

Tweed District Water Supply Augmentation Project A report by the Community Working Group

March 2010

TWEED SHIRE COUNCIL | TOGETHER FORWARD

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Introduction

The Water Supply Augmentation Project

Four short-listed options are being assessed to determine a preferred option to increase the future capacity of the Tweed's water supply. Council has invited the community and the Community Working Group to comment on the short-listed options, the proposed Multi-Criteria Analysis process, any deficiencies or consultation gaps, and help to identify the environmental, social and cultural impacts of each of the options and how each might be managed. The object of this phase is to determine a preferred option for adoption by Council in mid 2010.

The Community Working Group (CWG)

The Tweed Shire Water Supply Augmentation Community Working Group (Community Working Group, or CWG) was established by Tweed Shire Council. It consists of members of the Tweed Shire community and aims to be a representative cross-section of the Tweed Shire community.

CWG Members were selected from a large number of nominations received from residents of Tweed Shire. The members representing residents, environmental, business and catchment user groups were selected by an impartial selection panel from Southern Cross University (SCU) according to predetermined selection criteria. The remaining representatives were nominated directly by their stakeholder group.

The CWG's aim was to assist Council to select a preferred option from four shortlisted water supply augmentation options. The role of the group was to investigate the options in some detail, collect and disseminate information with stakeholders and the wider community, and to work with Council to identify the key environmental and social issues associated with each option. The CWG met to discuss and deliberate these issues during five meetings held between 1 December 2009 and 1 March 2010.

Drafting of this Report

This report for consideration by Council contains a summary of the group's recommendations together with the views, interests and issues of individual CWG members.

The drafting of this report has been undertaken by the CWG through the following process:

- Each CWG member identified significant issues and drafted comments accordingly
- All comments were grouped and listed under relevant subheadings
- Each CWG member was invited to nominate the most important comment or comments under each subheading by marking the comments with sticker dots
- Comments were ranked under each subheading according to the degree of support
- Generally the top three comments were retained within the "CWG Recommendations" section of this report. Other comments are listed in the "Additional Comments" section of the full report.
- Objections by CWG members who were not comfortable with one or more of the comments retained in the "CWG Recommendations" section of the report are listed within the relevant section.

CWG Recommendations

Options Assessment

The CWG has been asked to provide information on the environmental and social aspects which will assist Council compare the options using the Multi-Criteria Analysis (MCA) assessment tool.

For each of the short-listed options, the CWG members were asked "Can I live with this option?". Council will use these responses to inform the process of determining MCA ratings for each of the options.

CWG members were also asked "Are environmental or social issues more significant?". Council will use these responses to inform the process of determining MCA weightings for the social and environmental criteria.

Ratings

Assessment

CWG members compared the environmental impacts of the options by nominating whether or not "I can live with" each option and why. The table below summarises the results and the reasons for each member's view. Members were not obliged to give their opinion.

OPTION	Raise Clarrie Hall Dam	New Byrrill Creek Dam	Pipeline to SEQ Water
l can live with this option because:	(9 Total) CHD 2 nd option Has further considerations to volume and water quality Tolerable with full EIS and mitigation options Least damaging Support, proviso – effective relocation of Aboriginal Cultural Heritage sites - Wildlife corridors - In tandem with contingency options Existing footprint – Still ecologically bad CHD 1st option CHD Environmental less damaging than other options Minimum impact - Maximum outcome Easiest less invasive \$8m on spillway not wasted even some positive	(2 Total) BCD 1 st Option Byrrill Creek No 2 option	(1 Total) High greenhouse/carbon but minimum ecological

Table 1: Environmental Impacts of the Options

OPTION	Raise Clarrie Hall Dam	New Byrrill Creek Dam	Pipeline to SEQ Water
I don't know / am not sure	(1 Total) CHD is a last dam option subject to Council reusing available water	(0 Total)	(6 Total) Not enough information - actual application seems unlikely under current political stands. Insufficient detail on options and environmental impacts No agreement yet with QLD government Piped water supply uncertain Waiting for qualifiers Could have Aboriginal Cultural Heritage impacts
l cannot live with this option because:	(1 Total) Too much habitat destruction – koala habitat, gullies and farmland	(8 Total) High conservation value Not sustainable - Old Practice - Illegal under Draft WSP Don't support Environmentally protected catchment - In prohibited dam area Death for the Valley Many species under threat and Greenhouse gas Too high environmental conservation status on vegetation and fauna Ecological significance Unacceptable loss of high environmental values	(3 Total) SEQ No Option Not an option due to ongoing costs and political Can't support GHG or marine destruction

CWG members compared the social impacts of the options by nominating whether or not "I can live with" each option and why. The table below summarises the results and the reasons for each member's view. Members were not obliged to give their opinion.

OPTION	Raise Clarrie Hall Dam	New Byrrill Creek Dam	Pipeline to SEQ Water
l can live with this option because:	(6 Total) Minimal impact socially - intact landholders needs to be met. CHD already damaged Least affected willingness of locals for shire benefit Community understand and have made provisions for the impacts. Support CHD 2 nd Option More acceptable to increase dam wall height than a new dam at Byrrill Creek	(2 Total) Support BCD 1 st Option Number affected will benefit the whole shire with secure water supply	(1 Total) People will support it

 Table 2: Social Impacts of the Options

OPTION	Raise Clarrie Hall Dam	New Byrrill Creek Dam	Pipeline to SEQ Water
I don't know / am not sure	(2 Total) Don't believe we have adequately canvassed social impacts to distinguish between options Data about compensation	(1 Total) Don't believe we have adequately canvassed social impacts to distinguish between options	(5 Total) Piped water supply uncertain SEQ – Politically unacceptable Least social impact compared to Dams but environmentally unacceptable Blank sheet (no comment) Insufficient info on SEQ option
l cannot live with this option because:	(1 Total) Sacred sites flooded, farmers lose prime land or is cut up income lost	(6 Total) Valley people and accesses torn apart total decimation People will oppose it vehemently Don't support: High ecological area required for future generations BCD loss to future generations of a major ecological asset Sacred sites, too many homes lost main access lost. Too much dislocation of community.	(2 Total) Can't justify power use and marine loss Short sighted unsupported by other parties. Many residents will be affected through this development

General Discussion

The group considered that these results showed:

- There's a trend
- More information is required to adequately assess the Pipeline to SEQ Water.
- The Clarrie Hall Dam is preferred over the Byrrill Creek Dam if one of these options proceeds
- Social impacts are not as big an issue as environmental impacts

We need to look at worst case scenarios and make the tough decisions required to ensure we plan for access to water for all.

Council's decision should emphasise the big picture and focus on the good of the entire Shire now and into the future.

I don't think any of these options are suitable & cannot be classified using an MCA.

<u>Clarrie Hall Dam</u>

It is better to impact on environmental and social values which have already been compromised, however being mindful of the people and environmental values which will be affected.

By raising Clarrie Hall dam, Byrrill Creek will remain an environmental asset to the Shire.

Least impact option and takes care of the required spillway fix.

Byrrill Creek Dam

Too high Social, Cultural Heritage & Environmental problems to be considered an option.

Byrrill Creek is designated as being of high conservation value including high diversity of Schedule 1 &2 wet fauna species and very high diversity of wet flora species by NPWS (DECC) in the Stressed Rivers Assessment Report. Conservation of Biological Integrity is about preserving natural areas of High Conservation Value for their intrinsic worth. Byrrill Creek is one such area.

<u>Pros</u>

- Alternative catchment of rain
- Council owns most of the land
- Clean catchment, surrounded by State and National Parks
- Water supply security
- Reduced compensating costs
- Quality in sourced water

<u>Cons</u>

- Area is HCV
- Local lifestyle disturbances
- Best location for rehabilitation.
- New road alignments required.
- Rehabilitation works done.

Toughest choice, but in terms of long term water security this may be our best option.

Byrrill Creek Dam is contrary to state policy of no more dams and every effort must be made to protect the environment. It is more expensive than CH Dam and will have a lower capacity.

If council approved the Byrrill Creek dam option, a high conservation area would be lost to future Tweed generations, as a place of beauty and tourist destination for visitors.

Pipeline to SEQ Water Grid

Pipeline to SEQ very difficult politically and too many legislative problems. Plus large ongoing pumping cost, large carbon footprint, enviro problems (linked with Tugun Desal Plant) and Cultural Heritage problems.

