verkerk, Liz Stolwyk, Matt Makgill	No delegates
Dairy	Dr Rick Pridmore George Moss	Charlotte Rutherford
Horticulture	Chris Keenan	Garth Wilcox
Rural advocacy	James Houghton	Paul le Miere
Energy	Stephen Colson	Rosemary Dixon
Industry	Dr Ruth Bartlett	Mike Carroll
Sheep and beef	James Bailey	Graeme Gleeson
Environment/NGOs	Al Fleming Michelle Archer	Jim Crawford Dr David Campbell
Local government	Sally Davis	Tim Harty
Tourism and recreation	Alastair Calder	Don Scarlet
Forestry	Patricia Fordyce	Sally Strang
Māori interests	Alamoti Te Pou, Weo Maag, Gina Rangi	
Water supply takes	Garry Maskill	Ilze Gotelli
Rural professionals	Phil Journeaux	



3 Summary of engagement events

The first Healthy Rivers Wai Ora community engagement period for 2015 ran from 25 March to 5 May. The focus over the six week period was on consulting with stakeholders via three main methods; the facilitated stakeholder workshop at Hamilton gardens, the five community drop in sessions around the catchment and the online survey.

The three engagement methods focused on water quality issues and their causes and were used to update stakeholders on the project and involve them in discussion with the CSG on six key areas:

- how the CSG proposes to divide the catchment into areas to better manage water quality
- current water quality and trends in different parts of the Waipa and Waikato river catchments
- insights into factors driving water quality
- how we will determine how healthy (or unhealthy) a water body is
- how the project's modelling and research programme will help develop options
- the project milestones and timelines.

Table 1: Number attending each engagement event

Engagement event	Attendance / Responses
Stakeholder Workshop	132
Upper Waikato drop in session	18
Middle Waikato drop in session	35
Lower Waikato – Huntly drop in	20
Lower Waikato – Tuakau drop in	26
Waipa drop in	34
Online survey*	241
Total*	506

* the total will include some people attending more than one engagement event

Engagement events

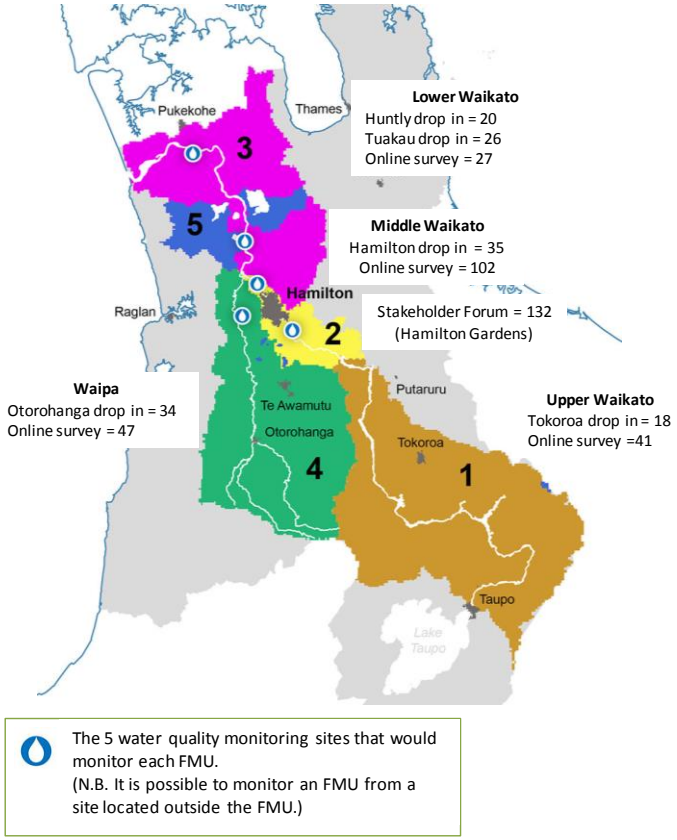
The CSG wanted to ensure as many stakeholders as possible could have their say over the six week engagement period.

Engagement opportunities were publicised in a variety of ways, including via:

- The Healthy Rivers Wai Ora online newsletter (500+ subscribers)
- Email from CSG members to their respective sector networks
- The Healthy Rivers Wai Ora Committee
- Local newspaper advertisements around the catchment
- A stand at the Waikato Environment Expo (Waikato Winter Show)
- The Waikato Regional Council (WRC) Facebook page
- The WRC website

Map 2 shows a summary of the numbers attending events or responding to the survey based on geographic location, and shown by the proposed Freshwater Management Unit (FMU). Those answering the online survey have been placed into the FMU which they identified they live in (note that 27 people identified that they lived in more than one FMU).

Map 2: CSG Stakeholder Engagement March-May 2015



CSG's preferred FMU option

1 Upper Waikato
Huka Falls to above Karapiro

2 Middle Waikato
Karapiro to Ngaruawahia

3 Lower Waikato
Ngaruawahia to Port Waikato

4 Waipa
Waipa River Catchment

5 Shallow lakes
Selected lowland lakes nested within their local catchment

What is an FMU?

FMU stands for Freshwater Management Unit. FMUs are areas that the catchment is divided into for setting freshwater objectives and limits and for freshwater accounting and management purposes.

Under the National Policy Statement for Freshwater Management (NPS-FM) identifying FMUs is a requirement. For each FMU the plan change must:

- set objectives and limits for water quality
- identify values
- describe current state and anticipated future state
- establish and operate a freshwater accounting system.

Beyond these requirements nothing in the NPS-FM restricts having the same objective(s) for different FMUs. Also policies and methods may differ between FMUs and for different areas within an FMU.

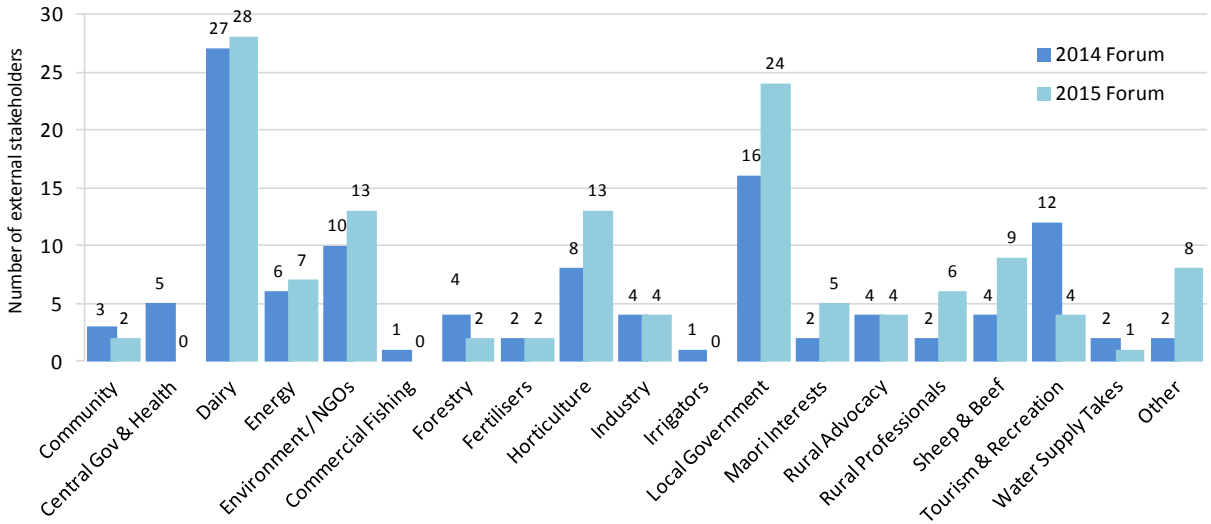
a) The stakeholder workshop on 25 March

In total 132 external stakeholders attended the workshop (excluding WRC project staff, TRH, TLG and HRWO councillors and river iwi governors). This was the second workshop, with the first being held in October 2014. Table 2 shows the number of external workshop attendees by gender, age group and ethnic group. Figure 2 shows the number attending the workshop in October 2014 and March 2015 by the sector they were affiliated with (self reported during online registration or when registering on the day).

Table 2: Stakeholder workshop attendees

Demographic information		Stakeholder workshop	
		Number	Percent
Gender	Male	92	69.7
	Female	40	30.3
	Did not answer	-	-
Age Group	<19 years	-	-
	19-24 years	1	0.8
	25-44 years	36	27.3
	45-64 years	39	29.5
	65+ years	10	7.6
	Did not answer	46	34.8
Ethnic Group	Māori	5	3.8
	NZ Euro/European	75	56.8
	Pacific Island	1	0.8
	Asian	1	0.8
	New Zealander	2	1.5
	Other	5	3.8
	Did not answer	43	32.6

Figure 2: Stakeholder attendance October 2014 and March 2015 workshops



b) Community drop in sessions during April & May

- Tokoroa on April 1 where 18 community members attended
- Huntly on 9 April with 20 attending
- Hamilton on 13 April with 35 attending
- Otorohanga on 15 April with 34 attending
- Tuakau on 5 May with 26 attending.

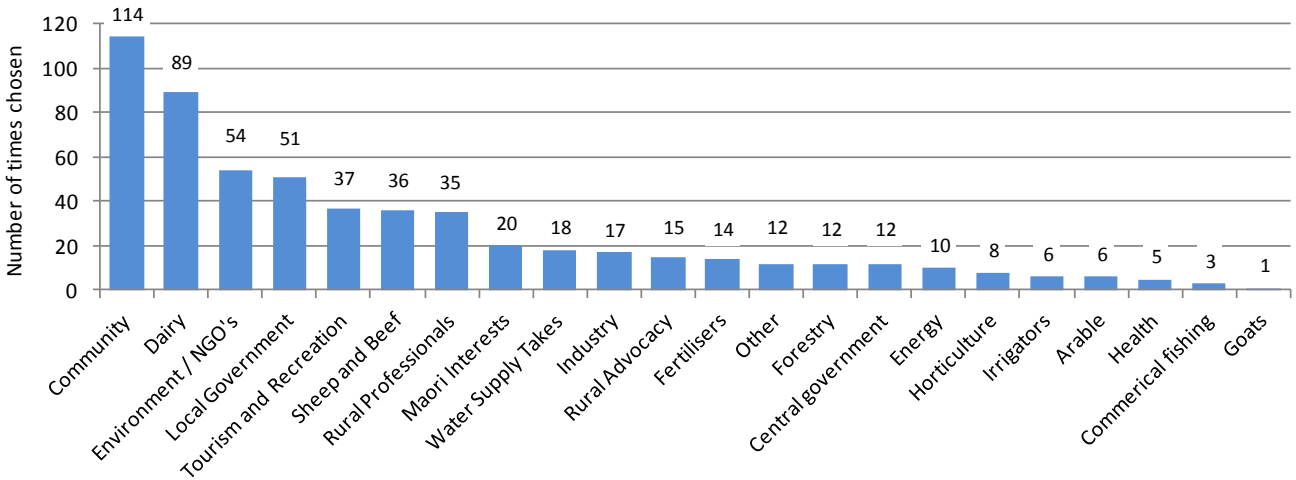
c) Online survey

Like the stakeholder workshop and drop in sessions the online survey was based on the six key areas (listed above). The survey ran from 30 March to 30 April. Following checks there are a total of 241 useable surveys (out of a total of 262, see table 3 for respondent information). The online survey asked respondents to indicate the sectors they were affiliated with. Figure 3 shows that the 241 respondents reported 591 sectors of affiliation (average 2.5 options each respondent).

Table 3: Online survey respondent information

Demographic information		Online survey	
		Number	Percent
Gender	Male	147	60.9
	Female	88	36.5
	Did not answer	6	2.5
Age Group	<19 years	1	0.4
	19-24 years	1	0.4
	25-44 years	80	33.2
	45-59 years	103	42.7
	60+ years	54	22.4
	Did not answer	2	0.8
Ethnic Group	Māori	19	7.9
	NZ Euro/European	152	63.1
	Pacific Island	-	-
	Asian	2	0.8
	New Zealander	51	21.2
	Other	5	2.1
	Did not answer	12	4.9

Figure 3: Sector representation in the online survey



4 Which proposed FMU area do you live in?

This question was asked of stakeholders via the:

- Online survey

Respondents were asked two questions. Firstly, "which proposed FMY area do you live in?" and secondly to "identify the proposed FMUs you have an individual or organisational interest in". Results are shown in table 4. Multiple responses were allowed for both questions, for example in the first question there may have been respondents with a farm crossing two proposed FMUs or people with multiple residences in different FMUs. In summary:

- 241 people provided 268 responses to "which proposed FMU area do you live in?" 27 people indicated they lived in more than one of the proposed FMU areas
- 42 of the 241 respondents indicated they live outside of the catchment area
- Only 1 respondent could not tell from the map which FMU area they lived in
- 102 people indicated they were resident in the Middle Waikato FMU
- 47 people indicated they reside in the Waipa FMU
- 41 reside in the Upper Waikato
- 27 reside in the lower Waikato
- 8 people indicated they lived in the area covered by the Shallow Lakes FMU area

Table 4: FMU of residence and FMUs of interest to survey respondents

Proposed FMU area	**I live in this FMU**	**I have a personal or organisational interest in....**				
		Upper Waikato	**Middle Waikato**	**Lower Waikato**	**Waipa**	**Shallow Lakes**
Upper Waikato	41	39	15	7	10	6
Middle Waikato	102	53	91	49	58	45
Lower Waikato	27	13	17	26	13	14
Waipa	47	17	20	12	43	15
Shallow Lakes	8	3	4	5	4	7
I do not live in any of the FMUs	42	24	22	22	21	18
I can't tell from the map	1	1	1	1	1	0
Total	*268**	*150*	*170*	*122*	*150*	*105*

* 27 respondents indicated they lived in more than one of the proposed FMUs.

5 What are your views about dividing the catchment up this way?

This question was asked of stakeholders at the:

- Stakeholder workshop
- Upper Waikato drop in session (Tokoroa)
- Middle Waikato drop in session (Hamilton)
- Lower Waikato drop in sessions (Huntly and Tuakau)
- Waipa drop in session (Otorohanga)
- Online survey

This question was aimed at eliciting the views of stakeholders on the CSG's preferred FMU option. This was one of two questions that were specifically aimed at achieving Objective E of the CSG's Community Engagement Plan – "Test the CSG's Freshwater Management Units (FMUs) option and selected attributes".

5.1 Question summary – stakeholder workshop and drop in sessions

This was the first question at the stakeholder workshop and the drop in sessions and resulted in 153 comments from these fora. These comments can be categorised into four; comments in support, comments opposed, questions and statements that are not necessarily in support or opposition. Within each category the comments have been themed and can be found in tables 6-9 below. A number of the comments in answer to this question fall into the statements category (where it is not possible to say if they are in support or in opposition to the FMU option). A number of comments are also not related to FMUs at all. As this question was the first question that was asked at both the stakeholder workshop and the drop-in sessions, stakeholders possibly used this question to unload some of their thoughts about a range of issues. Hence responses to this question include a range of 'non-FMU related responses'.