Ratings for the pipeline options should reflect the whole water supply system enabled by the pipeline linkage, not just the pipeline itself. Eg the energy costs associated with the SEQ pipeline regardless of whether this is adequately reflected in any contractual arrangement.

SEQ will be dumping their waste (brine) on our doorstep. Desalination plants are a death sentence to marine life and power usage exacerbates the already fragile/unredeemable GHG situation

When SEQ water Grid Manager has not guaranteed supply of bulk water supply why does the WaterTweed project persist with failed Pipe options when other more suitable side options for water supply are available?

Contingency Option

Groundwater : Cultural Heritage problems , Enviro problems: impacts on greater water table unknown & Farmers don't want it. Rous Water doesn't have enough water for themselves let alone share it.

When Rous Water has not guaranteed supply of bulk water supply why does the WaterTweed project persist with failed Pipe options when other more suitable side options for water supply are available?

The CWG cannot recommend this option as it is a contingency.

Weightings

Assessment

CWG members compared the environmental and social criteria and nominated which is most significant and why. The table below summarises the results and the reasons for each member's view.

CRITERIA	RESPONSE
ENVIRONMENTAL	(6 Total)
	80,000+ are coming here in future because of the environment. Concrete and highrise are not attractive
	ENV (5) > SOC (3) – it is finite irreplaceable resource
	Save the environment - secure the yield – its all important
	Blank sheet (no comment)
	Sacred site, 60,000years of history. Why do we all live here? – heritage site, a special beautiful environment
	Society is only a part of the environment
вотн	(6 Total)
	Inter-related
	Environment equally important / Socials is important – to save more available water is good for the environment
	Both important – water most important
	Both related
	Environmental issues have given us the society we have today. To drastically alter the environment will impact on the society, creating extreme social unrest.
	I won't have the luxury of being single issue focussed. I started the argument for the sake of it. Truth is I cannot separate one from the otherI have so much more to uncover, investigate, learn and quite possibly have a ball over. However I am going to have to make a decision and I will, when I have all the info.
SOCIAL	(0 Total)

Table 3: Are Social or Environmental Criteria more significant?

Discussion

Within the CWG no one feels that the social criteria are more important than the environmental criteria. Six members feel environment should be weighted more heavily, while six members believe social and environmental issues should have equal weightings.

We live in an area which has world heritage status – The environmental significance is what drew people here in the first place (over millennia). We have a sacred mountain in the middle. We must preserve it – to destroy it is mindless.

If there is no environment - there is no society

Environment is the most important factor. We have got available water here now without a dam option. These aren't the only options. It is a complex problem. Social in terms of more people to the valley is highly critical decision – environmental are we going to destroy a pristine area. Both are exceedingly important.

General consensus: we can't have one without the other.

Process review and further work focus

Assumptions or givens

Population projections

The CWG is concerned that the water supply augmentation options process is premised on population growth predictions that the CWG is not able to assess the validity of.

Success of demand management

The CWG would like assurance that Tweed SC's demand management strategy is benchmarked against national and international standards, and undergoes independent assessment to demonstrate this, otherwise a needless Dam option could proceed.

Large scale Recycling, Storm Water Harvesting & Large Water tanks are the only environmentally & socially sustainable way forward for Tweed Shires Water Management

Better marketing of the TSC Integrated water management strategy as a holistic package, and reducing the dominance of technical literature, are required so the Tweed community better understand the steps being taken to conserve, protect and augment the future needs of the Shire.

Adequacy of the evidence base

From the evidence we have Byrrill Creek must be removed from the list of viable options.*

Dams all have problems with water quality and emissions but we have not been given guidance on this.

The CWG has not seen any evidence of how Tweed SC has considered climate change scenarios and impacts in their decision-making process.

* one CWG member wished to register an objection to the inclusion of this statement

Scope and focus

Other options beside dam construction have been inadequately addressed and show a lack of willingness/innovation to adopt other water saving and storage issues (storm water retention, recycling).

There are no figures on environmental cost. The cost of water recycling and dam construction cannot be fairly compared until environmental costs are incorporated into the overall dam costs.

The Multi-Criteria Analysis (MCA)

The overall list of criteria seems reasonable. However the process does not seem to have adequately considered climate change adaptation and mitigation.

A replacement value and opportunity cost need to be factored in to better reflect the environmental value. Dollar values are a coarse measure of environmental worth but would assist in making a fairer assessment between options. Once true environmental costs have been assessed the planning process needs to revisit the coarse screening model and re-evaluate \$/ML

We as a group have learnt a huge amount from each other; some good (how hard working and honest the water dept guys are) and some bad (how politics plays more of a part in decision than does reason).

Community Consultation

Process and starting point

Full Environmental Impact Assessments needed to be carried out PRIOR to any decisions on the short-listed options to determine the preferred option.*

ALL OF THE NINE OPTIONS should have been part of the so called community consultation from the beginning.**

The CWG has felt constrained by the timing and time constraints, data limitations and focus of community input on ratings of 2 specific criteria (environmental and social) for 3 predetermined water supply options.***

* one CWG member wished to register objection to the inclusion of this statement; they believe correct approach was taken - not spending excessively by studying lots of options in depth with the preferred decision based on available information.

** three members wished to register objection to the inclusion of this statement; one felt there was already too much information to comprehend, one felt it is impossible to go to the public with more options, one believed it was a sensible place to start.

*** two CWG members wished to register objection to the inclusion of this statement; they did not feel constrained

Effectiveness, efficiency and appropriateness

I do not support any of the options without first demonstration by council of tangible benefits in water management and recycling.

Community consultation has not been properly achieved within the CWG : items many members wanted to discuss meaningfully were not allowed, or "that we would look at them later" (which didn't happen) & the "Agenda" took precedence

The purpose if the CWG is not to make a decision but to provide information to council to help *them* make a decision. It has been made clear that advice and information from members of the CWG is not relevant or difficult to incorporate into the decision making process.

Broader Community Input

The CWG fully supports Council's desire to engage the community in the Tweed Water Supply Augmentation decision-making process.

Joanna has done far more consultation with the broader community than TSC eg Survey, Uki Meetings, Byrrill Creek Meetings, Newsletters & 100's of emails

The process I feel has been tokenistic, due to the late involvement – and limited involvement, of the community

Appropriateness of Information supplied

Tweed SC has been very forthcoming in sharing data and information with the CWG.*

Council has provided as much data as it could have given the limited time.*

* one CWG member wished to register objection to the inclusion of these statement.s

Suggestions for future community engagement

Majority of Community only speak out when there is something to complain about - So just implement radical water saving devices in each new development and rebate incentives for retrofitters

Needed a mechanism to better engage the broader community who are generally complacent unless you discuss with them directly.

While the CWG has learnt a lot from the process adopted, the CWG felt uncomfortable speaking on behalf of the whole Tweed community, and encourages Council to seek additional ways to engage the whole community in this process in the future.*

* four members wished to register objection to the inclusion of this statement; they all felt comfortable representing their particular stakeholder groups.

Future work / Change of focus

Alternative water sources

Other bulk water supply options identified in the National Water Initiative (NWI) Australian Water Reform 2009 and not included in the coarse screening include: harvesting of bulk stormwater and maximised use of greywater systems and reuse of purified water

With all the advice that we are getting on global warming and consequent climate change we need a very open mind on recycling water, whilst bearing costs in mind.

Water Recycling before DAMS*

* one CWG member wished to register objection to the inclusion of this statement.

Qualifications

Planning for Water Supply

Contingency options should be reviewed every two years especially where new innovations in water recycling and use come on line and evidence that they are economically feasible to apply.

Management Plans

State and National water flow requirements will have to be adhered to, and adjusted accordingly.

At CHD the denudation of vegetation should be done by barge to reduce the need for further road infrastructure, which creates more environmental damage.

At CHD an emergency plan should be established for the village of Uki, and surrounding areas if the dam should fail; including during construction.

Environment

Unless water quality improves the Tweed River waterways will become 'terminally ill'. Improved environmental flows together with less contaminating water discharges to the River system are required to allow residents to enjoy a healthy Tweed River.

The Tweed community is concerned that council is taking too little action in the total water cycle of new satellite cities which are expected to accommodate a predicted 76198 persons by 2036.

There needs to be a more thorough investigation of the cost. Without that the initial coarse screening is biased. The current options of the dam, and their associated costs mean that the environment (and people's houses) are subsidising urban water use – and wastage.