5.2 Question summary – online survey

This was question 7 of the online survey. Survey participants were asked "What are your views on dividing the catchment up this way?" and given 3 exclusive options; 'I like it', 'I don't like it' and 'I don't have any particular view'. These results are shown in the table and graph below. There was also a comment box for this question which resulted in 56 comments. These comments have been themed in tables 6-9 below.

Table 5: Survey respondents view on the proposed FMU division

Ranking option	Responses	Percent
I like it	109	45%
I don't like it	31	13%
I don't have any particular view	92	38%
Did not answer	9	4%
Total responses	241	100%

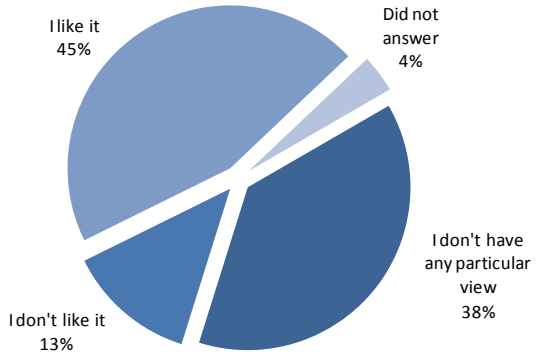


Table 6: Themed comments in support of the proposed FMU option

Comments in support of FMU option								Total comments in support = 49
Emerging theme	**Theme counts**							
	Stakeholder workshop	Upper Waikato drop in	Middle Waikato drop in	Lower Waikato drop in - Huntly	Lower Waikato drop in - Tuakau	Waipa drop in	Online survey	**Total**
Makes sense, logical, sensible, well divided	10	1	4	2	2	-	4	**23**
Happy, ok, no problem with the approach	3	-	1	1	-	4	3	**12**
Useful to recognise different issues in different places, helpful to view it this way	2	-	1	-	-	-	3	**6**
Matches existing boundaries (zone, project watershed, ecological district boundaries etc)	3	-	-	-	-	-	2	**5**
Good systematic approach	-	1	-	-	-	-	-	**1**
Good way to start, but be open to change	-	-	-	-	-	1	-	**1**
Good way to encourage better management	-	-	-	-	-	-	1	**1**
Totals	**18**	**2**	**6**	**3**	**2**	**5**	**13**	**49**

Table 7: Themed comments opposed to the proposed FMU option

Comments opposed to the FMU option								Total comments opposed = 27
Emerging theme	**Theme counts**							
	Stakeholder workshop	Upper Waikato drop in	Middle Waikato drop in	Lower Waikato drop in - Huntly	Lower Waikato drop in - Tuakau	Waipa drop in	Online survey	**Total**
FMUs are too large, need to split FMUs into smaller FMUs	4	-	-	-	-	-	7	**11**
Need greater consideration of differences in soil types within and between FMUs	1	-	-	-	-	-	3	**4**
Need to recognise different drivers/issues within FMUs, approach is too simplistic, impractical	-	-	1	-	-	-	2	**3**
Issues with the boundaries	-	-	-	1	-	-	2	**3**
Shouldn't be divided up	-	-	-	-	-	-	2	**2**
Should divide by water quality, e.g. pristine vs not pristine	1	-	-	-	-	-	-	**1**
Have less FMUs	1	-	-	-	-	-	-	**1**
Communities with the proposed FMUs do not identify with other communities in those FMUs	1	-	-	-	-	-	-	**1**
Need greater consideration for differences in hydrogeology	-	-	-	-	-	-	1	**1**
Totals	**8**	**0**	**1**	**1**	**0**	**0**	**17**	**27**

From the comments that were opposed to the FMU option, some offered specific alternative solutions. These are listed below in no particular order:

- Upper should be split between pumice and ash soils
- Upper too big. Divide at Waipapa Dam – Central Plateau and below.
- Upper divided at Waipapa. Divide pristine and not pristine
- Waikato should be 1 FMU and Waipa 1 FMU
- Include Rotongaro in Lakes FMU
- Have an Upper Waipa FMU above Otorohanga
- Should have an FMU for groundwater
- Should be an Upper and a Lower Waipa (*3 different stakeholders suggested this idea*)
- Central Plateau (Waipapa Dam) should be separate FMU

Table 8: Themed questions regarding the proposed FMU option

Questions								Total questions = 47
Emerging theme	**Theme counts**							
	Stakeholder workshop	Upper Waikato drop in	Middle Waikato drop in	Lower Waikato drop in - Huntly	Lower Waikato drop in - Tuakau	Waipa drop in	Online survey	**Total**
Questions about the monitoring sites, incl confusion about their only being the 5 sites shown on the FMU map	8	-	-	-	2	-	-	**10**
Questions about the consequences of choosing one FMU option over another, incl unintended consequences	3	-	-	-	-	-	3	**6**
Are the FMUs a good size for effective management/implementation or will it be confusing?	3	-	-	-	-	-	2	**5**
Questions about FMU boundaries or why some things are left out of FMUs, incl why are some lakes left out of the lakes FMU?	5	-	-	1	-	-	-	**5**
Questions regarding taking into account aquifers/groundwater	3	-	-	-	-	-	1	**4**
Questions about urban vs rural requirements/issues	4	-	-	-	-	-	-	**4**
Do scientific aspects change between FMUs, e.g. soil types?	3	-	-	-	-	-	-	**3**
Questions about what factors have been considered when selecting the FMU option	2	-	-	-	-	-	1	**3**
Do social aspects change between FMUs, e.g. values?	1	-	-	-	-	-	1	**2**
Questions regarding Taupo	1	-	-	-	-	-	1	**2**
Will there be a focus on a particular FMU or parts of an FMU?	2	-	-	-	-	-	-	**2**
Questions about why FMUs are in their current condition	1	-	-	-	-	-	-	**1**
Totals	**36**	**0**	**0**	**1**	**2**	**0**	**9**	**47**

Table 9: Themed statements not necessarily supporting or opposed to the proposed FMU option

Statements not necessarily supporting or opposed (incl non-FMU related responses)	Total statements = 86							
Emerging theme	**Theme counts**							
	Stakeholder workshop	Upper Waikato drop in	Middle Waikato drop in	Lower Waikato drop in - Huntly	Lower Waikato drop in - Tuakau	Waipa drop in	Online survey	**Total**
Non-FMU related responses	11	-	-	4	-	2	2	**19**
Need to keep in mind the whole system/catchment and everyone needs to contribute to water quality improvement	6	-	-	-	-	-	8	**14**
Use sub catchments and have priorities within each FMU, incl having regard for local issues and the differences between tribs and the main stem	10	1	-	-	-	-	3	**14**
Statements regarding facts about FMUs, e.g. a given policy could cover all FMUs or only 1, water quality can vary within an FMU	10	-	-	-	-	1	2	**13**
Statements regarding FMUs shouldn't be able to have unfair impacts on other FMUs, incl needing to take upstream effects on receiving environments into account	7	-	-	-	-	-	4	**11**
Statements regarding monitoring	8	-	-	-	-	-	-	**8**
People/communities/groups need to work together	2	-	-	-	-	-	-	**2**
There should be different rules/policies for different parts of the catchment	1	-	-	-	-	-	1	**2**
Not enough information to have a view	-	-	-	-	-	-	2	**2**
Statements regarding groundwater/aquifers	1	-	-	-	-	-	-	**1**
Totals	**56**	**1**	**0**	**4**	**0**	**3**	**22**	**86**

6 How do you use the water bodies in this FMU?

This question was asked of stakeholders at the:

- Stakeholder workshop
- Upper Waikato drop in session (Tokoroa)
- Middle Waikato drop in session (Hamilton)
- Lower Waikato drop in sessions (Huntly and Tuakau)
- Waipa drop in session (Otorohanga)
- Online survey

At the stakeholder workshop an information station was set up for each proposed FMU. These stations were available for people to peruse. At each station, tally sheets asking "how do you use the water bodies in this FMU" were available. The set up was similar at the 5 drop in sessions, with information on that FMU and the same tally sheet as used at the stakeholder workshop. People could also indicate other uses, outside of the given options. This information is shown in table 10 below. The question was also asked in the online survey and results are presented in table 11.

Table 10: Use of water bodies: information from the stakeholder workshop and drop in sessions

Uses	Particular use counts by engagement workshop											
	Stakeholder workshop					Drop in sessions ** Shallow Lakes information collected at Huntly & Tuakau*						Total
	Upper Waikato	Middle Waikato	Lower Waikato	Waipa	Shallow Lakes	Upper Waikato	Middle Waikato	Lower Waikato Huntly	Lower Waikato Tuakau	Waipa	*Shallow Lakes	
Walking or cycling beside it	20	17	10	6	9	6	13	7	4	6	4	102
Sightseeing, picnicking or camping	20	11	7	7	7	4	7	5	6	7	2	83
Fishing or hunting	16	4	4	7	5	2	1	6	4	7	4	60
Boating or water sports	16	7	6	5	1	5	4	4	1	5	3	57
Kayaking, canoeing, waka ama	13	10	2	5	6	2	6	3	2	5	1	55
Swimming	18	5	2	8	1	4	4	-	4	8	-	54
Taking water for farm or horticultural use	4	2	8	6	1	1	1	-	2	6	-	31
Water supply for domestic or municipal use	2	7	3	4	1	-	-	2	1	4	-	24
Gathering kai	4	2	1	1	4	2	-	2	2	1	-	19
Electricity generation	5	1	4	1	2	-	-	1	1	1	-	16
Other	2	1	1	-	3	-	1	2	1	-	-	11
Commercial & industrial use	-	-	2	-	1	-	1	1	1	-	1	7

Other included: spiritual value (Huntly x2), appreciating the native aquatic native species (Tuakau), value of the fauna (middle Waikato x1), view from road (stakeholder workshop – Upper x1), pet exercise (stakeholder workshop – middle x1), biodiversity restoration (stakeholder workshop – Waipa x1 & shallow lakes x1), restoring natural ecosystems (stakeholder workshop – shallow lakes x1).

Table 11 shows information on how people responding to the online survey indicated they used various water bodies. As survey responders could be located anywhere across the catchment (or outside of it, as 17% of all responders were), they were asked to identify a body of water they knew well. Those answers were then placed into the appropriate FMU area. Some responses could not be coded into an FMU and are shown as “Waikato river” or “Waikato and Waipa river”.

Table 11: Use of water bodies: information from the online survey

Uses	Particular use counts by FMU location of identified water body							
	Upper Waikato	Middle Waikato	Lower Waikato	Waipa	Shallow Lakes	Waikato River	Waikato & Waipa River	Total
Walking or cycling beside it	16	38	9	23	11	38	2	137
Sightseeing, picnicking or camping	8	28	6	17	5	32	3	99
Swimming	12	19	3	17	4	20	1	76
Boating or water sports	18	22	3	5	6	21	-	75
Fishing or hunting	12	5	4	18	5	10	1	55
Kayaking, canoeing, waka ama	5	11	4	5	2	21	-	48
Water supply for domestic or municipal use	2	3	4	3	1	8	1	22
Other*	2	5	3	3	6	3	-	22
Electricity generation	2	6	1	-	1	4	1	15
Taking water for farm or horticultural use	3	1	1	3	1	4	-	13
Gathering kai	-	-	1	3	1	2	-	7
Commercial and industrial use	1	1	1	1	1	2	-	7

Other uses included living or farming alongside the river (x6), ‘drink it’ (x2), involvement in monitoring, planning and/or restoration activities (x7) and waste water discharge and takes from it (x1).

Combining the survey, stakeholder workshop and drop in session information on water use shows the following top six uses:

- 239: walking or cycling beside
- 182: sightseeing, picnicking or camping
- 132: boating or water sports
- 130: swimming
- 115: fishing or hunting
- 103: kayaking, canoeing or waka ama

7 How would you rate the current water quality of this water body generally?

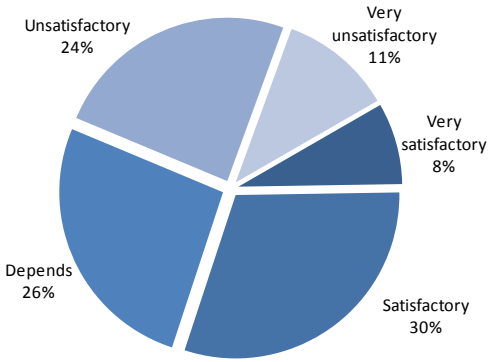
This question was asked of stakeholders via the:

- Online survey

This question was only asked of online survey respondents. People were first asked to identify a body of water (via a free text field) anywhere in the catchment that they knew well. This approach was taken in order to help respondents answer several specific questions as well as make the information given more useful for analysis. So, after respondents had identified their water body they were asked "how would you rate the current quality of this water body generally?" Table 12 shows the responses to this question by the proposed FMU that the identified water body was coded into. In total 202 responses were recorded, with 15 of those being 'out of scope', that is, outside of the catchment or where a rating was given but no water body had been specified.

Table 12: Current water quality rating: online survey respondents

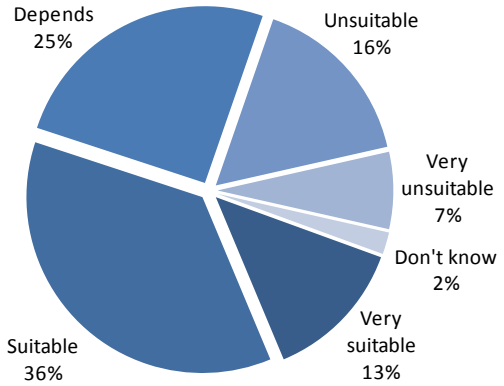
Identified water body is in the...	Current quality of the water body....					
	Very satisfactory	Satisfactory	Depends	Unsatisfactory	Very unsatisfactory	Total
Upper Waikato	7	8	7	3	1	26
Middle Waikato	1	16	12	15	4	48
Lower Waikato	1	4	6	3	2	16
Waipa	6	11	7	7	4	35
Shallow Lakes	-	1	2	6	6	15
"Waikato river"	2	12	16	9	5	44
"Waikato and Waipa river"	-	1	1	1	-	3
No water body selected or out of scope	-	7	2	5	1	15
Overall	17 (8%)	60 (30%)	53 (26%)	49 (24%)	23 (11%)	202



The next question followed on from "how would you rate the current quality of this water body generally?" in asking survey respondents to rate the waters suitability (in terms of quality) for what they actually use the water body for. The question was "think about the current quality of the water body you know well. Is the water quality suitable for what you use it for?" Results are shown in table 13.