Population Policy

Water and population need to be linked. Without considering population growth in the context of ultimate resource scarcity, that is acknowledging there is a finite limit of water available to be trapped in the system (which can support a fixed number of people).

Population growth at current levels is unsustainable. The current urban model is flawed.*

With controlled land release, money could be set aside for the best long term option rather than expediency.

* one CWG member wished to register objection to the inclusion of this statement; they believe it can be examined so as to be sustainable.

Town Planning

The best elements of urban planning need to be adopted by TSC (why can't TSC be leading edge?) in tandem with maintaining and enhancing the environmental values of the region.

Enlightened LEP addressing the future needs of community and the environment. The Tweed Shire LEP should address the issue of preserving why people live or would wish to live in the Tweed. This includes those values, both environmentally and socially, which will be destroyed for future generations through a develop or bust approach, filling the pockets of a parochial few at the detriment of the greater good to meet their demands.

Miscellaneous

The current ratepayers will be paying for the future water users. A separate charge should be imposed on the new developments for the additional costs involved with the upgrade of the water supply.

Concerns over compensation because the last time (at CHD) the council were, to say the least, economical with the truth.

Additional Issues and Comments

Individual comments which received support (dots)

Ratings

Clarrie Hall Dam

The uniqueness of this area ought not to be further degraded and so all dam options should be given the lowest rating.		Sam Dawson ●●●●
Easiest choice for now – path of least	resistance.	Pryce Allsop ●●●
The only option where all other conting	gencies fail. The last card in the pack.	Rob Learmonth ●●
Pros Secure water supply Reduced costs Least environmental damage	<u>Cons</u> Loss of private land Environmental loss Road access changes	Robyn Lemaire ●●
Interrupted Tweed River Environmenta quality below Bray Park Weir	al flows are adding to the poor water	Richard Murray ●●
CH Dam area already damaged, less people to move, but people already disturbed will have their lives disrupted again.		Tony Thompson ●●
CHD landholders were burdened last t others. CHD may be burdened again	ime. Its time that burden passes to in 30 years time if raised then.	Don Beck ●●
Too high Social, Cultural Heritage & Environmental problems to be considered an option		Joanna Gardner ●
'Raising the existing Clarrie Hall dam' is likely to cause adverse environmental affects and loss of Aboriginal Cultural Heritage sites.		Richard Murray ●
Water quality issues in the existing Clarrie Hall Dam, in the Tweed River at Bray Park Weir are unsatisfactory.		Richard Murray ●
Fair financial compensation will be acc landholders.	ceptable to most of the affected	•

Byrrill Creek Dam

The High Conservation Value makes this a very difficult option, both locally, and on a National level.	Robyn Lemaire ●●●●
Council owns a large proportion of the land. The land was purchased with	Robyn

intent to be used as a dam. It has been local knowledge for 30 years.	Lemaire
No Dam – Leave as is for all to enjoy as nature intended. Should never be done.	••••
Valley will be split and community divided since road relocation is unlikely due to excessive economic and environmental costs.	••••
The construction of a dam in Byrrill Creek does not meet either State and Commonwealth government guidelines in terms of ESD. So why is the option there?	Rob Learmonth ●●●
Out of the 4 decisions 2 are "no`s" and of the other 2 dam options, Byrrill Creek is in direct opposition to our state govt policy on several points.	Tony Thompson ●●
Threat to Tweed Shire Environmental Values. Potential destruction of High Conservation Value areas in Byrrill Creek Catchment and impacts on the current residents.	Rob Learmonth ●●
Road cut will result in loss of tourism and tourist ring road	••
The forestry plantations have economic value, and these have a benefit to the Shire financially, and in regards to carbon emissions.	Robyn Lemaire ●●
It will be very difficult to compensate for the area to be inundated at BCD.	Robyn Lemaire ●●
How will we fit into the Regional, State, or National Water Plans?	Robyn Lemaire ●
The quality of the water in this catchment would be very high due to the surrounding National Parks. There are few landholders to deal with along the water line, reducing control costs.	Robyn Lemaire ●
Byrrill Creek dam ought to have the lowest ratings of all options due to its high environmental and cultural significance	Sam Dawson ●
NSW Weirs Policy discourages construction of on-river storages – i.e. no new weirs or dams.	•
Minimum social impact relative to the betterment and future betterment of the entire Shire.	Don Beck ●

Pipeline to SEQ Water Grid

Pros	Cons	Robyn
Cheap	Need approval to get the water	Lemaire
Saves building dams	Only for new developments along the	$\bullet \bullet \bullet$
Quick fix	coast	
Doesn't require storage facility	Doesn't secure supply	
Low environmental impacts	No options for water treatment	
	Needs to be maintained	

'A Pipeline to the SEQ Water Grid' has been accurately described in recent press reports as 'Pipedreams'.	Richard Murray ●●●
Desalination Plant environmental disaster	Colleen Edwards ●●
In time of need (drought) it may not function	Colleen Edwards ●●
We have had no affirmative response to access their system. How naive are we?	Colleen Edwards ●
This ought to have a high environmental rating but a low Greenhouse gas rating	Sam Dawson ●
The three SEQ pipeline route options are just too vague to be included in this Question Quantifier and have been described in the press as 'Pipedreams"	Richard Murray ●

Contingency Option

Not a long term solution to the supply requirements of our population.	Robyn Lemaire ●●●●
However the use of groundwater is questionable and needs to have a low environmental rating.	Sam Dawson ●●●
Too many problems to be considered an option	Joanna Gardner ●●●
Unreliable	Colleen Edwards ●
The pipeline to Rous Water remains an unconfirmed water supply	Richard Murray ●

Weightings

The environmental aspect is more important because we have had it wrong	Colleen
so many times in history. Rather than greed, sit back wait and let it reveal	Edwards
itself.	●●●●
Mebbin National Park was known as Mebbin Forest and prior to that it was a dairy farm. The environment comes back. If there was a dam built the environment would come back. We need to make a decision here for all the Tweed Shire. Both issues are important for the whole of the valley.	Don Beck ●●●●

There needs to be the balance – environmental values enhanced by local LEP aimed strongly for environmental - yet realise the social impact. He believes innovative planning should embrace both.	Rob Learmonth ●●●
We came here for the environment – it is a finite resource fantastic environmental global track of over exploitation.	Rachel Ebhard ●●●
Social is more important because we can assist with nature and work with it - if we have everything in balance and work together as a co-operative society we can work together but not if we're killing each other for water.	Dot Holdom ●●
Socially we have to look that we will have 80-90,000 people plus we must have certainty for the environment.	Phil Youngblutt ●●
It is not an easy answer – Environmental is important. Social is so "spread out" – If I had long-term roots here I would be upset if my family was buried where it was to be flooded. But do we want water in the future - yes we do. It's tough.	Pryce Allsop ●●
It is a complex problem. Social in terms of more people to the valley is highly critical decision – environmental are we going to destroy a pristine area. Both are exceedingly important.	Richard Murray ●●

Assumptions or givens

Adequacy of the evidence base

The CWG has concerns that the available data and information is not sufficient to support the MCA analysis that takes Council from 9 coarse screening options to the 4.	Joanna Gardner ●●●
The attention of Council is drawn to the importance of the assumptions described above, and the uncertainty in population growth, the implementation of the demand management strategy and climate change scenarios.	Rachel Eberhard ●●●
The CWG has been unable to adequately assess the contingency option due to insufficient information and time.	Rachel Eberhard ●●
The construction cost estimates supplied have not given adequate consideration to relocating roads and compensating landholders.	Colleen Edwards ●
I question the assumptions made about community preferences and the size of rainwater tanks.	Sam Dawson ●

Scope and focus of the Assessment

Limited number of well thought out options - Lack of rigour in exploring other	Rob
options.	Learmonth
	•

The Multi-Criteria Analysis (MCA)

The CWG acknowledges the complexity of the issues involved in considering the trade-offs inherent in these decisions.	Rachel Eberhard ●●●
No feed back from indigenous group. Their views could considerably change our ratings.	Tony Thompson ●●
The ratings should be from 0 to 10 to give a finer approach, with 0 being an absolute no.	Tony Thompson ●
The MCA Process was discovered on 1970 and it has been considerably refined since. For complex group decisions we should be using AHP or Analytic Hierarchy Process where each decision is broken down into sub problems, pairs of sub headings are then compared with each other and given a rating. May need a computer programme to do the calculations. From my research this is a far more sophisticated way to go.	Tony Thompson ●
Using the MCA forces our decisions into a neat box for a report and is meaningless without clarification, & discussion.	Joanna Gardner ●
The MCA weightings and ratings are too coarse to gauge the finer details and disparities between the areas. It is not an adequate tool to make a qualified recommendation about the choices.	Sam Dawson ●
The input for the MCA needs further community consultation over an extended timeframe	Sam Dawson ●