Table 13: Current water quality suitability for use: online survey respondents

Identified water body is in the...	Suitability for use						
	Very suitable	Suitable	Depends	Unsuitable	Very unsuitable	Don't know	Total
Upper Waikato	9	8	6	3	-	-	26
Middle Waikato	6	16	14	9	1	1	47
Lower Waikato	1	6	4	4	2	1	18
Waipa	7	13	7	5	3	-	35
Shallow Lakes	-	5	1	3	7	-	16
"Waikato river"	3	19	15	6	1	1	45
"Waikato & Waipa"	-	1	1	-	-	-	2
No water body selected or out of scope	1	6	4	2	1	2	16
Total	27 (13%)	74 (36%)	52 (25%)	32 (16%)	15 (7%)	5 (2%)	205



Survey respondents were then asked "why did you give this rating"? In total, people provided 138 comments as to why they gave the rating in table 13. These comments have been themed, combining the reasons giving for 'very suitable' with 'suitable' and then 'very unsuitable' with 'unsuitable'. The comments given for 'depends' are shown also (tables 14-16).

Table 14: Water suitability for use; themes 'suitable' and 'very suitable'

Comment themes: 'suitable' & 'very suitable' Total comments = 63	
Emerging theme	**Theme Count**
It appears clean, good in general, good clarity, seems fit for purpose, suitable for requirements	**22**
Have never suffered ill effects from getting in, fine for swimming, kayaking, skiing, boating	**16**
Been tested ok for human consumption, good for drinking, grows good puha/food	**6**
Since I don't get in it's fine	**4**
Would like to see lower levels of contaminants, good now but concerned for future	**4**
Enjoyment of the scenic environment, walking	**3**
Hydro generation is not affected, okay for industrial purposes, ok for crop irrigation	**3**
Is better than used to be, dairy shed waste no longer goes in	**2**
I can see lots of fish, trout are evident	**2**
Balance - would accept less quality if community was better off economically	**1**

Table 15: Water suitability for use; themes ‘unsuitable’ and ‘very unsuitable’

Comment themes: ‘unsuitable’ & ‘very unsuitable’	Total comments = 40
Emerging theme	**Theme Count**
Can’t swim in it, can’t harvest food from it, would get sick if swam, not safe for recreational contact, public health warnings	**16**
Has high level of contaminants, high arsenic levels, high E.coli, cyanobacteria , algae blooms	**7**
Barren river indicates unsuitable conditions, visual evidence, stinky, unappealing	**6**
Koi carp infestation and damage, few non-pest fish, introduced pest fish	**4**
Swim or kayak now as have little choice, not the quality I want	**2**
Everything washes into it in winter	**1**
Not suitable for anything but could be a valuable part of Whangamarino wetland if not polluted	**1**
The lakes are not suitable (apart from Taupo)	**1**
Can no longer use it for flood irrigation	**1**
The more I have learnt about it the less I use it	**1**

Table 16: Water suitability for use; themes from ‘depends’

Comment themes: ‘depends’	Total statements = 35
Emerging theme	**Theme Count**
Parts of the river are good or okay where others are not suitable for use	**5**
Weedy, depends on extent of the weed, boats don’t appreciate the weed, weed not safe for swimming	**4**
Can use it now but not sure of the future, treatment costs in the future may be high	**3**
Depends on the use	**3**
Occasional algae blooms detract from recreational or personal use	**3**
Varies at different times of the year, after high rainfall, only use in summer	**2**
Bacteria levels can be high, not want to swallow it if fell in	**2**
Not sure if it is safe or not for swimming, use it but not sure if safe to put head under	**2**
Need to improve clarity and odour, is unattractive	**2**
Could be better, depends on the balance of all uses	**2**
Trends are towards a reduction in water quality	**2**
I don’t get in it	**2**
Flooding can affect use of the paths	**1**
Ok to consume because of treatment but not safe for recreational use	**1**
Trout are an indicator of quality and not many in lower river	**1**
	35

8 How clear would you <u>like</u> the water to be when you get in?

This question was asked of stakeholders via the:

- Online survey

This question was aimed at finding out stakeholder views on water clarity. In particular this question was aimed at finding what the desired state would be for stakeholders in relation to water clarity and swimming. This question links with the section below and a comparison between the two questions is included at the end.

8.1 Question summary – online survey

This question was in the online survey but wasn't asked at either the stakeholder workshop or any of the drop in sessions. Survey participants were asked the following question; "Imagine you want to swim in the water. How clear would you <u>LIKE</u> the water to be when you get in?" Survey participants could choose between 6 different exclusive options and these are set out in table 17 below. In a previous survey question, participants were asked to identify a water body they knew well. The answers to this question have been set out by grouping the water bodies participants identified into our FMU groups (plus the main rivers) and displaying the answers by these groups. Some participants identified water bodies they knew well that are outside the Waikato and Waipa river catchments. These have been included in a separate column below. A weighted average row (where "I would have to see further ..." is '1' etc) has also been included for comparison purposes.

Table 17: How clear would you like the water to be: online survey respondents

Response option	Upper Waikato	Middle Waikato	Lower Waikato	Waipa	Shallow Lakes	'Waikato River'	'Waikato & Waipa River'	No selection / out of scope	Total
I would have to see further than neck to toes	3	18	2	13	6	12	-	7	**61**
I can see from my neck to my toes	7	11	8	8	3	14	1	2	**54**
I can see from my waist to my toes	8	14	4	11	4	13	1	6	**61**
I can see from my knees to my toes	5	3	3	1	1	5	1	1	**20**
I don't mind how murky it is	2	-	-	2	2	-	-	1	**7**
I don't know	1	1	-	-	-	1	-	1	**4**
Did not answer	-	1	1	-	-	-	-	32	**34**
Total	**26**	**48**	**18**	**35**	**16**	**45**	**3**	**50**	**241**
Weighted Average	*2.84*	*2.04*	*2.47*	*2.17*	*2.38*	*2.25*	*3.00*	*2.24*	***2.30***

9 How clear does the water <u>have</u> to be before you would get in?

This question was aimed at finding out stakeholder views on water clarity. In particular this question was aimed at finding what the 'bottom line' would be for stakeholders in relation to water clarity and swimming. This question links with section 9 above and a comparison between the two questions is included at the end of this section.

This question was asked of stakeholders at the:

- Stakeholder workshop
- Upper Waikato drop in session (Tokoroa)
- Middle Waikato drop in session (Hamilton)
- Lower Waikato drop in sessions (Huntly and Tuakau)
- Waipa drop in session (Otorohanga)
- Online survey

9.1 Question summary – stakeholder workshop and drop in sessions ('murky man picture')

This question was asked in both the online survey and at the stakeholder workshop/drop in sessions. At the stakeholder workshop and drop in sessions, stakeholders were asked "How clear does the water have to be before you would get in?" Answers to this question were gathered primarily with a picture (see image 1) that had tally boxes next to 5 different options. Stakeholders also had the opportunity to provide additional comments at these fora. Tally box answers to this question can be found in table 18, and the additional comment themes can be found in table 19.

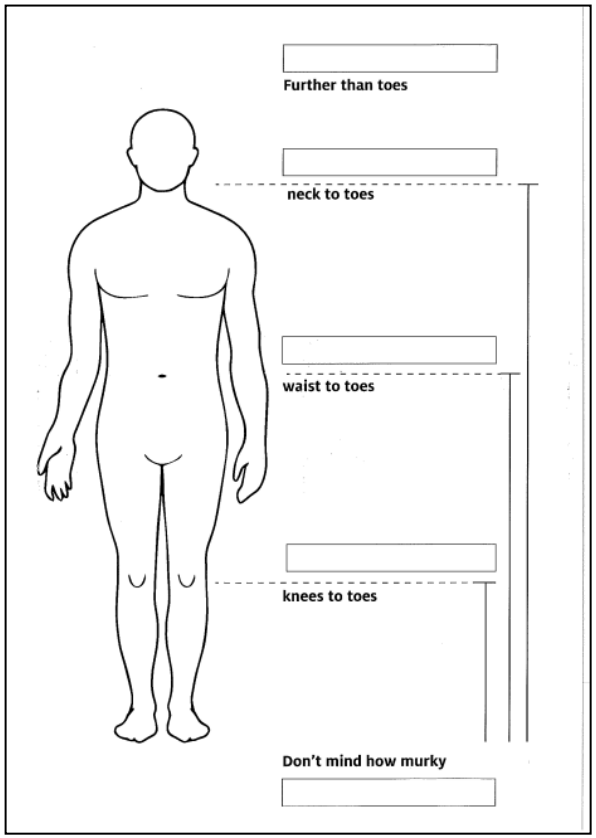


Image 1: 'Murky man picture'

9.2 Question summary – online survey

Survey participants were asked the following question; "Again, imagine you wanted to swim in the water. How clear would the water <u>HAVE</u> to be before you would get in?" Survey participants could choose between 6 different exclusive options and these are set out in table 18 below. Unlike section 9, answers to this question have not been set out by the water bodies participants had identified. This allows for comparisons between the survey and the drop in sessions, an overall comparison within the survey and an overall comparison between all fora; but not a comparison between different FMUs within the survey data. A weighted average column (where "I would have to see further ..." is '1' etc) has also been included for comparison purposes.

Table 18: How clear does the water have to be before you would get in: all responses

	See further than neck to toes	See from my neck to my toes	See from my waist to my toes	See from my knees to my toes	I don't mind how murky it is	I don't know	No response	Total	*Weighted Average*
Stakeholder workshop	11	23	46	30	4	0	-	**114**	*2.94*
Upper Waikato drop in	-	1	4	2	1	0	-	**8**	*3.38*
Middle Waikato drop in	-	1	4	3	0	0	-	**8**	*3.25*
Lower Waikato – Huntly drop in	-	2	4	2	0	0	-	**8**	*3.00*
Lower Waikato – Tuakau drop in	-	1	3	1	1	0	-	**6**	*3.33*
Waipa – Otorohanga drop in	-	2	6	1	2	0	-	**11**	*3.27*
Online survey	20	32	73	59	16	7	34	**241**	*3.10*
Total	**31**	**62**	**140**	**98**	**24**	**7**	**34**	**396**	***3.06***

Table 19: How clear does the water have to be before you would get in: comment themes (all responses)

Emerging theme	**Theme counts**						
	Stakeholder workshop	**Upper Waikato drop in**	**Middle Waikato drop in**	**Lower Waikato drop in - Huntly**	**Lower Waikato drop in - Tuakau**	**Waipa drop in**	**Total**
It depends ... *(includes saying the answer would depend on: whether the water is flowing or not, if there had been a recent weather event, if we are talking about tribs or the main stem, what you are doing in the water, local knowledge etc)*	23	-	-	-	-	-	**23**
Problem with or unclear about the question or approach	13	-	-	-	-	-	**13**
Clarity not the defining factor in swimming *(some responses included reference to other attributes such as E.coli)*	10	-	-	-	-	-	**10**
Emphasising the importance of safety *(e.g. being able to identify hazards)*	5	-	-	-	-	-	**5**
Other *(includes: important to know and consider tradeoffs, is the root cause being addressed,*	3	-	-	-	1	-	**4**

should relate to turbidity not to sediment)							
Wouldn't swim regardless of clarity *(e.g. due to temperature)*	3	-	-	-	-	-	**3**
Ecosystem health aspects	2	-	-	-	-	-	**2**
Important not to put your head under the water	-	-	-	-	2	-	**2**
Children don't understand the dangers	-	-	-	-	1	-	**1**
Total	**59**	**0**	**0**	**0**	**4**	**0**	**63**

The comments for this question highlight that stakeholders recognise that there are other considerations, apart from water clarity, that also are important to consider in relation to 'swimmability'. This has also been recognised by the CSG and TLG as water clarity is one of three attributes for the 'swimmability' value (the others being *E.coli* and planktonic cyanobacteria). The comments also highlight that whether or not people will swim in a water body depends on multiple factors outside of our attributes, such as local knowledge of a water body.

9.3 Comparison between sections 8 ('like' question') and 9 ('have' question')

The difference between what level of water clarity stakeholders would <u>like</u> to have for swimming and what level of water clarity would <u>have</u> to be for swimming are highlighted when comparing these two questions. As expected, the weighted averages for the 'like' question are lower across all FMUs when compared to the 'have' question, indicating that most stakeholders would like water clarity to be higher than their minimum 'have to be' level for swimming.

The total weighted average for the 'have to be' question is 3.06 (2dp). This is very close to the 'waist to toes' option. The total weighted average for the 'like to be' question is 2.30 (2dp). This is closest to the 'neck to toes' option.

This question was asked of stakeholders at the:

- Stakeholder workshop
- Middle Waikato drop in session (Hamilton)
- Lower Waikato drop in sessions (Huntly and Tuakau)
- Waipa drop in session (Otorohanga)

10 What do you think about the water quality in this part of the catchment and why?

At the stakeholder workshop an information station was set up for each proposed FMU. These stations were available for people to peruse. At each station, there was paper for people to record their response to this question[1].The set up was similar at the five drop in sessions, with information on that FMU and the same question sheet as used at the stakeholder workshop.

Table 20: What do you think about water quality in this part of the catchment

Emerging theme	What do you think about the current water quality in this part of the catchment?											
	Stakeholder workshop					Drop in sessions ** Shallow Lakes information collected at Huntly & Tuakau*						Total
	Upper Waikato	Middle Waikato	Lower Waikato	Waipa	Shallow Lakes	Upper Waikato	Middle Waikato	Lower Waikato Huntly	Lower Waikato Tuakau	Waipa	*Shallow Lakes	
Visually unappealing, odour, rubbish, weed , embarrassing situation, accumulation of issues	4	3	2	1	1	-	2	-	-	1	1	15
There are very serious problems (high E.coli, poor recreational use, koi carp, geese, swans etc)	-	2	4	1	3	-	-	-	1	-	1	12
It is poor, deteriorating, needs improvement	2	-	-	2	-	-	4	-	-	-	-	8
Good , but the impacts of cumulative effects of nutrients, conversions, intensification are of concern	3	1	-	2	-	-	1	1	-	-	-	8
Poor visibility, murky, clarity issues, visibility issues especially after heavy rain events	1	-	-	2	-	-	1	-	2	2	-	8
Water quality and quantity varies a lot, seasonal differences in quality	3	2	-	2	-	-	-	-	-	-	-	7
There is not enough monitoring, need to know clearly where the issues come from	1	1	2	-	2	-	1	-	-	-	-	7
It is excellent / good / okay	3	-	-	3	-	-	-	-	-	-	-	6
The soil type contributes to sediment issues (land use)	-	1	-	3	2	-	-	-	-	-		6
Poor due to stock access, land management, keeping stock out will make a difference, need riparian controls	2	-	-	1	1	-	1	-	-	-	-	5
There have been some improvements, can do better	-	-	-	2	-	-	1	-	1	1	-	5
Now shallower – engineering & sediment	-	-	-	-	1	-	-	-	-	1	-	2
Water quality in streams is good	-	-	1	-	-	-	-	-	-	-	-	1

[1] This question along with 2 others was not asked at the Tokoroa drop-in session. Tokoroa was the first drop-in session that was held and out of its evaluation, one of the improvements suggested was to include these 3 questions that were at the stakeholder workshop

Some general statements around water quality included:

Upper Waikato

- Influence of the Wairakei geothermal extraction needs to be addressed (not a natural influence).
- Concern around degradation potentially impacting on the economic value of Kinleith Mill due to algae blooms caused by upstream discharges (leading to dissolved oxygen issues).
- Biodigesters.