Community Consultation

Process and starting point

CWG meetings have left most of the group with a sense of being rushed into choices we do not necessarily want. Discussion has been cut short and we end up playing games to give a poor visual impact of things we already know.	Richard Murray ●●●
The most revealing item that has transpired through the process is the lack of any real choice to be made by the group.	Sam Dawson ●●●
Correct approach not spending excessively on lots of options - coarse screening was done first and the preferred decision is based on available information.	Pryce Allsop ●●
All along we have been boxed in to not look beyond supply, which is absurd.	Joanna Gardner ●

Effectiveness and appropriateness

The Field Visit was good; it put things into perspective	Joanna
	Gardner

	•••
The role of the CWG has been unclear throughout the working group process and this has constrained our effectiveness.	Rachel Eberhard ●●
The Time span has been ludicrous for meaningful consultation from the beginning to the end	Joanna Gardner ●

Suggestions for future community consultation

Decisions when rushed like this reinforce a sense of predeterminism.	Sam Dawson ●●●
I would suggest that members that wish have a meeting at which a method for future groups can be hammered out.	Tony Thompson ●

Future work / Change of focus

Alternative water sources

Council needs to meet the NSW govs BEST PRACTICE GUIDELINES for sewage and water management	Sam Dawson ●●
Priorities for demand management: Rebates for fitting recycled water units 'User pays water pricing" should be charged on a steeper sliding scale. 10kl water tank per bedroom in new developments	Colleen Edwards ●●
20 000 L rainwater tanks need to be made obligatory for all existing and new developments as this will promote independence and self reliance	Sam Dawson ●
It has been made apparent that Interbasin Water Transfers are not a solution to water issues. They merely subsidise wasteful practices and stifle development of new initiatives.	Sam Dawson ●

Qualifications

Planning for Water Supply

The CWG has concerns that climate change mitigation ie reducing greenhouse gas contributions and adaptation ie managing the impacts of	Rachel Eberhard
predicted increased temperatures and evaporation, and possible changes to rainfall and extreme rainfall events.	••

Management Plans

Buffer zones will have to be enforced to maintain water quality.	Robyn Lemaire
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<u>Environment</u>

This community of the Tweed Shire by and large support greater environmental initiative than are currently being proposed	Sam Dawson ●●
MORE funds are needed for river health improvement	Sam Dawson ●

Population Policy / Town Planning

Virtually no-one wants to double the Tweed`s population	Tony Thompson ●●
There is not a comprehensive plan to attract industry, expand hospital, rail link to airport or even for parking. THESE ARE THE FIRST QUESTIONS TO ASK.	Tony Thompson ●●
Green field sites must not be used especially the likes of Kings Forest which the federal Govt has identified as being subject to inundation within 50 to 100 years.	Tony Thompson ●●
Listen to the residents of Tweed Shire: Community Water Survey indicated 83.64% didn't want population doubled, 94.3% didn't want high density development ,& 91.2% wanted population limited to suit available water supply	Joanna Gardner ●

<u>Miscellaneous</u>

We are all "guilty" of using this infrastructure and resource either directly in our homes or intrinsic in the products and services we use.	Pryce Allsop ●●
Local employment is preferred to keep our money in the Shire.	Robyn Lemaire ●●
Would it be possible to dredge some of the upper reaches of the dam, so that a channel keeps the water moving, excavating the central flatter areas to improve storage capacity.	Robyn Lemaire ●

Other Individual comments

Other points which received no supporting dot stickers.

Ratings

Clarrie Hall Dam

The Environmental ratings at Clarrie Hall need to represent the loss of Threatened ecological communities, and species lost and should be low	Sam Dawson
Only person potentially going to lose his home is accepting of that.	
A road detour would not have a significant negative impact on those affected. A greater number of residents will benefit from shorter travel times.	

Byrrill Creek Dam

To postpone the development of Byrrill Creek Dam will only act as a deferment. The location, and proportion of the population concerned, brings us to the cost of a few for the benefit of the whole.	Robyn Lemaire
The uniqueness of this area ought not to be further degraded and so all dam options should be given the lowest rating.	Sam Dawson
Positives include better roads to the area, improved amenities such as picnic tables for social and tourism needs. Dam will become a social focal point.	Don Beck
Bite the bullet now. Utilise the benefits of Council's foresight and then State government's support.	Don Beck
A new dam at Byrrill Creek is not acceptable due to Byrrill Creek's high conservation value in vegetation and fauna.	Richard Murray
Residents who don't want to leave will lose their homes.	

Contingency Option

Contingency not really an option as it has low an unreliable yield.	Tony
	Thompson

Weightings

If you change the environment you will change the social implications -	Robyn
people will move away.	Lemaire

Environmental

Environmental constraints should have equal weightings to secure yield	Joanna Gardner
Issues to be considered: Threatened Ecological Communities and endemic species. Habitat connectivity. Loss of national parks	Sam Dawson

<u>Social</u>

Social constraints should have equal weightings to secure yield Jo	Joanna
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	Gardner
Issues to be considered: Indigenous cultural heritage is irreplaceable, Relics of European settlement, The connection to place that has developed in the contemporary community, Attitudes towards environmental destruction	Sam Dawson

Other MCA weightings

Secure yield and the cheapest option is really all that is being looked at!	Joanna Gardner
Cultural Heritage constraints should have equal weightings to secure yield	Joanna Gardner
Greenhouse gas emission constraints should have higher weighting	Joanna Gardner

Assumptions or givens

Population projections

No figures given to group. This is an area of failure to think collectively for the council. In many parts of say the Gold Coast, Mid North Coast there are numerous problems for uncontrolled development.	Tony Thompson
Council's predicted population is substantially based on future subdivisional planning representing an increase beyond 3% annually. The present rate of growth of Australia's population is quoted as being 1.8 percent per year.	Richard Murray

Success of demand management

The CWG is concerned that it is not able to assess the validity of the water use assumptions and council's demand management strategy that underpin the water supply augmentation decision process.	Rachel Eberhard
Most important that Council does focus on and carry out the Demand Management it says it will.	Colleen Edwards
Conflicting information between Council's: Demand Management Strategy Versions 2008 and 2009; Drought Management Strategy April 2009 and other documents make water supply and demand a complex issue.	Richard Murray
More aggressive Water Demand Management should accompany whichever option becomes the preferred option.	Colleen Edwards
Option 1 plus caveat of water management strategies should provide an ongoing solution	

Adequacy of the evidence base

The CWG has concerns that the available data and information (particularly social and economic information, but potentially also other criteria) is not sufficient to support the MCA analysis that takes Council from 4 short-listed options to 1 preferred option.	Rachel Eberhard
The evidence is more than adequate but is unfortunately unable to be easily interpreted. There are many questions about the assumptions made in the	Sam Dawson

DMS reports such as water consumption and consumer preferences.	
There is not enough evidence about the environment at either dam site to recommend an option.	Sam Dawson
There needs to be a review of council figures to assess their veracity	Sam Dawson

Scope and focus of the Assessment

The coarse selection of bulk water supply options was considered to be inadequate, with too few similar Dam choices and no regard to other more suitable bulk water supply choices.	Richard Murray
Incredibly, the singular 'Direct potable use' (Option 9) became a main Tweed option in the Coarse Screening Assessment.	Richard Murray

Community Consultation

Process and starting point

Time has been squandered and the whole process has been made complex by the number of games we have played with no feed back at the following meeting.	Tony Thompson
I do not wish to participate in a process which I consider to be inappropriate to our CWG study of four bulk water supply options.	Richard Murray

Effectiveness and appropriateness

Intentions of CWG are good but the process of each member getting past parochial viewpoints to think about the big picture is surprisingly difficult.	Pryce Allsop
The CWG is over-estimating its brief. We are providing recommendations for consideration by the Council who makes the decisions.	Pryce Allsop
The process has not been effective in negotiating a resolution. This is because of the hasty schedule which is insensitive to peoples concerns and leaves important issues unresolved and overlooks other data.	Sam Dawson

Broader Community Input

Council's information sessions at Tweed and Murwillumbah reached few people. At the Tweed Information meeting I recognised residents that I had contacted.	Richard Murray
Disappointing that the process did not focus on and engage with the broader community.	Don Beck
The community needed to be brought into the process sooner	Sam Dawson

Appropriateness of Information supplied

Process and information supplied is as good as can be expected.	Pryce Allsop
In my 1 hour talk with Anthony Burnham (TSC) & also with Chris Hennessy	Joanna

(Office of Water) at the Murwillumbah info session I learnt far more Gardner

Suggestions for future community consultation

The CWG should have been allowed to consider at least one other option of their own choosing. The group would then at least feel engaged.	Tony Thompson
The community needed to be brought into the process sooner.	Sam Dawson
It is worth seeking advice from the community, but not at this late stage when it is apparent that such advice is rarely considered.	Sam Dawson

Future work / Change of focus

Alternative water sources

We need to reuse the water already captured within our industrial system before siphoning more from the environment	Sam Dawson
Council refuses to use at least 30% of available reuse water now wasted, which saving would obviate the need for a Dam solution.	Richard Murray
There is community concern Council's Number one option 'Raising the existing Clarrie Hall dam' is a costly and needless project when more than 17000 ML of already available water will be wasted in 2036.	Richard Murray

Qualifications

Planning for Water Supply

Modelling of peak / max floods and the affect on dam buffer size needs to be confirmed through reassessment	Colleen Edwards
The raising of the Weir needs to be brought forward.	Robyn Lemaire

Management Plans

Geological surveys are important, as the raising could threaten the existing dam (blasting).	Robyn Lemaire
More water at Clarrie Hall Dam means more water quality controls. The mixers are up for upgrading, and multiplying, this will have to be further extended into the new areas also.	Robyn Lemaire
We need clean water in our homes, and in the rivers. This is the priority.	Robyn Lemaire

<u>Environment</u>

There is currently more money being spent on park maintenance than river health maintenance	Sam Dawson
Considerable expenditure is required to reverse Tweed's wastefulness and carelessness of the Tweed River environment.	Richard Murray

The Dam costs are undervalued. The costs need to increase to consider	Sam
environmental costs as well as engineering contingencies.	Dawson

Population Policy / Town Planning

The CWG would like to see Tweed SC consider population growth management options, informed by community feedback in this process.	Rachel Eberhard
In January 2010 Price Waterhouse concluded that 36 million was not sustainable economically. Whilst here on the Tweed our councillors are saying the you cannot stop people moving - have they never heard of a supply and demand curve?	Tony Thompson
There are simply not enough resources, water is a limiting factor	Sam Dawson
Population and water need to be linked as a policy statement "So much water can support so many people" We need to acknowledge limits to growth	Sam Dawson
Some of these development are going to be the slums of the future just look at experience of Roslyn Park near Wimbledon and many more examples in USA. Many scientists have looked at the problem of over crowding. This is what I mean by a comprehensive plan. I cannot answer the water questions in isolation.	Tony Thompson
All the new water supplies are needed for the new developments where there is going to be flooding in the foreseeable future.	Tony Thompson

Additional Comments

I think the appendices should be available but separate from this report. I think the wordsmithing of the report is important and people will want to review this. I think we need to be clear about making the report useful for our 2 audiences (the council, and the community).	Rachel Eberhard
Lack of Sustainable initiatives	
Ecological Sustainable Development (ESD) is a planning guideline that is intended to incorporate the concerns and needs of environmental constraints into government planning and decision-making, it has been mandated by government but rarely utilised. The Tweed Water Augmentation program similarly does not adequately consider ESD.	Sam Dawson
There are many principles that underlie ESD. Two of those relevant here are Intergenerational equity and Conservation of Biological Integrity. Intergenerational Equity states that the needs of the present generation should not deprive future generations of the ability to meet their needs. Dams are the ultimate symbol of generational inequity. For example, consider the planning process for Byrrill Creek; the land for the dam was set aside 20 + years ago with the intention of constructing a dam to meet the needs of the future residents of the shire, however, this planning denies current (and future) residents the ability to comment on that decision. When the decision to set aside the land for Byrrill Creek dam was made, I was only a child and I had no say in the decision. When governments make decisions	

like this they deny opportunities and degrade the environment for future generations. The argument about satiating the needs of future residents is myopic, especially when those needs are hypothetical and modelled on the unsustainable practices (of waste and consumption) that defined the 20 th century.	
Conservation of Biological Integrity is about preserving natural areas of High Conservation Value for their intrinsic worth. Byrrill Creek is one such area, and the Tweed contains many areas that are biologically significant. The 19 th and 20 th centuries were an era of massive destruction of biological diversity. The fragments that are left today we have a duty to preserve for ourselves and for the future.	
The concepts proposed hark back to first half of the twentieth century and draw inspiration from madmen such as Bradley and monstrosities such as the Snowy River Scheme. It has been made apparent that Interbasin Water Transfers are not a solution to water issues. They merely subsidise wasteful practices and stifle development of new initiatives. Furthermore, the 21 st century presents challenges to Western Society and Economic models that are based on centralised bureaucracies and power; resource shortages and commensurate market failures are the future of centralised systems which are based on the irrational assumptions of free market economics.	
In order to prepare for the future regions such as ours need to be moving towards greater independence and self-sufficiency utilising the best technologies that are on offer. Instead we have a trend towards 19 th century solutions to our 21 st century problems. Dams and pipelines will only subsidise a wasteful lifestyle.	
The listed attribute items in the matrices do not represent key Environmental impact and Social Impact attributes/concerns for the three Dams options. Some items are definitely not key issues, while others are questionable.	Richard Murray
While considering the four bulk water supply options CWG members have been successful in amending the Terms of Reference. (December 2009)	Richard Murray
The CWG meeting of 1 February CWG members voted in favour to support an amendment similar to a previous motion on the 18 January 2010 "That the Community Working Group has the ability to attach caveats to the recommendations made to Council that include advice regarding Demand Management"	
Council needs a much improved Demand Management Strategy than the limited Draft Strategy now on public exhibition. An improved strategy needs to include community expectations on water savings; improve 'poor' water quality and secure constant environmental Tweed River flows.	
Otherwise Council's philosophy for more Dams will continue.	
I he following water savings are available:	

Currently 92 % of reclaimed water now discharged into the Lower Tweed Estuary is wasted. By 2036 157,048 Tweed persons would generate approximately 14,330 million litres reclaimed water annually. Council is yet to complete the retrofit of remaining houses (approx, 50%) in Tweed and carry out an audit of other high use water items (dual flushed toilets, washing machines, hoses without trigger control). A retrofit of existing homes could result in a further saving of 600ML annually In the Community Working Group meeting of 18 February 2010, • project leader Tim Mackney advised in the Draft Minutes: "Council has discounted grey water - may look at again down the track" By 2036 157,048 Tweed persons each using a predicted 205 litres (392.6 kilolitres) per person per day would use 1175ML annually. In 2036 greywater availability would equate to 963.5ML annually. Loss of drinking water through water leakage, theft etc: The loss of • Non-Revenue Water in 2006 was 1274 ML per annum. In 2036 the drinking water loss is forecast at 2735 Million Litres annually. 5000 litre rain tanks would save around 80,000 litres annually. If 10,000 homes installed rainwater tanks, a further 1600ML could reduce Tweed's dependence on potable water. Council should make mandatory the installation of rainwater tanks in the 16000 dwellings now planned in Major Development areas. Rainwater tanks were installed in 236 000 homes in SEQ as part of the Queensland Government's WaterWise Rebate Scheme while tweed installed 117 tanks. The SEQ tank fit-out represents a penetration rate of almost one in four detached and semi-detached dwellings. Harvesting of bulk stormwater at the local level has not been • calculated in the above potential savings totalling 21228ML annually. This amount is almost equal to the secure yield (22,000ML per annum) from both the Tweed River and the raised Clarrie Hall Dam A projected population of 157,000 is expected to use 17000ML annually. • When only an additional amount of 3250ML per annum is required beyond 2017 to service a population of 157000 until 2036, it would seem to be irresponsible not to save available water for reuse. Independent expert review required Because water supply and demand issues are so complex, an independent expert should review Council's Dam option selection process and its Demand Water Strategy once it is approved, otherwise a needless Dam option could proceed

Re request for an Independent Expert Review

WaterTweed replied on 3 February 2010:

"All work to date has been carried out by independent experts. The reports supplied to you thus far show the breadth and depth of that independent expertise and have included information from all of the following experts: Montgomery Watson Harza (MWH), NSW Public Works" supported by nine other consultancy organisations and advice from Government agencies." "If part of the CWG's recommendations is that additional independent review be sought at an earlier stage, the CWG can suggest this in its report however an independent review will not be carried out for the CWG."