Shallow Lakes

- Best management plans will make a difference (caps will not).
- There are some best practice improvements taking place.
- The importance of the lakes as an ecosystem not just as a back-wash for the river system.

Lower Waikato

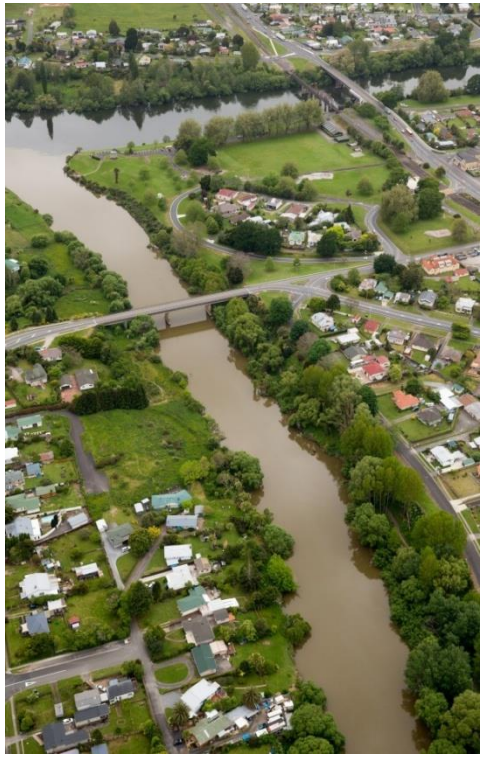
- The improvements in water quality in Lake Taupo have had no effect on the state of the river north and south of the Tuakau bridge.
- People who were born in this area want to look after it. Water is getting less and want someone to start something.

Waipa

- Some improvements in the Waitomo river catchment but much more needed in other small catchments. Steep land should be retired and restored to native vegetation.
- Concern that major rain events have significant influence on water clarity/sediment and that these events aren't part of the average when calculating the N,P,sediment clarity.
- There are issues with temperature.

Middle Waikato

- Some people do swim at Wellington Street and St Andrews.
- Concerned over contaminants from our cities, off roads affecting and if safe to swim in the Waikato River downstream of central Hamilton.
- Concern at waste water (rainfall) from streams, particularly urban.
- Effects of urban stormwater are an issue, particularly in tributaries of the Waikato. Needs to be addressed as part of the whole picture of stresses on our waterways.
- Kinleith discharge affect the river downstream – when Kinleith was closed due to strikes – water clarity improved dramatically.



11 What changes have you noticed?

This question was a follow on from the previous one: “What do you think about water quality in this part of the catchment and why?” At the stakeholder workshop an ‘information station’ was set up for each proposed FMU. At each station, there was paper for people to record their response to this question. The set up was similar at the five drop in sessions, with information on that FMU and the same question sheet as used at the stakeholder workshop.

This question was asked of stakeholders at the:

- Stakeholder workshop
- Middle Waikato drop in session (Hamilton)
- Lower Waikato drop in sessions (Huntly and Tuakau)
- Waipa drop in session (Otorohanga)

Table 21: Water quality: what changes have you noticed

Emerging theme	What changes have you noticed?											
	Stakeholder workshop					Drop in sessions ** Shallow Lakes information collected at Huntly & Tuakau*						Total
	Upper Waikato	Middle Waikato	Lower Waikato	Waipa	Shallow Lakes	Upper Waikato	Middle Waikato	Lower Waikato Huntly	Lower Waikato Tuakau	Waipa	*Shallow Lakes	
Water quality is worse due to poor land management, intensive farming, ponding, new dairy, weed issues	7	1	3	3	-	-	1	-	1	-	-	16
It is better than it was in the past, better recently (in river or tributaries)	2	-	-	4	1	-	5	2	-	1	-	15
Quality getting worse, increased eutrophication, algae	5	-	2	2	-	-	2	-	2	-	1	14
Water clarity bad or worse now affecting fish, eels, ducks, whitebait, sports, reputation	-	-	2	2	4	-	1	-	1	1	-	11
Pest species (koi carp, geese), pest influence	-	1	3	1	3	-	-	-	-	1	-	9
Issues with sediment	1	-	1	3	-	-	-	-	-	1	-	6
Water quality is poor, a disgrace	-	2	1	-	1	-	-	-	-	1	-	5
When it rains is worse, issues with sediment, human waste, stormwater, slime, E.coli	-	2	-	-	-	-	1	-	1	-	-	4
River bed lower relative to land, water levels are lower	1	-	-	1	-	-	-	-	-	2	-	4
Been an increase in restoration activity	1	-	2	-	1	-	-	-	-	-	-	4
Deforestation, erosion	3	-	-	-	-	-	-	-	-	-	-	3
No change	1	-	2	-	-	-	-	-	-	-	-	3
Smell and taste is worse	-	-	-	1	-	-	1	-	-	-	-	2
Flooding, balancing flood control & stream protection	-	-	-	2	-	-	-	-	-	-	-	2
No foam on the river in last few years	-	-		-	-	-	-	1	-	-	-	1

Some general statements around observed changes in quality included:

Lower Waikato

- The river has been turbid and discoloured at least 50 years.
- I wouldn't want to swim in the river but I love to kayak on it.
- I think we should encourage people who live by the water's edge to plant natives there to encourage native birds, and to stabilise banks.
- What impact on water quality will the Watercare increase take have?
- Is using it as a flood diversion/spill area a good idea?

Waipa

- Some major riparian planting around Pirongia Village with funding from Waipato River Clean Up Fund are a great initiative and should become an important asset for us.

Middle Waikato

- Need to 'quantify and qualify' the stormwater / urban impacts on receiving environments.

Upper Waikato

- More research needed on biodigester systems to combat algae.

12 How does water quality affect what you want to do in or with water?

This question was asked of stakeholders at the:

- Stakeholder workshop
- Middle Waikato drop in session (Hamilton)
- Lower Waikato drop in sessions (Huntly and Tuakau)
- Waipa drop in session (Otorohanga)

This question was aimed at finding out whether water quality affects (in practice) what organisations and communities want to do in or with water bodies in the Waikato and Waipa river catchments.

12.1 Question summary

This question was asked at the stakeholder workshop and at most of the drop-in sessions[2]. There were 110 responses in total from these fora. At the stakeholder workshop and the drop in sessions people answered this question whilst considering water quality in a particular FMU. It is therefore logical to group responses by FMU. Within each group of responses, comments have been themed and these can be found in tables 22-26 below.

Table 22: Upper Waikato – how does water quality affect what you want to do in or with water?

Upper Waikato FMU		
Emerging theme	**Theme counts**	
	Stakeholder workshop	**Total**
Poor water quality impacts on businesses, e.g. via nuisance plants, sediment and not being able to take as much water as we would like for irrigation	5	**5**
Poor water quality means we have to strike a balance between our economic and environmental goals and may lead to regulations which will put constraints on what individuals are allowed to do, incl potential restrictions on land use change	3	**3**
Poor water quality impacts fish health and fish numbers	2	**2**
Poor water quality has little to no impact on what is wanting to be done in or with water	2	**2**
Poor water quality impacts contact recreational use (both primary and secondary), e.g. by less visual clarity/altered colour of the water, nuisance plants impacting boating	2	**2**
Poor water quality upstream impacts on downstream users	1	**1**
Poor water quality impacts spiritual and community health	1	**1**
Total	**16**	**16**

[2] This question along with 2 others was not asked at the Tokoroa drop-in session. Tokoroa was the first drop-in session that was held and out of its evaluation, one of the improvements suggested was to include these 3 questions that were at the stakeholder workshop.

Table 23: Middle Waikato – how does water quality affect what you want to do in or with water?

Middle Waikato FMU			
Emerging theme	**Theme counts**		
	Stakeholder workshop	**Middle Waikato drop in**	**Total**
Poor water quality impacts contact recreational use (both primary and secondary), e.g. health effects caused by excess amounts of pathogens, poor water clarity	10	7	**17**
Poor water quality impacts drinking water, not only directly from water bodies but it also means extra cost (and capital expenditure) to treat it for municipal supply	2	4	**6**
Water quality and/or clarity has little to no impact on what is wanting to be done in or with water	2	2	**4**
Poor water quality impacts fish health, fish numbers and fishing values	1	2	**3**
Poor water quality impacts on businesses, e.g. need clean water for electricity generation boilers, limits the assimilative capacity for discharges	2	-	**2**
Poor water quality impacts amenity and hiking/camping values	-	2	**2**
Total	**17**	**17**	**34**

Table 24: Lower Waikato – How does water quality affect what you want to do in or with water?

Lower Waikato FMU				
Emerging theme	**Theme counts**			
	Stakeholder workshop	**Lower Waikato drop in - Huntly**	**Lower Waikato drop in - Tuakau**	**Total**
Poor water quality impacts contact recreational use (both primary and secondary), e.g. won't take my children swimming, try to keep head above surface, won't even let my dog swim in it	1	4	6	**11**
Poor water quality impacts on businesses, e.g. need clean water for electricity generation boilers, high *E.coli* means can't irrigate leaf crops, less water available for irrigation	4	-	-	**4**
Poor water quality impacts drinking water and the costs involved in getting it back to up to standard	-	1	1	**2**
Poor water quality has impacts but can still do what want with the water	1	-	-	**1**
Poor water quality impacts fish and bird health	-	-	1	**1**
Poor water quality impacts amenity values, e.g. eating picnic near river	-	1	-	**1**
Poor water quality means that people avoid water bodies that they would otherwise use	1	-	-	**1**
Total	**7**	**6**	**8**	**21**

Table 25: Waipa – How does water quality affect what you want to do in or with water?

Waipa FMU			
Emerging theme	**Theme counts**		
	Stakeholder workshop	**Waipa drop in**	**Total**
Poor water quality impacts contact recreational use (both primary and secondary), e.g. won't go in it, no more family outings to swimming holes	3	3	**6**
Poor water quality impacts social and amenity values, e.g. would like it to be pleasurable to walk or cycle along the banks, national pride and image	3	2	**5**
Poor water quality impacts fish health and numbers	3	2	**5**
Poor water quality has little to no impact on what is wanting to be done in or with water	4	-	**4**
Poor water quality impacts drinking water and higher costs to treat it for municipal supply	2	1	**3**
Poor water quality impacts on businesses, e.g. adds cost to clean water for commercial uses, tourism	-	2	**2**
Poor water quality could result in regulation that constrains choice and what land can be used for	1	1	**2**
Poor water quality impacts on ecosystem health and mauri values	1	-	**1**
Poor water quality impacts on the capacity of the rivers to assimilate town discharges	1	-	**1**
Poor water quality can changing the course of the water resulting in river flooding and washing away fencing	1	-	**1**
Total	**19**	**11**	**30**

Table 26: Monitored Shallow Lakes – how does water quality affect what you want to do in or with water?

Monitored Shallow Lakes FMU		
Emerging theme	**Theme counts**	
	Stakeholder workshop	**Total**
Poor water quality impacts contact recreational use (both primary and secondary), e.g. won't go in it, no more family outings to swimming holes	3	**3**
The lakes need attention, e.g. neglected, used to absorb flood schemes, need good rules to protect them, attention to koi carp	3	**3**
Poor water quality impacts on ecosystem health and mahinga kai values	2	**2**
Poor water quality could result in regulation that reduces the capital value of the land	1	**1**
Total	**9**	**9**

13 What is important to you/your sector about how we go about developing options?

This question was asked of stakeholders at the:

- Stakeholder workshop
- Upper Waikato drop in session (Tokoroa)
- Middle Waikato drop in session (Hamilton)
- Lower Waikato drop in sessions (Huntly and Tuakau)
- Waipa drop in session (Otorohanga)
- Online survey

This open ended question was asked across the workshop, drop in sessions and the online survey. Results are presented below in two tables. Table 27 shows themes coming from the drop in sessions and the online survey. Table 28 presents the themes from the stakeholder workshop (by sector).

Table 27: Themes around developing options: drop in sessions and the online survey

Emerging theme	Theme counts						
	Drop in sessions					Online survey	Total
	Upper Waikato	Middle Waikato	Lower - Huntly	Lower - Tuakau	Waipa		
Options must be sustainable, realistic, achievable, collaborative, practical, learning from similar projects elsewhere. Must be resourced to implement & monitor (including investment from crown).	1	2	1	1	1	26	32
Use good quality data for all sectors, peer review. Develop tools to accurately measure nutrients, look at issues with using OVERSEER, measure for each objective, fairness in point v non-point discharge data. Validate all data. Ensure a sound research base, expert advice	-	-	-	-	1	30	32
All aspects of economic impacts be fully considered, costs, benefits & impacts, equal weighting across economic – community, balance timeframe with cost, fully costed	-	1	-	-	1	28	30
Work with TAs, the community, tangata whenua, sectors and keep talking, ongoing education is required. Must have sector engagement on this journey. Need urban buy-in	-	2	1	1	1	25	30
Options must be fair (between FMUs), transparent with all contributing, equity between sectors (no trade-offs), equitable	1	1	-	1	-	22	25
Farms/industry must remain economically viable & internationally competitive. Not requiring infrastructure change (retain pasture based). Beware unintended consequences for farms. Stage the change.	1	4	-	-	1	15	21
Identify cause & effect of issues, benchmarking. Don't set bar too low	-	-	1	1	-	11	13
Solutions take into account the whole environment, whole ecosystem and are flexible, simple solutions for best gain	-	1	-	1	-	9	11
Consider future, population growth and climate change, allow for future science improvements, invest in innovation & science for the future	-	1	-	-	-	8	9
Look at same options over different timescales with short & long term initiatives running in parallel, start small	-	-	-	1	-	6	7
Showcase good practice and capture enthusiasm of landowners/community, provide support for projects, develop capability	-	1	-	1	1	3	6
Consider all legislative requirements, protect existing legal rights, mix regulation with	-	-	-	1	-	4	5

incentivising, consider compulsion							
Create certainty in rules, objectives and policies, don't over allocate, no grand-parenting, clarity & transparency in rules, regulations	-	-	-	-	-	4	4
Human health implications of scenarios are taken into account	-	-	-	-	-	4	4
Acknowledge best practice, allow best land use to still occur with best practice, don't be afraid of novel solutions, proactive not reactive	-	-	-	-	-	4	4
Retain reputation of high quality natural environment, 'clean, green'. Protect pristine aspects of river. Focus on ecosystem health not toxicity	-	-	-	-	-	3	3
Moratorium on forestry conversions until options are developed	-	-	-	-	-	1	1
That different soil types / geology is recognised	-	-	1	-	-		1
Talk to people who work in and around drains and rivers	-	-	-	-	-	1	1

In the last session of the stakeholder workshop participants sat in sector groups. They were asked "what is important to your sector about how we go about developing options" (in relation to research and modelling scenarios). Note that under the "rural professionals" column there is included feedback received at the 15 April 2015 meeting of the New Zealand Institute of Primary Industry Management (NZIPIM) at AgResearch, Ruakura. Many of the people (around 30) giving feedback at this meeting were farm consultants.