Comment

Tweed Shire Council has selected MWH, an international water consultancy some eighteen months ago to manage the screening of Tweed water supply options; prepare Tweed Shire Council's 'Drought Management Strategy' (2009); prepare the Demand Management Strategy and other related matters. MWH will even finalise the MCA Report containing our recommendation and all public submissions before finally going to Tweed Shire Council.

It seems not only to me that the Water Supply options process and the drafting of the Amended Demand Management Strategy now on public exhibition was very much an 'in house' WaterTweed Project.

Council had previously screened water supply options in their Integrated Water Cycle Management (IWCM) Context Study and Strategy (1st March 2006) and MWH would have been instructed MWH accordingly.

The 2006 IWCM favoured 'Raising Clarrie Hall Dam Wall option is a bulk water supply option.

MWH could hardly be described as being an independent expert when it was contracted by Tweed Shire Council to prepare the Tweed District Water Supply Augmentation Option list; The 'Drought Management Strategy'(2009); The Demand Management Strategy documentation and other related matters and assist in finalising the consultation process.

Conclusion

Montgomery Watson Harza (MWH) is a world wide water expert consultancy company used to having their commissioned water supply projects being checked by independent review.

Sometimes an independent review may be contrary to their expert advice and the project does not proceed. Council should be confident that their current Demand Management Strategy (DMS) is 'best practice' and should be satisfied to have their Dam option screening process and Management Demand Strategy reviewed by an independent expert?

An expert review of the bulk water supply options and DMS process should be sought once that Council has finalised the Demand Management Strategy now on public exhibition

Other Government approval Agencies will welcome the independent review when they are required to consider the closely connected Water Supply and Demand Management issues.

If Council is serious about an Independent Review then a reputable institution like the Institute for Sustainable Futures, University of Technology Sydney should be requested as soon as possible to carry out this expert review rather than another 'expert' water consultancy. Any delay in seeking a review is likely to have adverse and costly consequences for our future water supply.

Appendices

Appendix A – The CWG

A1: CWG Terms of Reference A2: CWG Membership list A3: Selection criteria and process
Tweed Shire Water Supply Augmentation Community Working Group

Terms of Reference

1. Background

The Tweed Shire Water Supply Augmentation Community Working Group (Community Working Group, or CWG) was established by Tweed Shire Council. It consists of members of the Tweed Shire community and aims to be representative cross-section of the Tweed Shire community.

The CWG's aim is to assist Council to select a preferred option from four shortlisted water supply augmentation options. The role of the group will be to investigate the options in some detail, collect and disseminate information with stakeholders and the wider community, and to work with Council to identify the key environmental, social and cultural issues associated with each option.

2. Purpose

The overall purpose of the CWG

The CWG supports Tweed Shire Council during this phase of the water supply augmentation process to find the best solution(s) to the following challenge:

Which option or combination of options will enable Council to provide a secure water supply to the community while:

- Respecting the local and regional environment
- Minimising adverse impacts of construction and operation on people, homes, and businesses
- Supporting the economic, social and cultural life of the area
- Maintaining a safe, reliable and cost effective water supply that meets the Shire's needs to the year 2036

The CWG will address this challenge by meeting the following objectives

1

Objectives of the CWG

To be a forum:

- to establish and build positive relationships between the Council, key stakeholders and the broader community
- to support two-way communication with key stakeholders and the broader community
- to provide information to stakeholders and the broader community about the options, assessment processes and issues used to determine a preferred option
- for stakeholders and the broader community to provide feedback on the options, assessment processes and issues used to determine a preferred option
- in which members can work together to identify environmental and community impacts of the options and to provide feedback on their prevention, minimisation and mitigation
- in which members can work together to identify opportunities for Council to communicate and consult with the broader community, and to provide feedback on the Council's consultation and communication plans and activities
- which drafts a report representing the views, interests and issues of members together with a summary of group recommendations for consideration by Council

3. Membership

Criteria for members of the CWG

Members will:

- Represent an identified relevant stakeholder group. Ideally members will be formally acknowledged as a representative of that group.
- Be available to attend meetings typically held on a weekday evening. The proposed draft meeting schedule is outlined in Section 5 below.
- Have ready access to a substantial network of community members and commit to communicating on a regular basis with that network.
- Have a demonstrable interest in one or more issues relevant to the options for water supply augmentation. Areas of interest include (but are not limited to)

the environment, the local economy, social and community impacts, engineering, water-related issues.

- Be willing and able to actively participate in the business of the CWG.
- Be willing and able to commit to the role and responsibilities of CWG
 members
- Commit to working to the Terms of reference for the CWG.

Membership of the CWG

The CWG is a forum of members representing key stakeholder groups and the broader local community, with membership consisting of representatives from the Tweed Shire local government area. Stakeholder groups to be represented include:

- Residents of Tweed Shire's three geographical residential regions, namely: Tweed Heads, Murwillumbah and rural communities, and the Tweed coast
- Landholders who's land would be directly physically affected by one of the options
- Representation from the Aboriginal Community
- Business and Commercial community within Tweed Shire
- Relevant environmental organisations and interests
- Local government Councillors
- Fisher, water user, or catchment user groups relevant to the options

The CWG will include two representatives of Tweed Shire Council, three community representatives, two affected landholders, two business or commercial interests, two environmental representatives, one water user representative and at least one Aboriginal representative. The CWG will also include an independent Chairperson.

Apologies are to be submitted to either the Chairperson or the Secretariat prior to the meeting. Alternates may be nominated to the Chairperson for approval prior to the meeting.

Term of Membership

The term of membership to the CWG will be for the period up to Council's decision which determines the next phase of the augmentation process. This is expected to occur at the April 2010 Council Meeting.

Remuneration and costs

Tweed Shire Council will not renumerate any members of the CWG for their participation, nor will any expenses incurred by members through participation in the CWG be payable by Tweed Shire Council.

4. Roles and Responsibilities

Decision Making

The CWG is consultative in nature. It is not a decision making body. Decision making powers are retained by Tweed Shire Council.

CWG members representing stakeholders and the broader community will:

- Openly discuss their interests who they represent, what they desire from the process, what is a good or bad outcome for them
- Have their contact details made public and be contactable by members of the public by phone, fax and/or email
- Regularly and proactively communicate with those they represent, and the broader community where possible, highlighting issues that affect that group
- Report to the CWG at each meeting on communication with those they represent, and input received
- Respect confidentiality of company, community and residents' communications and documents where required or requested
- Honestly share their opinions and listen respectfully to the opinions of others
- Commit to working constructively and cooperatively as a part of the working group
- Accept the workload of members, including:
 - Attending each meeting
 - Occasional local site tours
 - Reviewing minutes of meeting
 - o Communicating with stakeholders and the broader community
 - Verbally reporting to the CWG on communication activities
 - Reviewing and commenting on correspondence
 - Reviewing and commenting on Council reports and plans
 - Providing information to Council staff on relevant issues
 - Providing feedback on the options, assessment processes and issues used to determine a preferred option

The Independent Chairperson will:

- Help focus activities and discussion to meet the overall purpose and objectives of the CWG
- Help to establish and support the group agreement
- Work with members to ensure meetings are productive and efficient
- Work with the CWG to ensure all perspectives are heard and acknowledged
- Provide a point of contact for all stakeholders
- Be open, transparent and independent as a facilitator and convenor.

Tweed Shire Council will provide project staff who will:

- Honestly share their opinions and listen respectfully to the opinions of others
- Provide relevant, current and accurate information to the CWG, within agreed timeframes, and help people understand that information
- Be open and transparent with information and decision-making
- Follow-up relevant action items in an appropriate timeframe
- Provide feedback to the CWG on how community input has been actioned, or how it did or did not influence decisions made
- Support CWG members to communicate with the broader community
- Provide information direct to the broader community
- Provide a secretariat and logistical support for the CWG

Communications

CWG members are encouraged to discuss issues and disseminate information about water and the water supply augmentation options with stakeholders and the wider community.

Only the Independent Chairperson may publicly represent the CWG's position on behalf of the CWG, and these statements will first be agreed by the whole group.

Requests to keep information confidential to the CWG will be considered by the whole CWG. Where consensus cannot be reached on whether or not to keep information confidential, the decision of the Chairperson will be binding.

5. Operations

Meeting Protocols

Meetings will be held at Tweed Shire Council offices unless otherwise advised. An extraordinary meeting may be convened to discuss any matter warranting urgent consideration. Requests are to be made to the Chairperson, who will determine whether an extraordinary meeting is warranted.

Whilst the CWG will not be making decisions about the preferred option, it may make decisions on matters relating to the operation of the CWG. Such decisions will be made by consensus. Where consensus is not possible it will be by a two thirds majority. The independent Chairman does not have a vote.

Meeting Timing

Up to six meetings (and no less than four) are proposed to be convened – typically held on a weekday evening. The first meeting is proposed for early Dec 2009, and then up to five subsequent meetings at two week intervals from mid January 2010.

Meeting Agendas and Minutes

A call for agenda items will be distributed to members of the CWG at least 10 days prior to the next scheduled meeting. A final agenda will be circulated at least 5 days prior to the meeting.

A Council staff member will draft and prepare minutes within 48 hours of the meeting and circulate them to CWG members within 5 days of the meeting. Minutes will be endorsed by the Independent Chairperson prior to distribution to CWG and Project Team members.

Members are requested to return any proposed changes within five days to Tim Mackney at <u>waterTSC@tweed.nsw.gov.au</u> or Fax (02) 6670 2557.

The minutes will be treated as draft until they are adopted at the next meeting of the Community Working Group as which time changes will be considered and the minutes will be accepted as final. The draft minutes will also be distributed to registered Interested Parties as well as being displayed on Council's website. Final minutes are to be redistributed to the CWG, registered Interested Parties and the public.

Amendments

- Amended That the Community Working Group has the ability to attach caveats to 01.02.2010 the recommendations made to Council that include advice regarding
 - Demand Management.

TWEED DISTRICT WATER SUPPLY AUGMENTATION COMMUNITY WORKING GROUP PUBLIC CONTACT DETAILS

Name	Position
Tony Thompson	Community: Murwillumbah
Rob Learmonth	Community: Tweed Coast
Rachel Eberhard	Community: Tweed
Samuel Dawson	Environment
Richard Murray	Environment
Don Beck	Business/Commercial
Pryce Allsop	Business/Commercial
Robyn Lemaire	Water User
Colleen Edwards	Landholder: Clarrie Hall Dam Area
Joanna Gardner	Landholder: Byrrill Creek Dam Area
Jackie McDonald	Aboriginal Advisory Committee (provisional attendance)
Kyle Slabb	Aboriginal Advisory Committee (provisional attendance)
Cr Phil Youngblutt	Tweed Shire Council
Cr Dot Holdom	Tweed Shire Council

Tweed Shire Water Supply Augmentation Community Working Group

Criteria for Membership

1. Background

The Tweed Shire Water Supply Augmentation Community Working Group (Community Working Group, or CWG) is to consist of members of the Tweed Shire community and be a representative cross-section of the Tweed Shire community.

The CWG's aim is to assist Council to select a preferred option from four shortlisted water supply augmentation options. The role of the group will be to investigate the options in some detail, collect and disseminate information with stakeholders and the wider community, and to work with Council to identify the key environmental, social and cultural issues associated with each option.

The CWG is consultative in nature. It is not a decision making body. Decision making powers are retained by Tweed Shire Council.

2. Working Group make-up

It is important that the membership of the CWG represents the range of key interests, positions and concerns associated with the selection of a preferred augmentation option.

Stakeholder groups to be represented include:

- Residents of Tweed Shire's three geographical residential regions, namely: Tweed Heads, Murwillumbah and rural communities, and the Tweed coast
- Landholders whose land would be directly physically affected by one of the options
- Representation from the Aboriginal Community
- Business and Commercial community within Tweed Shire
- Relevant environmental organisations and interests
- Local government Councillors

• Fisher, water user, or catchment user groups relevant to the options

The CWG will include two representatives of Tweed Shire Council, three community representatives, two affected landholders, two business or commercial interests, two environmental representatives, one water user representative and at least one Aboriginal representative. All members will be selected against criteria.

The CWG will also include an independent Chairperson.

3. Method of Member Selection

Stakeholder group	Nomination method	Independent Selection Panel
Community	Call for EOIs	SCU
Environment	Call for EOIs	SCU
Business/Commercial	Call for EOIs	SCU
Water users	Call for EOIs	SCU
Affected Landholders	Direct nomination during individual meetings with affected landholders	Affected landholder group*
Aboriginal	Direct nomination by Aboriginal Advisory Committee	Aboriginal Advisory Committee*
Tweed Shire Council	Direct nomination	Tweed Shire Councillors*

Each member will be selected against the criteria described in Section 4 as follows:

EOIs – Expressions of Interest

SCU – Southern Cross University, Office of Regional Engagement

* additional criteria specific to these stakeholder groups may be imposed by the independent selection panels over and above those described in Section 4.

4. Draft Criteria

Criteria for selection on the CWG include:

	Criteria for Selection	Questions on nomination form to provide data for assessment
1.	Representing the Stakeholders : Members should ideally represent key stakeholder groups, and be acknowledged by stakeholders as representative. They may have a formal role in a stakeholder organisation, or be a recognised leader or spokesperson. Where there is no formal organisation (for example, if a group of landowners are being represented) members must be able to articulate the concerns and aspirations of those landowners.	 Which organisation do you represent? What position do you hold in that organisation? If not part of a formal organisation, which group of affected and/or interested stakeholders do you represent? What evidence can you provide that those stakeholders feel you represent then?
2.	Geographic Representation : Members should be connected to their local area or region so that they can represent the concerns and aspirations of that geographical area or region. The CWG should represent the full physical extent and diversity of the Tweed Shire.	 Which area of the Shire do you feel you best represent? Tweed Heads area Murwillumbah and rural environs Tweed Coast area Other
3.	Capacity to Communicate : Members must be able to communicate information from the working group out to their stakeholders, as well as to bring information from them in to the working group. Members must be a part of a network to be used for communication purposes. For example, they may be an active member of a relevant organisation. They may have access to local communication networks and processes (email lists, newsletters, meetings, events, other gatherings). Larger and regular distribution networks will be looked upon more favourably, as will use of methods that allow prompt and direct dissemination of information and feedback.	 Do you commit to regular communication with your stakeholders? Y/N Which method(s) will you use to disseminate information to stakeholders? Email list Meetings Newsletters or notices Other (specify) Which method(s) will you use to gather information from stakeholders? Email list Meetings Other (specify) Other (specify)
4.	Constructive Participation : Members must be able and willing to commit to working constructively and cooperatively as a part of the working group, and to fulfilling their role as laid out in the Working Group Charter.	Sign here if you have read the CWG Terms of Reference Charter and can commit to the conditions and expectations detailed
5.	Interest : Members should be able to demonstrable interest in one or more issues relevant to the options for water supply augmentation.	 Are you interested in one or more of the following issues relevant to the water supply augmentation options: environment local economy social and community impacts water-related issues other

	Criteria for Selection	Questions on nomination form to provide data for assessment
6.	Capacity to Contribute: Members must be able and willing to commit to the role and responsibilities of the CWG and actively participate in the business of the CWG	 Are you prepared to commit to the workload required of members, including: Attending each meeting Occasional local site tours Reviewing minutes of meeting Communicating with stakeholders and the broader community Verbally reporting to the CWG on communication activities Reviewing and commenting on correspondence Reviewing and commenting on Council reports and plans Providing information to Council staff on relevant issues Providing input on the selection of the preferred option
7.	Availability : Members must be available and willing to meet regularly though the December, January, February, March period (19 Dec – 10 Jan excluded)	Up to six meetings (and no less than four) are proposed to be convened – typically held on a weekday evening. The first meeting is proposed for early Dec 2009, and then up to five subsequent meetings at two week intervals from mid January 2010. The draft meeting schedule is as follows: Early December – 1 meeting Mid/late January – 2 Meetings February – 1 or more Meetings March – as and if required Are you able to commit to all of these meetings? Y/N

Tweed District Water Supply Augmentation Community Working Group

Nomination Form

Please complete answers in the table fields provided. You may also provide additional pages or attachments if required. Electronic version is available at <u>http://www.tweed.nsw.gov.au/Water/WaterSupply.aspx</u>

Nominations close Tuesday 17th November 2009

HOW TO SUBMIT YOUR NOMINATION WHEN USING THIS PDF FORM

Hard copy nominations to be posted to Ms Lisa Francisco, Tweed CWG Independent Selection Panel Coordinator, Office of Regional Engagement, Southern Cross University, PO Box 42, Tweed Heads, NSW 2485. If submitting by hardcopy, please limit the number of pages to a total of six.