Table 28: Question summary – themes from the stakeholder workshop by sector

Emerging themes	Dairy	Sheep & Beef	Horticulture	Community	Energy	Forestry	Environment / NGOs	Rural Professionals	Rural Advocacy	Māori Interest	Local Govt (incl. Water Takes)*	Central Govt & Health	Tourism & Recreation	Industry	TOTAL
Options must be sustainable, realistic, achievable, collaborative, practical, learning from similar projects elsewhere. Must be resourced to monitor (including investment from crown).	4	1	2	1	2	-	1	5	1	4	2	-	-	2	25
Use good quality data for all sectors, peer review. Develop tools to accurately measure nutrients, look at issues with using OVERSEER, measure for each objective, fairness in point v non-point discharge data. Validate all data. Ensure a sound research base, expert advice	8	3	2	-	1	-	3	3	-	1	1	-	1	1	24
Options must be fair (between FMUs), transparent with all contributing, equity between sectors (no trade-offs), equitable	6	1	2	1	2	-	1	6	2	-	2	-	-	1	24
Farms/industry must remain economically viable & internationally competitive. Not requiring infrastructure change (retain pasture based). Beware unintended consequences for farms. Stage the change.	6	3	3	-	-	1	-	3	1	1	-	-	-	2	20

All aspects of economic impacts be fully considered, costs, benefits & impacts, equal weighting across economic – community, balance timeframe with cost, fully costed	2	-	1	-	2	-	1	3	1	1	3	1	1	2	18
Create certainty in rules, objectives and policies, don't over allocate, no grand-parenting, clarity & transparency in rules, regulations	6	1	2	-	1	1	-	1	-	-	2	1		2	17
Work with TAs, the community, tangata whenua, sectors and keep talking, ongoing education is required. Must have sector engagement on this journey. Need urban buy-in	2	-	1	2	-	-	1	5	2	2	2	-	-	-	17
Look at same options over different timescales with short & long term initiatives running in parallel, start small	1	1	1	1	1	-	1	3	3	-	2	1	-	1	16
Consider future, population growth and climate change, allow for future science improvements, invest in innovation & science for the future	3	-	1	1	2	-	1	2	1	-	-	1		1	13
Showcase good practice and capture enthusiasm of landowners/community, provide support for projects, develop capability	4	1	1	-	1	1	1	2	-	-	-	-	1	-	12
Solutions take into account the whole environment, whole ecosystem and are flexible, simple solutions for best gain	1	1	-	-	1	-	2	1	1	1	1	-	1	-	10
Consider all legislative requirements, protect existing legal rights, mix regulation with incentivising, consider compulsion	2	-	-	-	1	-	3	-	-	-	-	1	-	1	8
Acknowledge best practice, allow best land use to still occur with best practice, don't be afraid of novel solutions, proactive not reactive	1	1	1	-	-	2	1	-	1	-	1	-	-	-	8
Identify cause & effect of issues, benchmarking. Don't set bar too low	1	-	1	-	-	1	2	-	-	2	-	-	-	1	8
Retain reputation of high quality natural environment, 'clean, green'. Protect pristine aspects of river. Focus on ecosystem health not toxicity	-	-	-	1	-	-	2	-	-	-	-	-	3	-	6
Acknowledge extreme weather events, buffer for targets	1	-	-	-	-	-	-	-	1	-	1	-	-	-	3
Moratorium on forestry conversions until options are developed	-	-	-	-	-	-	2	-	-	-	-	-	-	-	2
Human health implications of scenarios are taken into account	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
Set limits (nitrogen, P) that don't compromise economic development	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Plan change must be acceptable to iwi	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Costs of implementation should not fall to Territorial Authorities (TAs)	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Total	48	13	17	8	14	6	22	35	14	12	19	6	7	15	

* Water Takes representatives joined with the local government sector table for this group exercise

14 What more could be done for better water quality?

This question was aimed at finding out what thoughts stakeholders had for actions or other ideas to achieve better water quality, over and above what is already being done.

This question was asked of stakeholders at the:

- Stakeholder workshop
- Upper Waikato drop in session (Tokoroa)
- Middle Waikato drop in session (Hamilton)
- Lower Waikato drop in sessions (Huntly and Tuakau)
- Waipa drop in session (Otorohanga)

14.1 Question summary

This question was the last question asked at both the stakeholder workshop and the drop in sessions. There were 248 responses in total from these fora. By nature it is quite a 'catch all' question and as such there were many varied responses to this question. On analysis, many themes emerged and these are contained in table 29 below.

Table 29: Emerging themes from the 'what more could be done for better water quality?' question

Emerging theme	Theme counts						
	Stakeholder workshop	Upper Waikato drop in	Middle Waikato drop in	Lower Waikato drop in - Huntly	Lower Waikato drop in - Tuakau	Waipa drop in	**Total**
More communication and education/guidance: improve public awareness, more urban education, more positive stories, more extension (incl farm MENUs), visibility of monitoring and progress, expectation management (e.g. costs for lakes)	29	-	-	-	1	3	**33**
Everyone needs to contribute to the solution and take responsibility for their part of the problem (and not be liable for more than their part of the problem), incl more community engagement, doing actions on your own land and getting 'buy in'	10	-	1	2	1	5	**19**
Ensure wastewater systems (treatment plants, septic tanks etc) and stormwater systems are at best practice, are able to meet future needs and that point sources are minimised	12	-	3	-	1	-	**16**
More riparian margins, fencing off streams (incl sheep only area fencing), planting next to waterways, maintenance of riparian margins	9	1	-	-	3	-	**13**
Incentives, incl incentives to mitigate, tax breaks, financial encouragement, credits for discharging better water quality, rewards for ecosystem services	9	1	-	-	-	-	**10**
Increase monitoring (esp in tributaries), look at future monitoring needs, look at a range of tools for measurement (incl non-scientific tools)	6	2	-	-	2	-	**10**

Better management of flows/water quantity/water takes, more water conservation practices	9	-	-	-	-		**9**
Better understanding of the science (incl more research on the root cause of contaminants, natural baselines, sources of contaminants, capacity of land, mitigation techniques, OVERSEER calibration and nutrient cycling under crops)	6	-	2	-	-		**8**
Better management of sediment issues on land and in water bodies (incl sediment traps, land retirement, no-tillage, winter steep slope management and solutions for suspended sediment in waterways)	5	2	-	-	-	1	**8**
Encouraging good practice, recognising/rewarding good practice and consistency of messaging in regard to good practice for farm and forestry management	5	3	-	-	-		**8**
Pest fish control	4	-	-	1	3		**8**
Other (includes: focus on the health of the ecosystem, output based monitoring per farm, feasibility assessment for forestry planting on farms, provision of more toilet facilities at camping and recreation areas, industry led initiatives, transferable development rights, look into runoff from roads, go back to purely grass based system)	6	-	-	1	-	1	**8**
Support initiatives, create education pathways, resource community and catchment groups (e.g. landcare groups) and enviro-schools programmes	6	-	-	-	-	1	**7**
Prioritise critical source areas, minimise actions that put high levels of contaminants into waterways, focus on low hanging fruit and best bang for buck	6	-	1	-	-		**7**
Look at and recognise there are a range of potential solutions to managing water quality , incl 'out of the box' solutions (removing infrastructure, nutrient harvesting out of the water, introducing biology to the water to improve water quality, deepening shallow lakes, clearing river beds of rubbish)	5	-	-	1	-	1	**7**
Land use and stock class matching to land use capability (LUC)	4	-	1	-	-	2	**7**
Potential moratorium or stopping of land use conversions, no more land clearance, no more intensification	3	-	2	-	-	2	**7**
Coordinated and collaborative approaches (incl catchment level plans, collectives)	4	-	1	-	1	-	**6**
More utilisation of forage crops, good grass covers and more efficient fertilisers for better contaminant management, and better understanding of cultivation practices (incl practices that release contaminants)	4	2	-	-	-	-	**6**
More wetlands (incl floating wetlands) and maintenance of existing	5	-	-	-	-	-	**5**

wetlands							
Greater and fairer (enforce all parties equally) enforcement of non-compliance, more monitoring of consent conditions, proactive enforcement	4	-	1	-	-	-	**5**
Living up to kaitiakitanga for water management, improving mana and linking in the Māori world view	2	-	-	1	-	2	**5**
Better regulatory processes (e.g. simplify consents process, make env. friendly works permitted activities, easier covenanting) and council improving its practices (incl flood control)	5	-	-	-	-	-	**5**
Look at and recognise there are multiple factors affecting water quality (e.g. koi carp, flood protection, historical differences, urbanisation) and contributing factors other than water, i.e. look beyond just water management	2	-	-	-	-	3	**5**
Groundwater activities, incl better aquifer information, aquifer injection, aquifer storage and recovery (ASR)	4	-	-	-	-	-	**4**
Farm level environmental plans (e.g. SMP, LEP), incl following COPs and guidelines	4	-	-	-	-	-	**4**
Exotic bird control	3	-	-	-	-	-	**3**
Emphasise the tributaries and better tributary management	3	-	-	-	-	-	**3**
Limits on N and P, control of farm emissions , rules	2	-	-	-	-	1	**3**
Acknowledge long time scale and set achievable milestones/progressive targets	-	-	-	-	-	3	**3**
Learning from others experiences, incl international experiences	2	-	-	-	-	-	**2**
Central Govt funding support (incl support for weed management)	2	-	-	-	-	-	**2**
Recognise variety in practices and within industries	2	-		-	-	-	**2**
Total	**182**	**11**	**12**	**6**	**12**	**25**	**248**

14.2 Stakeholder workshop – specific sector feedback (from table discussions)

This question was one of three questions that were asked at the stakeholder workshop while stakeholders were in their sector[3] groups. As such it is possible to attribute which theme came from which sectors. This could provide valuable insight into the current thinking of these sector groups in regards to their ideas for what more could be done for better water quality. This analysis is shown in table 30 below and also highlights themes that are common across multiple sectors and those that are unique to some sectors.

Table 30: Themes present in sector comments

Key:√ = theme was present in this sectors comments

Themes	Dairy	Sheep & Beef	Horticulture	Community	Energy	Forestry	Environment / NGOs	Rural Professionals	Rural Advocacy	Māori Interests	Local Govt (incl. Water Takes	Central Govt & Health	Tourism & Recreation	Industry	**Total**
More communication and education/guidance: improve public awareness, more urban education, more positive stories, more extension (incl farm MENUs), visibility of monitoring and progress, expectation management (e.g. costs for lakes)	√	√	√	√	-	√	-	√	√	√	√	√	-	√	**11**
Everyone needs to contribute to the solution and take responsibility for their part of the problem (and not be liable for more than their part of the problem), incl more community engagement, doing actions on your own land and getting 'buy in'	√	-	-	√	-	-	√	-	√	√	√	-	√	√	**8**
Incentives, incl incentives to mitigate, tax breaks, financial encouragement, credits for discharging better water quality, rewards for ecosystem services	√	√	√	-	-	-	-	-	√	√	√	√	-	√	**8**
More riparian margins, fencing off streams (incl sheep only area fencing), planting next to waterways, maintenance of riparian margins	√	√	√	-	√	-	√	-	-	-	√	-	-	√	**7**
Better management of flows/water quantity/water takes, more water conservation practices	√	-	-	-	-	-	-	-	√	√	√	√	√	-	**6**

[3] 'Community' was included as a sector for this exercise and the 'Water Supply Takes' sector joined with the 'Local Government' sector due to small numbers from that sector

Other (includes: focus on the health of the ecosystem, output based monitoring per farm, feasibility assessment for forestry planting on farms, provision of more toilet facilities at camping and recreation areas, industry led initiatives, transferable development rights, look into runoff from roads, go back to purely grass based system)	-	-	√	√	-	√	√	-	-	-	√	-	√	-	**6**
Ensure wastewater systems (treatment plants, septic tanks etc) and stormwater systems are at best practice, are able to meet future needs and that point sources are minimised	√	-	√	-	√	-	-	-	-	-	√	-	√	-	**5**
Better understanding of the science (incl more research on the root cause of contaminants, natural baselines, sources of contaminants, capacity of land, mitigation techniques, OVERSEER calibration and nutrient cycling under crops)	-	-	√	√	√	-	-	-	-	-	√	√	-	-	**5**
Better management of sediment issues on land and in water bodies (incl sediment traps, land retirement, no-tillage, winter steep slope management and solutions for suspended sediment in waterways)	-	-	√	-	√	-	√	-	√	-	√	-	-	-	**5**
Increase monitoring (esp in tributaries), look at future monitoring needs, look at a range of tools for measurement (incl non-scientific tools)	-	√	√	√	-	-	-	-	-	-	√	-	-	-	**4**
Support initiatives, create education pathways, resource community and catchment groups (e.g. landcare groups) and enviro-schools programmes	√	-	-	√	-	-	√	-	-	√		-	-	-	**4**
Prioritise critical source areas, minimise actions that put high levels of contaminants into waterways, focus on low hanging fruit and best bang for buck	√	-	-	-	-	-	√	-	√	-	√	-	-	-	**4**
Groundwater activities, incl better aquifer information, aquifer injection, aquifer storage and recovery (ASR)	√	-	-	-	√	-	-	-	-	√	√	-	-	-	**4**
Farm level environmental plans (e.g. SMP, LEP), incl following COPs and guidelines	√	-	√	-	√	-	-	-	√	-	-	-	-	-	**4**
Land use and stock class matching to land use capability (LUC)	-	√	-	-	-	-	-	√	√	-	√				**4**
Better regulatory processes (e.g. simplify consents process, make env. friendly works permitted activities, easier covenanting) and council improving its practices (incl flood control)	-	-	-	-	-	-	√	-	√	-	-	-	√	√	**4**
Greater and fairer (enforce all parties equally) enforcement of non-compliance, more monitoring of consent conditions, proactive enforcement	√	-	-	-	-	-	-	-	√	-	√	-	-	-	**3**

Look at and recognise there are a range of potential solutions to managing water quality , incl 'out of the box' solutions (removing infrastructure, nutrient harvesting out of the water, introducing biology to the water to improve water quality, deepening shallow lakes, clearing river beds of rubbish)	√	-	-	-	-	-	-	√	-	√	-	-	-	-	**3**
Coordinated and collaborative approaches (incl catchment level plans, collectives)	√	-	-	-	-	√	-	-	√	-	-	-	-	-	**3**
Pest fish control	√	-	-	-	√	-	-	-	√	-	-	-	-	-	**3**
Emphasise the tributaries and better tributary management	√	-	-	√	-	-	-	-	-	-	√	-	-	-	**3**
Potential moratorium or stopping of land use conversions, no more land clearance, no more intensification	-	-	-	-	√	-	-	√	-	-	-	-	√	-	**3**
More utilisation of forage crops, good grass covers and more efficient fertilisers for better contaminant management, and better understanding of cultivation practices (incl practices that release contaminants)	-	-	√	-	-	-	√	-	-	-	√	-	-	-	**3**
Exotic bird control	√	-	-	-	-	-	-	-	√	-	-	-	-	-	**2**
More wetlands (incl floating wetlands) and maintenance of existing wetlands	-	-	-	-	-	-	√	-	√	-	-	-	-	-	**2**
Encouraging good practice, recognising/rewarding good practice and consistency of messaging in regard to good practice for farm and forestry management	√	-	-	-	-	-	-	-	√	-	-	-	-	-	**2**
Limits on N and P, control of farm emissions , rules	-	-	-	-	-	-	√	-	-	-	-	-	√	-	**2**
Learning from others experiences, incl international experiences	-	-	-	-	-	-	-	-	-	√	-	-	-	√	**2**
Central Govt funding support (incl support for weed management)	-	-	-	-	√	-	-	-	-	-	√	-	-	-	**2**
Living up to kaitiakitanga for water management, improving mana and linking in the Māori world view	-	-	-	-	-	-	-	-	-	√	-	-	-	-	**1**
Look at and recognise there are multiple factors affecting water quality (e.g. koi carp, flood protection, historical differences, urbanisation) and contributing factors other than water, i.e. look beyond just water management	-	-	-	-	-	-	-	-	√	-	-	-	-	-	**1**
Recognise variety in practices and within industries	-	-	√	-	-	-	-	-	-	-	-	-	-	-	**1**
Total no. of themes identified (out of a possible 33)	**17**	**5**	**11**	**7**	**9**	**3**	**10**	**4**	**16**	**9**	**17**	**4**	**7**	**6**	

15 What comments do you have about the draft list of attributes?

This question was aimed at testing the CSG's draft list of attributes with the wider community. This was one of two questions that were specifically aimed at achieving Objective E of the CSG's Community Engagement Plan – "Test the CSG's Freshwater Management Units (FMUs) option and selected attributes".

This question was asked of stakeholders at the:

- Stakeholder workshop
- Upper Waikato drop in session (Tokoroa)
- Middle Waikato drop in session (Hamilton)
- Lower Waikato drop in sessions (Huntly and Tuakau)
- Waipa drop in session (Otorohanga)
- Online survey

15.1 Question summary – stakeholder workshop and drop in sessions

This was asked at both the stakeholder workshop and the drop in sessions and resulted in 176 comments from these fora. These comments can be categorised into four categories; comments in support, comments opposed, questions and statements that are not necessarily in support or opposition. Within each category the comments have been themed and can be found in tables 32-33 below. Additionally many stakeholders also had specific suggestions for attributes and/or indicators. These have been grouped by whether stakeholders would like a proposed attribute to be an attribute, indicator or either (if they did not specify). These responses are set out in table 34 below.

15.2 Question summary – online Survey

This was question 14 of the online survey. Survey participants were asked "Is there any comment you would like to make about the proposed list of attributes? *For example, which of the attributes the CSG are considering do you support? What other attributes should the CSG be considering?*" and given a comment box to respond in. This resulted in 145 comments which have been themed and included in the tables with the workshop and drop in sessions. This question also resulted in specific suggestions for attributes and/or indicators and these have been included in table 36 .

Value	Attribute	In NPS	Water body type/s	Importance	Currently monitored (WRC)
Human health for recreation	E. Coli	Yes	• Lakes • Rivers	Risk of infection /illness form contact /ingestion	Yes
	Planktonic cyanobacteria	Yes	• Lakes • Lake-fed rivers	Toxic algae, makes people sick. Risks include respiratory, irritation, allergy symptoms	In 5 lakes only
	Water clarity	No	• Lakes • Rivers	Affects peoples': • Safety • Desire to swim	Yes
Ecosystem Health	Phytoplankton	Yes	Lakes and Waikato mainstem	Excessive algal/plant growth impacts ecological communities	Yes (Waikato mainstem)
	Total Nitrogen				Yes
	Total Phosphorus				
	Nitrate		Rivers	Affects growth of some species	
	Ammonia		Lakes and rivers	Affects survival of some species	
Mahinga kai	E.coli	No	• Lakes • Rivers	Risk of infection/illness from contact/ingestion	Yes
	Cyanobacteria		• Lakes • Rivers	Toxic algae, makes people sick. Risks include respiratory, irritation, allergy symptoms	

Table 31: The CSG's draft attribute table

About attributes

Attributes are the indicators that will be used to determine how healthy (or unhealthy) a water body is.

Attribute states are the numbers or narrative descriptions that describe what level of an attribute is needed to meet a certain level of water quality health. Attributes are an essential step in the National Objectives Framework (NOF) process.

Table 32: Themed comments in support of the proposed attribute list

Comments in support of attribute list								Total comments in support = 80
Emerging theme	**Theme counts**							
	Stakeholder workshop	Upper Waikato drop in	Middle Waikato drop in	Lower Waikato drop in - Huntly	Lower Waikato drop in - Tuakau	Waipa drop in	Online survey	**Total**
Happy with/Support/comfortable with the list of attributes	6	-	-	-	-	2	37	**45**
Happy that there are more attributes then the NPS, covers a wide range, is comprehensive	2	-	-	-	-	-	3	**5**
Like the *E.coli* attribute	3	-	-	-	-	-	2	**5**
Like the TP attribute	1	-	-	-	-	-	4	**5**
Like the cyanobacteria attribute	2	-	-	-	-	-	2	**4**
Trust the technical group, can see good thought has gone into the list, like that there are scientific measures	3	-	-	-	-	-	1	**4**
Like the water clarity attribute	4	-	-	-	-	-	-	**4**
Like the TN attribute	2	-	-	-	-	-	2	**4**
Like the nitrate attribute	2	-	-	-	-	-	-	**2**
Like the phytoplankton attribute	1	-	-	-	-	-	-	**1**
Like the ammonia attribute	1	-	-	-	-	-	-	**1**
Totals	**27**	**0**	**0**	**0**	**0**	**2**	**51**	**80**

Table 33: Themed comments opposed to the proposed attribute list

Comments opposed to the attribute list								Total comments opposed = 38
Emerging theme	**Theme counts**							
	Stakeholder workshop	Upper Waikato drop in	Middle Waikato drop in	Lower Waikato drop in - Huntly	Lower Waikato drop in - Tuakau	Waipa drop in	Online survey	**Total**
Too many attributes, keep it simple	2	-	-	1	-	-	5	**8**
Do not agree with the list of attributes (either due to cost, monitoring difficulty or no reason given)	-	-	-	-	-	-	7	**7**
Do not like the water clarity attribute	3	-	-	-	-	-	4	**7**
Not enough attributes	1	-	-	-	-	-	5	**6**
Too simplistic, list ignores other water health aspects (e.g. pest fish and their impact on waterways)	1	-	-	-	-	-	3	**4**
No overall measure of ecosystem health	1	-	-	-	-	-	1	**2**
Do not like having toxicity as an attribute	-	-	-	-	-	-	1	**1**
Do not like the *E.coli* attribute	-	-	-	-	-	-	1	**1**
Do not like the Total N attribute	-	-	-	-	-	-	1	**1**
Do not like the Total P attribute	-	-	-	-	-	-	1	**1**
Totals	**8**	**0**	**0**	**1**	**0**	**0**	**29**	**38**

Table 34: Themed questions about the proposed attribute list

Questions	Total questions = 88							
Emerging theme	**Theme counts**							
	Stakeholder workshop	Upper Waikato drop in	Middle Waikato drop in	Lower Waikato drop in - Huntly	Lower Waikato drop in - Tuakau	Waipa drop in	Online survey	**Total**
Questions about the monitoring sites and measurement of attributes *(incl where are the sites, are there enough, are they in the right places, when are measurements taken etc)*	16	-	-	-	-	-	1	**17**
Questions about, what factors have been considered when selecting attributes and the suitability/'achievability' of attributes	11	1	1	-	-	-	2	**15**
Technical questions about aspects of the attributes and/or attribute states themselves *(e.g. the difference between nitrate and total N)*	10	-	1	-	-	2	2	**15**
Questions about why some things are left out of the list of attributes	9	-	1	-	-	-	5	**15**
Questions about sources and/or causes of attributes/contaminants	3	1	2	-	-	-	-	**6**
Questions about how we will deal with the interaction between other out of scope aspects and their impact on water quality *(e.g. koi carp)*, and how we will handle natural impacts *(e.g. tannins)*	2	1	2	-	-	-	1	**6**
Questions about how we will deal with the interaction between water quality and quantity	2	1	-	-	-	1	-	**4**
Questions about the social and or economic consequences/implications of having more attributes or choosing some attributes over others	3	-	-	-	-	-	-	**3**
Questions regarding the impact on reducing contaminants of specific actions *(e.g. fencing off waterways, wetlands)* and linkages between the water and what landowners are doing	3	-	-	-	-	-	-	**3**
Questions relating to the interaction between attributes and timeframes and/or priorities	1	1	-	-	-	-	-	**2**
Can the narrative attributes also have a quantitative component?	-	-	-	-	-	-	2	**2**
Totals	**60**	**5**	**7**	**0**	**0**	**3**	**13**	**88**

Table 35: Themed statements not necessarily supporting or opposed to the proposed attribute list

Statements not necessarily supporting or opposed (incl attribute list related responses)								Total statements = 120
Emerging theme	**Theme counts**							
	Stakeholder Workshop	Upper Waikato drop in	Middle Waikato drop in	Lower Waikato drop in - Huntly	Lower Waikato drop in - Tuakau	Waipa drop in	Online survey	**Total**
Statements relating to scientific aspects regarding attributes, incl needing to consider cause and effect, discussions about N vs P, can't do anything about tannins etc	18	-	2	1	-	-	12	**33**
Statements relating to measurement and/or monitoring *(e.g. measure tributaries as well as main stem, look into creating more long term sites, difficulties with narrative statement attributes)*	9	-	2	-	-	-	11	**22**
Don't have enough information to make a judgement on the list of attributes and statements regarding wanting more information	4	1	-	-	-	-	7	**12**
Statements relating to the interconnectivity of human health, ecosystem health, mahinga kai and biodiversity aspects	4	1	1	-	-	-	5	**11**
CSG and/or decision makers need to keep other factors in mind (as well as attributes), such as flow on effects, local knowledge and what is realistic/achieveable	5	-	1	-	-	-	4	**10**
Statements relating to the effects of management of land on contaminants	5	1	-	-	-	-	4	**10**
Statements relating to trusting the technical experts advice on attributes	2	-	-	-	2	-	6	**10**
Statements relating to having more and/or different attributes to the NPS/NOF	4	-	1	-	-	-	2	**7**
Need to consider timeframes when selecting attributes and keep flexibility for new innovations	4	-	-	-	-	-	1	**5**
Totals	**55**	**3**	**7**	**1**	**2**	**0**	**52**	**120**

Below is the table (table 36) that contains specific suggestions from stakeholders for attributes and/or indicators. At the Upper Waikato drop in session, and both of the Lower Waikato drop in sessions no specific suggestions for attributes or indicators were received. These drop in sessions have been omitted from the table below.

Key

A: included as an attribute
I: included as an indicator
E: either an attribute or an indicator (not specified)

Table 36: Specific suggestions for attributes and indicators

Specific suggestions for attributes and indicators																
	Counts															
	Stakeholder workshop			Middle Waikato drop in			Waipa drop in			Online survey			Total			
Support for having indicators as well as attributes	5						1			10			16			
Opposed to having indicators as well as attributes										2			2			
Specific measures	A	I	E	A	I	E	A	I	E	A	I	E	**A**	**I**	**E**	**Total**
Macroinvertebrate Community Index (MCI)	2		1							3	3	10	**5**	**3**	**11**	**19**
Dissolved Oxygen (DO)	1		3			1				3	2	6	**4**	**2**	**10**	**16**
Macrophytes/Submerged Plant Index (SPI)	2									3	2	5	**5**	**2**	**5**	**12**
Periphyton	1		1							3	2	4	**4**	**2**	**5**	**11**
Heavy metals			4			1				1	1	3	**1**	**1**	**8**	**10**
Temperature			2			1			1	1	1	3	**1**	**1**	**6**	**8**
Fish populations (native and/or exotic)								1		1	1	3	**1**	**2**	**3**	**6**
Hydrocarbons			1								1		**0**	**1**	**1**	**2**
Other microbes, e.g. Protozoa, Total Heterotrophic Plate Count (THPC), Campylobacter												2	**0**	**0**	**2**	**2**
Flow / water quantity			1									1	**0**	**0**	**2**	**2**
Suspended Sediment												2	**0**	**0**	**2**	**2**
Visual feature (such as dead fish/birds)			1										**0**	**0**	**1**	**1**
Wetland and riparian plantings attribute	1												**1**	**0**	**0**	**1**
Smell/odour			1										**0**	**0**	**1**	**1**
Herbicides, pesticides, fungicides						1							**0**	**0**	**1**	**1**
Giardia				1									**1**	**0**	**0**	**1**
USC (?) invertebrate measure		1											**0**	**1**	**0**	**1**

One stakeholder, via the online survey, also suggested the following measures (as well as heavy metals, temperature and dissolved oxygen) to be included as attributes; pH, TDS (total dissolved solids), conductivity, biological indicators (such as the aquatic larvae of insects), trophic state, Polycyclic aromatic hydrocarbons (PAH), dioxins and furans.

Some other suggestions also came through the feedback to this question. These included:

- Total N applied to all water bodies not just mainstem and lakes (stakeholder workshop)
- Cyanobacteria applied to not only lakes but hydro lakes and rivers (stakeholder workshop)
- Shallow groundwater monitoring should be considered as a way to measure recent land use (online survey)
- Need an indicator for economic health that balances with water body health (online survey)
- Develop some Water Healthy Indexes that would be the result of a number of factors and dependant on intended use, i.e. different indexes for Drinking, Swimming, Fishing, Boating etc (online survey)
- Measure abundance of target species with a view to implementing rahui if the fishing becomes unsustainable (online survey)

16 What timeframes do you think are reasonable to achieve the values by?

This question was aimed at trying to gauge the expectations of stakeholders in regards to timeframes, which in turn could be useful at assisting the CSG to set targets.

This question was asked of stakeholders at the:

- Stakeholder workshop
- Upper Waikato drop in session (Tokoroa)
- Middle Waikato drop in session (Hamilton)
- Lower Waikato drop in sessions (Huntly and Tuakau)
- Waipa drop in session (Otorohanga)

16.1 Question summary – stakeholder workshop and drop in sessions

This question was asked at both the stakeholder workshop and the drop in sessions, but was not part of the online survey. Stakeholders were asked "What timeframes do you think are reasonable to achieve the values by?" The answers to this question were quite diverse and as a result many themes have been identified. These themes are shown in table 37 below. No responses to this question were given at the Upper Waikato drop in session.

Table 37: Emerging themes from 'what timeframes do you think are reasonable to achieve values by' question

Emerging theme	Theme counts						
	Stakeholder workshop	Upper Waikato drop in	Middle Waikato drop in	Lower Waikato drop in - Huntly	Lower Waikato drop in - Tuakau	Waipa drop in	**Total**
The timeframes should depend on what the 'science' says (including information on groundwater lags)	11	-	1	-	-	-	**12**
The timeframes should depend on the affordability to the community and the viability of landowners to adapt (including results of economic analysis)	8	2	2	-	-	-	**12**
The issues will take a long time (e.g. multi generational) to fix	7	-	-	1	-	2	**10**
Need to have a progressive process with milestones e.g. progressive KPIs, stepped change	6	-	2	-	-	1	**9**
There should be different timeframes for different values and/or attributes	7	-	-	-	-	-	**7**
Do it once and do it right (don't want shifting targets/goal posts)	6	-	1	-	-	-	**7**
The timeframes should depend on social/attitude change and	3	-	-	-	1	2	**6**

getting buy-in							
Continuous improvement	5	-	-	1	-	-	**6**
There should be different timeframes for different parts (both at a FMU scale and within)	5	-	-	-	-	-	**5**
Have flexibility (new issues will arise, new technology will be developed)	5	-	-	-	-	-	**5**
Timeframes should be reasonable (i.e. not too long)	1	-	-	1	3	-	**5**
The timeframes should depend on the levels set, options chosen and/or the impacts on activities	5	-	-	-	-	-	**5**
Other (*includes separate outcomes from regulations, depend on NPS-FM timeframes and out of scope responses)*	2	-	2	-	-	-	**4**
Prioritisation of actions	2	-	-	1	-	-	**3**
The timeframes should depend on the planning cycle (i.e. 10 year plans) and/or limits should be reviewed every 10 years	2	-	1	-	-	-	**3**
There should be an immediate moratorium imposed on land conversions and/or population increase	2	-	1	-	-	-	**3**
The timeframes should depend on the response rate of natural systems (lag between actions and outcomes)	2	-	-	-	-	-	**2**
The timeframes should depend on what the consent process will be and what is being enforced	2	-	-	-	-	-	**2**
Total	**81**	**2**	**10**	**4**	**4**	**5**	**106**

Some stakeholder comments included specific feedback (i.e. a number of years) regarding timeframes to achieve values by. See table 38 below for a table with different timeframes and what values stakeholders have said are reasonable to achieve by those timeframes.

Table 38: Timeframes stakeholders say are reasonable to achieve the values by

1-5 years	5 years	10 years
• Announce immediate moratorium on land conversions in upper catchment • stopping development that will have direct impact on contaminants to river • develop best practice procedures • start implementing • Implement best form practice achieved	• Mitigations in place • Develop system that links farm system with regulatory systems • 5-7 years should see improvements from afforestation	• Social acceptance • Showing positive trends • All farms have land and environment plans • Bring industry up to standard incl any required mitigations • Develop systems around proof of standard • N transfer system developments • See 10% drop in elemental N, P. • measured safe to swim in Huntly • 10% drop in sediment loading (esp Waipa) • Water clarity goals reached
10-20 years	**20 years**	**25 years**
• Implement best form practice achieved	• Ability to swim • Biodiversity / ecology • Ability to eat e.g. whitebait, eel, watercress • Mahinga kai (not sure as some kai appear safe to eat now)	• Time to adapt
30 years	**20+ years**	**50+ years**
• Measurable improvement • Upper catchment	• Ability to swim • Shellfish to be able to eat raw (lakes longer) • Biodiversity / ecology • Drinkable in Huntly • Put a dam on the Waipa sediment. • Reverse deteriorating trends for N within 50 years	• Results of mitigations will take generations for the effects to be seen • Lower catchment • Human Health, ecoli, cyanobacteria, phytoplankton (but with 10 year milestones) • achieve ‘in river’ improvements (10 year milestones)

17 Glossary of terms

The complex and technical nature of the Healthy Rivers: Plan for change / Wai Ora: He Rautaki Whakapaipai project (henceforth referred to as the Healthy Rivers project) inevitably results in technical jargon and acronyms. To assist readers of this report, below is a non-exhaustive glossary of common terms and acronyms relating to the report and the wider Healthy Rivers project. Explanations are included and in some cases there is a link to further information to assist readers should they wish to learn more.

For further information on a range of scientific terms, check out the Land, Air, Water Aotearoa (LAWA) site which has an excellent glossary - http://www.lawa.org.nz/learn

A lot of information and monitoring data for our lakes and rivers can be found on the Waikato Regional Council website. For information on water quality state and trends for a range of factors for rivers in the Waikato region check out this page - http://www.waikatoregion.govt.nz/Environment/Natural-resources/Water/Rivers/ and check out this page for information about groundwater, lakes, storm water and much more - http://www.waikatoregion.govt.nz/Environment/Natural-resources/Water/

Acronym	Term	Explanation
A		
	Algae	Small, often microscopic plants. Freshwater algae grow in the water or on rocks on river beds and lake shores. Large quantities of algae are also called algal blooms.[4]
	Algal blooms	A rapid increase in the population of algae in a water body. Blooms can reduce the amount of light and oxygen available. Some types of algae may be toxic if ingested or can be an irritant to skin and eyes.[1]
	Ammonia	Ammonia (chemical formula NH3) is a gas and a common nitrogen-based contaminant that at high concentrations and under certain temperature and pH conditions is toxic to many species, particularly fish and invertebrates, and can affect their survival.[1,5]
	Aquifer	A geological layer of sand, gravel, or fractured rock that contains groundwater.[1]
ASR	Aquifer storage and recovery	Aquifer storage recovery (ASR) is a method for water management that involves storing water deep underground when it is available and recovering it when needed to meet water needs.[6]
	Attribute	Attributes are what we will measure in order to determine how healthy (or unhealthy) a water body is.[2]
	Attribute states/levels	Attribute states are numbers or narrative descriptions that convey a required level of an attribute to

[4] Source: www.lawa.org.nz/learn
[5] Source: Healthy Rivers/Wai Ora 2015 stakeholder workshop presentation (#3240949)
[6] Source: www.asrforum.com

		achieve a certain level of water quality health.[2]
B		
	Bacteria	A category of microorganisms. Some bacteria can be harmful to humans, such as *E.coli*.[1]
	Best practice	Best practice refers to procedures or practices that are accepted or agreed as being correct or most effective.[4] Best practice can evolve over time.
	Blue-green algae	*See cyanobacteria*
C		
	Campylobacter	*Campylobacter* is a type of bacterium that can cause intestinal infections.[5]
	Catchment	The total area of land draining into a river, reservoir, or other body of water.[1]
CEP	Community Engagement Plan	The CSG's Community Engagement Plan (CEP) sets out the course of action for the wider engagement process of the Healthy Rivers project. This includes proactively involving the communities who will be most affected by the plan change process. The current version of the CEP is available at www.waikatoregion.govt.nz/Council/Policy-and-plans/Plans-under-development/Healthy-Rivers---Plan-for-Change/Collaborative-Stakeholder-Group-/
	Chlorophyll A	Chlorophyll is a green pigment in plants that is used for photosynthesis and is a good indicator of the total quantity of algae present. [1]
	Collaboration	A collaborative process works with stakeholders to formulate solutions. In the Healthy Rivers project the CSG is where collaboration is most visibly present. The commitment the project partners have made to the CSG is that they will incorporate their recommendations to the maximum extent possible. This is consistent with the International Association for Public Participation spectrum, which can be found here – www.iap2.org.au/documents/item/84
	Contact recreation	Contact recreation is a term that covers two types of activities. Primary contact recreation refers to activities that involve full immersion, such as swimming. Secondary contact recreation refers to activities that have the potential for immersion or involve partial immersion, such as wading or boating.
	Contaminant	A pollutant that causes adverse change to a natural environment.[1]
COP	Code of practice	A code of practice (COP) is a set of suggested procedures for achieving best management practices
	Critical source areas	Areas of a farm or a catchment that are more likely to contribute contaminants than others.
CSG	Collaborative Stakeholder Group	The Collaborative Stakeholder Group (CSG) represents stakeholders and the wider community in the Healthy Rivers Project. They are the central channel for engagement in the process. Check out this page to learn more about the group – www.waikatoregion.govt.nz/Council/Policy-and-plans/Plans-

[1] Source: www.lawa.org.nz/learn
[4] Source: www.oxforddictionaries.com/definition/english/best-practice
[5] Source: www.who.int/mediacentre/factsheets/fs255/en/

		under-development/Healthy-Rivers---Plan-for-Change/Collaborative-Stakeholder-Group-/
	Cumulative effects	Effects on a receiving water body which are caused, at least in part, by the upstream section of that water body or inflows from another water body.
	Cyanobacteria	A group of bacteria that can photosynthesise like true algae. Unlike freshwater algae, some species of cyanobacteria produce toxins.[1]
D		
	Deposited Sediment	Layers of fine sand, silt and clay that have settled on the bottom of a water body.[1]
	Diffuse discharge	*See non-point source discharge*
	Dioxins and Furans	Dioxins and Furans are the short name for a family of toxic substances that all share a similar chemical structure. Dioxins and Furans can cause a number of health effects including cancer and changes in hormone levels.[6] In most cases, very low levels are found in plants, water and air.[7]
	Discharge	Discharge, in this context, describes the release of contaminants into the environment either directly into water, or onto land.[1]
DO	Dissolved Oxygen	The oxygen content of water. Dissolved Oxygen (DO) is important for fish and other aquatic life to breathe.[1]
	Drop in session	A drop in session is a way for stakeholders to learn more about the Healthy Rivers project and have an opportunity to provide feedback. Drop in sessions were a key part of the Healthy Rivers Intensive Engagement Period 1. Five evening drop in sessions were held in Tokoroa, Huntly, Hamilton, Otorohanga and Tuakau.
E		
	E.coli	*E.coli* (*Escherichia coli*) is a type of bacteria commonly found in the intestines of warm-blooded mammals (including people) and birds. *E.coli* naturally occurs in freshwater and is not usually harmful in itself, however, high concentrations of this bacteria can indicate faecal contamination which can be harmful to humans.[1]
F		
	Fish population measure	Fish population measures or stock assessments are a way to discover how fish populations have been affected. There are many ways to measure fish stocks.[8]
	Flow	Flow refers to the volume of water in the river flowing past a point in one second and is given in cubic metres of water per second (m^3/s).[1]

[6] Source: http://www.epa.gov/osw/hazard/wastemin/minimize/factshts/dioxfura.pdf
[7] Source: http://www.who.int/mediacentre/factsheets/fs225/en/
[1] Source: www.lawa.org.nz/learn
[8] Source: https://www.niwa.co.nz/fisheries/our-services/stock-assessments

FMUs	Freshwater Management Units	Freshwater Management Units (FMUs) are defined in the NPSFM as "the water body, multiple water bodies or any part of a water body determined by the regional council as the appropriate spatial scale for setting freshwater objectives and limits and for freshwater accounting and management purposes".[9] FMUs are areas the catchment is divided into to help us better manage water.
	Furans	*See Dioxins and Furans*
G		
	Geomorphic	Relating to the form of the landscape and other natural features of the earth's surface.[10]
	Giardia	Giardia is a food and water borne disease that is passed on in the faeces of infected humans and animals. Giardia is common and can live in rivers and lakes for long periods.[11]
	Groundwater	Water that is found beneath the land surface in pores and fissures in rock and soil. Underground zones where groundwater accumulates are known as aquifers.[1]
H		
	Healthy Rivers Wai Ora Committee	The Healthy Rivers Wai Ora Committee is a committee of the Waikato Regional Council. The committee is a co-governance arrangement between the project partners and is comprised of 5 Iwi Governors and 5 WRC councillors. The committee will make decisions on the plan change based on recommendations from the CSG.
	Heavy metals	Any metal or alloy with a density higher than 5 grams per cubic centimetre. Usually even at low concentrations, heavy metals are toxic to most plants and animals.[1]
HRWO	Healthy Rivers / Wai Ora Project	The Healthy Rivers: Plan for Change / Wai Ora: He Rautaki Whakapaipai project (Healthy Rivers / Wai Ora Project or HRWO) is working with stakeholders to develop changes to the regional plan to help restore and protect the health of the Waikato and Waipa rivers, which are key to a vibrant regional economy. Check out this page for more information – www.waikatoregion.govt.nz/healthyrivers/
I		
	Indicators	In the Healthy Rivers project, indicators refer to a potential secondary set of measures for water quality health, along with attributes. Indicators would not have limits or targets associated with them.
	Integrated assessment framework	In the Healthy Rivers project, the integrated assessment framework will look at the impacts of a range of targets and policies and provide information on the potential impacts.[2]
	Intensive engagement period 1	The Healthy Rivers intensive engagement period 1 took place from March-May 2015. The CSG led engagement via a large stakeholder workshop, drop in sessions and an online survey.

[1] Source: www.lawa.org.nz/learn
[9] Source: http://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/nps-freshwater-management-jul-14.pdf
[10] Source: http://www.oxforddictionaries.com/definition/english/geomorphic
[11] Source: https://www.health.govt.nz/your-health/conditions-and-treatments/diseases-and-illnesses/food-and-water-borne-diseases/giardia
[2] Source: Healthy Rivers/Wai Ora 2015 stakeholder workshop presentation (#3240949)

J		
K		
	Kaitiakitanga	Te reo Māori for the processes and practices of guardianship protecting and looking after the environment.[1]
	Koi carp	Koi carp are a strain of the common carp and are considered a pest fish in New Zealand. When they feed they stir up the bottom of water bodies, destroying native plant and fish habitats.[12]
L		
	Large stakeholder workshop	An all inclusive event that involves a large, diverse of stakeholders to engaging in a facilitated session.
	Leaching	The process by which contaminants are filtered through soil by water and often end up in rivers, streams, lakes and groundwater.[1]
	Limit	The National Policy Statement for Freshwater Management (NPSFM) defines a limit as the maximum amount of resource use available, which allows a freshwater objective to be met. Different water bodies may have different limits set according to how they are used.[1]
LUC	Land Use Capability	Land Use Capability (LUC) classification is a method whereby land is categorised into eight classes according to its longterm capability to sustain one or more productive uses.[13]
M		
	Macrophytes	Large water plants and algae that live in freshwater and are visible to the naked eye. Macrophytes can be either submerged, floating or emergent.[1]
	Mahinga Kai	Te reo Māori for indigenous freshwater species that have traditionally been used as food, tools or other resources.[1]
MAS	Minimum Acceptable State	Minimum Acceptable State (MAS) is defined in the NPSFM as "the minimum level, specified in Appendix 2, at which a freshwater objective may be set in a regional plan in order to provide for the associated national value".[9]
	Mātauranga Māori	Mātauranga Māori is a term that describes the body of knowledge originating from Māori ancestors, including the Māori worldview and perspectives, Māori creativity and cultural practices. Mātauranga Māori embraces individual, local and collective knowledge, Maori values, cultural expressions, perspectives, observations, being traditional, historical and contemporary. [2]

[1] Source: www.lawa.org.nz/learn
[12] Source: http://www.doc.govt.nz/nature/pests-and-threats/animal-pests/animal-pests-a-z/fish/koi-carp/
[13] Source: http://www.landcareresearch.co.nz/publications/books/luc
[9] Source: http://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/nps-freshwater-management-jul-14.pdf
[2] Source: Healthy Rivers/Wai Ora 2015 stakeholder workshop presentation (#3240949)

	Macroinvertebrates	Organisms without a backbone but large enough to be visible to the naked eye, e.g. insects, worms.[1]
MCI	Macroinvertebrate Community Index	The Macroinvertebrate Community Index (MCI) is an index where macroinvertebrates are used for monitoring stream health. The MCI assigns a score to each species based on its tolerance to organic pollution, from 1 (very tolerant) to 10 (very sensitive). The MCI then calculates the average score of all species present at a site.[1] A higher MCI score indicates a healthier water body.
	Microbes	Microbes (or Microorganisms) are tiny organisms that live abundantly in various environments, including water. Most microbes belong to one of four categories: bacteria, viruses, fungi or protozoa.[3]
	Mitigation(s)	In the Healthy Rivers project, mitigations refer to a range of practices that can help to improve water quality. Some examples of mitigations can be found here: http://www.waikatoregion.govt.nz/menus/
	Model/modelling	Models aim to make a particular part or feature of the world easier to understand, define, quantify, visualize, or simulate.[1]
N		
	Nitrate	A highly soluble compound of nitrogen and oxygen with the chemical formula NO3-. Nitrate is toxic to some species at very high concentrations and can affect their growth.[1]
	Nitrogen	Nitrogen is a chemical element with the symbol N. It can take several forms (nitrate, nitrite, ammonia and organic nitrogen). Nitrogen is a great fertiliser but too much of it can cause weeds and algae to grow too fast. This increased weed growth reduces oxygen in the water, posing a threat to aquatic life.[1]
NOF	National Objectives Framework	A national framework which guides regional decision-making in the setting of freshwater objectives (and subsequent limits). The National Objectives Framework contains 'national bottom lines' for attributes relating to two 'compulsory' values; ecosystem health and human health for recreation.[1]
	Non-point source discharge	Pollutants sourced from widespread or dispersed sources such as from pasture runoff of animal wastes, fertiliser and sediments, as well as runoff of pollutants from paved surfaces in urban areas. The term also covers the pollution that comes from an eroding river bank or seepage of soluble pollutants into groundwater. Non-point source discharges are also known as diffuse discharges.[1,9]
NPSFM	National Policy Statement for Freshwater Management 2014	The National Policy Statement for Freshwater Management 2014 (NPSFM) sets out the objectives and policies for freshwater management.[9] The NPSFM requires regional councils to manage water quality by setting objectives, limits and targets for all water bodies.[2]
O		
	Online survey	The Healthy Rivers Online Survey 1 was a survey that ran from 30 March to 30 April 2015 during the Healthy Rivers Intensive Engagement Period 1.

[1] Source: www.lawa.org.nz/learn
[3] Source: www.niaid.nih.gov/topics/microbes/pages/default.aspx
[9] Source: http://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/nps-freshwater-management-jul-14.pdf
[2] Source: Healthy Rivers/Wai Ora 2015 stakeholder workshop presentation (#3240949)

	OVERSEER®	OVERSEER® is a nutrient budgeting tool that supports farmers and growers to improve performance through better use of nutrients on farm and to reduce losses to the environment.[14]
P		
	Periphyton	Periphyton is the mix of algae, fungi, and bacteria that grow on the beds of our rivers, lakes and streams and turn dissolved nutrients into nutritious food for invertebrates.[1]
	Pest fish	Pest fish, including such fish as koi carp and catfish, are introduced species that have an impact on our water bodies. Amongst other effects pest fish can stir up sediment, increase nutrient levels, contribute to erosion and compete with native species. Once established, pest fish are very difficult to remove because they are able to spread through a whole river catchment.[15]
	pH	The degree of acidity or alkalinity as measured on a scale of 0 to 14 where 7 is neutral, less than 7 is more acidic, and greater than 7 is more alkaline. In the absence of contaminants most water bodies maintain a pH value that varies only a few tenths of a pH unit.[1]
	Phosphorus	Phosphorus is an element with the symbol P and is naturally present in water in low concentrations. When phosphorus levels increase to very high levels, the waterway is likely to experience rapid weed growth or an algal bloom.[1]
	Phytoplankton	Microscopic algae and cyanobacteria that drift or float in the water column and are able to produce oxygen through photosynthesis.[1]
	Plan change	*See Healthy Rivers / Wai Ora Project*
	Planktonic cyanobacteria	*See cyanobacteria*
	Point source discharge	Discharge of contaminants into a water body from a single fixed point, such as a pipe or drain from sewerage, factory and dairy shed outfalls.[1] Point source discharges, by nature, are much easier to identify than non-point source discharges.
	Project Partners	The Healthy Rivers project is a co-governance/co-management project between Waikato Regional Council and Waikato and Waipa River Iwi. The project partners are Maniapoto Māori Trust Board, Raukawa Charitable Trust, Te Arawa River Iwi Trust, Tūwharetoa Māori Trust Board, Waikato Raupatu River Trust and Waikato Regional Council.
	Protozoa	A category of microorganisms. *See microbes*
PSC	Policy Selection Criteria	The Policy Selection Criteria (PSC) are the filters the CSG will use to choose between different policy options.http://www.waikatoregion.govt.nz/PageFiles/36829/Draft%20policy%20selection%20criteria.pdf
Q		

[14] Source: http://overseer.org.nz/
[1] Source: www.lawa.org.nz/learn
[15] Source: http://www.doc.govt.nz/nature/pests-and-threats/animal-pests/animal-pests-a-z/fish/

R		
	Riparian	A strip of land that is directly adjacent to a water body and which contributes to maintaining and enhancing the natural functioning, quality, and character of the water body.[1]
S		
s32	Section 32 of the RMA	Section 32 (s32) of the Resource Management Act 1991 (RMA) provides a process for the critical evaluation of planning policy and proposals.[16] A s32 evaluation is required for the Healthy Rivers project as it involves a change to the Waikato Regional Plan.
	Scenarios	In the Healthy Rivers project scenarios refer to possible futures. The CSG will develop a range of scenarios. The TLG will provide the implications for each scenario through economic modelling and the integrated assessment framework. Using this information, and the Policy Selection Criteria, the CSG will evaluate potential policy options.[2]
	Sediment	Sediment refers to the small bits of soil, plant and/or animal matter that are transported by water, either in suspension or by movement in the river bed. Fine sediment can fill up the small spaces between rocks and make the habitat unsuitable for fish and macroinvertebrates to live in.[1]
SPI	Submerged Plant Index	The Submerged Plant Index (SPI) is a way of measuring macrophytes in lakes. The SPI can be used to assess, monitor and report on the ecological conditions of lakes.[17]
	Stormwater	Rainwater run-off that is channelled through drains from roads and urban properties into water bodies.[1]
	Sub-catchment	A section or part of a larger catchment. *See catchment*
	Survey	*See Online Survey*
	Suspended Sediment	Particles of silt, clay, or organic matter suspended in the water column.[1]
T		
TA	Territorial Authority	A territorial authority is a city council or district council.[18]
	Tannins	Tannins occur naturally and, where present, can stain water. For example the headwaters of the Waipa River are stained from by tea-coloured tannins from bush and wetlands.[19]
	Target	The National Policy Statement for Freshwater Management (NPSFM) defines a target as a limit which must be met at a defined time in the future.[9] Targets are timeframes in which limits must be met by. Different water bodies may have different targets.

[1] Source: www.lawa.org.nz/learn
[16] Source: http://perceptionplanning.co.nz/a-new-view-of-s32-better-rma-plan-making-2/
[2] Source: Healthy Rivers/Wai Ora 2015 stakeholder workshop presentation (#3240949)
[17] Source: https://www.niwa.co.nz/our-science/freshwater-and-estuaries/lakespi-keeping-tabs-on-lake-health/how-lakespi-works/lakespi-method-summary
[18] Source: http://www.stats.govt.nz/methods/classifications-and-standards/classification-related-stats-standards/territorial-authority/definition.aspx
[19] Source: http://www.waikatoregion.govt.nz/Environment/Natural-resources/Water/Rivers/Waipa-River/How-clean-is-the-Waipa-River/
[9] Source: http://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/nps-freshwater-management-jul-14.pdf

	Technical Alliance	In the Healthy Rivers project, the Technical Alliance is a group of technical experts that will provide information about the rivers and different land management scenarios. The Technical Alliance comprises of the Technical Leaders Group (TLG) and the Technical Support Group (TSG).[2]
TLG	Technical Leaders Group	In the Healthy Rivers project, the Technical Leaders Group (TLG) provides technical information and advice to the CSG and the project partners. The TLG, with the support of the TSG, will collate, summarise, analyse and present technical information.[2]
TN	Total Nitrogen	Total Nitrogen (TN) is a measure of all organic and inorganic forms of nitrogen that are found in a sample. High TN enriches water bodies with nutrients and cause algal blooms.[1]
TP	Total Phosphorus	Total Phosphorus (TP) is a measure of all forms of phosphorus that are found in a sample, including dissolved and particulate, organic and inorganic. High levels of TP in water bodies can encourage the growth of nuisance plants such as algal blooms.[1]
TRH	Te Rōpū Hautū	Te Rōpū Hautū (TRH) is the project steering group. TRH is comprised of executives from Waikato and Waipa River Iwi, WRC and the WRA. TRH provides project overview and direction.[2]
	Tributaries (Tribs)	A stream or river that flows into a main stem river or a lake rather than directly into a sea or ocean.[1]
	Trophic state	Trophic state is a measurement of water quality for lakes that highlights the nutrient status of a water body.[20] Waikato lakes range in trophic state from Oligotrophic lakes (clear and blue, e.g. Lake Taupo) to Hypertrophic lakes (supersaturated in phosphorus and nitrogen, e.g. Lake Hakanoa).
TSG	Technical Support Group	In the Healthy Rivers project, the Technical Support Group (TSG) is a group of technical experts who are available to support the technical work of the TLG.[2]
	Turbidity	Turbidity is an index of cloudiness of water. It measures the scattering of light caused by fine particles in our water bodies.[1]
U		
V		
V & S	Vision and Strategy / Te Ture Whaimana	The Vision and Strategy for the Waikato River/Te Ture Whaimana o Te Awa o Waikato (V&S) is the primary direction setting document for the Waikato and Waipa rivers. The V&S is set by the WRA. The Vision "is for a future where a healthy Waikato River sustains abundant life and prosperous communities who, in turn, are all responsible for restoring and protecting the health and wellbeing of the Waikato River, and all it embraces, for generations to come".[21] To read the V&S in full see: http://versite.co.nz/~2013/16230/#1

[2] Source: Healthy Rivers/Wai Ora 2015 stakeholder workshop presentation (#3240949)
[1] Source: www.lawa.org.nz/learn
[20] Source: https://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/Protocol%20for%20monitoring%20trophic%20levels%20of%20New%20Zealand%20lakes%20and%20reservoirs.pdf
[1] Source: www.lawa.org.nz/learn
[21] Source: http://www.waikatoriver.org.nz/about-the-waikato-river-authority/purpose/

W		
	Wastewater	A by-product of sewage, liquid trade waste collection, and treatment processes.[1]
	Water body	A river, lake, stream, pond, wetland, or groundwater.[1]
	Water clarity	Water clarity refers to the ability of light to travel through water and has two important aspects: light penetration and visual clarity. Light penetration is important as it controls the amount of light in the water needed for aquatic plants to grow. Visual clarity indicates how much suspended sediment is in the water.[1] Water clarity is proposed to be an attribute for the Healthy Rivers project.
	Working list of values and uses	The CSG's working list of values and uses lists the outcomes communities want to achieve from freshwater management. Freshwater will be managed to achieve these values and uses. [2]
WRA	Waikato River Authority	The Waikato River Authority (WRA) is the custodian of the Vision and Strategy (V&S). In addition to safeguarding the importance of the V&S the WRA also funds projects that contribute to restoring and protecting the health and wellbeing of the rivers and their catchments.[21]
WRC	Waikato Regional Council	The Waikato Regional Council (WRC) is the local government body that is tasked with the governance and management of natural resources and regional scale planning for the Waikato region.[22]
WRISS	Waikato River Independent Scoping Study	The Waikato River Independent Scoping Study (WRISS) was a project that identified priority actions and the associated costs of those actions necessary to rehabilitate the health and wellbeing of the Waikato River and its tributaries, wetlands and lakes for future generations.[23]
Y		
Z		

[2] Source: Healthy Rivers/Wai Ora 2015 stakeholder workshop presentation (#3240949)
[22] Source: http://www.waikatoregion.govt.nz/PageFiles/35302/AboutWaikatoRegionalCouncil.pdf
[23] Source: https://www.niwa.co.nz/freshwater-and-estuaries/research-projects/waikato-river-independent-scoping-study-wriss