If you wish to scan this hardcopy form and any attachments into an email, email directly to **lisa.francisco@scu.edu.au** (Tweed CWG Independent Selection Panel Coordinator at Southern Cross University's Office of Regional Engagement, Tweed/Gold Coast Campus).

The Selection Panel from Southern Cross University will determine CWG membership independently. To maintain transparency in the process Tweed Shire Council requests that you DO NOT SEND YOUR NOMINATION FORM TO COUNCIL.

Nominee Details

Your Name:

Postal Address:

Email:

Phone: ()

Mobile:

Fax: ()

Other:

All members of the Community Working Group (CWG) must be willing to be a point of contact for the community. Please nominate at least one contact detail for distribution to the community (mark relevant check box above). Only nominated contact method(s) will be made public and only those of successful candidates. No contact details from unsuccessful candidates will be disclosed.

1. Representing the Stakeholders

Members of the Community Working Group (CWG) should ideally represent key stakeholder groups, and be acknowledged by stakeholders as a representative. They may have a formal role in a stakeholder organisation, or be a recognised leader or spokesperson. Where there is no formal organisation, members must be able to articulate the concerns and aspirations of those they are representing.

1 a) Which position on Community	the CWG do you wish to nominate for? [You may nominate only one] Tweed Murwillumbah			
Environment				
Business/Commercial				
Water users				
Affected Landholders	Direct nomination by affected landholders			
Aboriginal	Direct nomination by Aboriginal Advisory Committee			
Tweed Shire Council	Direct nomination by Tweed Shire Councillors			
1 b) Which organisatic	on do you represent?			
1 c) What position do	you hold in that organisation?			
1 d) If not part of a formal organisation, which group of affected and/or interested stakeholders do you represent?				
1 e) What evidence can you provide that those stakeholders feel you represent them?				
1 f) Do you accept tha CWG issues with	at your contact details will be made available for the public to discuss you?] No			

2. Geographic Representation
Members should be connected to their local area or region so that they can represent the concerns and aspirations of that geographical area or region. Membership to the CWG will be determined such that the CWG represents the full physical extent and diversity of the Tweed Shire.
Which area of the Shire do you feel you best represent?
Tweed Heads Area Murwillumbah and Rural Environs
Tweed Coast Area Other:
3. Capacity to Communicate
Members must be able to communicate information from the working group out to their stakeholders, as well as to bring information from them into the working group. Members must be a part of a network to be used for communication purposes. For example, they may be an active member of a relevant organisation. They may have access to local communication networks and processes (email lists, newsletters, meetings, events, other gatherings).
Larger and regular distribution networks will be looked upon more favourably, as will use of methods that allow prompt and direct dissemination of information and feedback.
3 a) Do you commit to regular communication with your stakeholders?
3 b) Which method(s) will you use to disseminate information to stakeholders? Email list Meetings Newsletters or notices Other (specify) How often?
3 c) Which method(s) will you use to gather information from stakeholders? Email list Meetings Other (specify) How often?

4. Constructive Participation		
Members must be able and willing to commit to working constructively and cooperatively as a part of the working group, and to fulfilling their role as laid out in the Community Working Group Terms of Reference.		
Have you read the CWG Terms of Reference and can you confirm your commitment to the conditions and expectations detailed therein?		
Yes No		
5. Interest		
Members should be able to demonstrate interest in one or more issues relevant to the options for water supply augmentation.		
Are you interested in one or more of the following issues relevant to the water supply augmentation options:-		
Environment Water-related issues		
Local Economy Social and Community Impacts		
Other (specify)		
6. Capacity to Contribute		
Members must be able and willing to commit to the role and responsibilities of the CWG and actively participate in the business of the CWG.		
Are you prepared to commit to the workload required of members, including:-		
Attending each meeting		
Occasional local site tours		
Reviewing minutes of meeting		
Communicating with stakeholders and the broader community		
Verbally reporting to the CWG on communication activities		
Reviewing and commenting on correspondence		
Reviewing and commenting on Council reports and plans		
Providing information to Council staff on relevant issues		
Draviding input on the calection of the proferred option		

7. Availability

Members	must be	available	and	willing to	meet	regularly	though	the	December,	January,
February,	March pe	eriod (19 E)ec –	10 Jan e	xclude	ed)	-			-

Up to six meetings (and no less than four) are proposed to be convened – typically held on a weekday evening. The first meeting is proposed for early Dec 2009, and then up to five subsequent meetings at two week intervals from mid January 2010.

The draft meeting schedule is as follows:-

Early December – 1 meeting Mid/late January – 2 Meetings February – 1 or more Meetings March – as and if required
Are you able to commit to all of these meetings? Yes No
If no, which meetings are likely to pose a problem?
Additional Information:

Additional Information (continued)			
	_		

Tweed Shire Council October 2009



Re: Tweed Shire Council's Community Reference Group

Southern Cross University (SCU) is pleased to provide an impartial selection panel for the Tweed Shire Council (TSC) for the purposes of identifying appropriately placed community representatives to sit on the Council's Community Reference Group focussing on Water Needs and Issues for the region.

The panel will refer to the Selection Criteria developed by Council to recommend members to the Community Reference Group from Expressions of Interest received from residents.

SCU has proposed a selection panel of up to six independent members. The proposed members have relevant expertise to enable the panel to select Community Reference Group members based on an assessment of nominations received. The panel will comprise of a minimum of four members. The exact membership of the panel will be dependent on the timing of Council's overall community consultation program and the availability of individual members during the appropriate periods. It is SCU's understanding that it is Council's intent to have the membership of the Community Reference Group confirmed by the end of November 2009.

SCU Independent Panel nominated members;

Jan Strom (Chair of Panel)

Jan works for the Office of Regional Engagement. She is an active player in the development of policy and planning for engagement within the University. She has a Master of Professional Management. Her PhD examined regional University-Community Engagement. Jan regularly presents at conferences. She has produced a number of reports and papers on topics such as Creative Industries, the Scholarship of Engagement, Organisational Change, and Cultural Trails. Jan is an experienced facilitator having conducted numerous sessions at local government, community, business, and public sector conferences, workshops and seminars.

She is an active contributor to regional development of the Mid North Coast region and is a member of the Mid North Coast Regional Development Australia (and the MNC Regional Development Board since 2002). Jan was on Coffs Harbour City Council from 1999-2004, and Deputy Mayor (2000-04). During that time she had extensive involvement in civic, cultural, economic and community development activities.

Lisa Francisco

Lisa Francisco is the Engagement Facilitator for the Office of Regional Engagement at the Tweed Heads Gold Coast Campus of Southern Cross University. She has a Bachelor of Behavioural Science majoring in Training, Development and Change Facilitation, Work and Health and holds a Certificate in Careers Education and Development. Lisa has worked in the field of youth development and community engagement for the past 10 years. Her experience has included providing outreach support to regional Queensland, working in both government and community sectors. Lisa continues to work closely with the youth and community sector and has been a member of Management Committee for Care For Life Suicide Prevention Assoc. for the past 4 years. Her experience includes youth advocacy, community and youth consultation and project management.



Kirsty Howton

Kirsty Howton is Southern Cross University's Environmental Sustainability Officer. She holds a Bachelor of Applied Science (Coastal Management) and has worked with the North Coast Institute of TAFE, based in Port Macquarie project managing "Ecological Sustainability Initiatives". Kirsty's experience covers areas such as strategic planning, policy development, staff engagement and the project management of sustainability initiatives.

Heather Hancock

Heather has a diverse background in midwifery, private practice and practice change/development, midwifery education and research with experience in rural, remote and urban settings in Australia and overseas. Most recently Heather was responsible for the development of the Northern Territory Government Home Birth Service as well as planning a new model of practice for NT Child and Family Health and in 2009, for the development of Midwifery Group Practice at the Alice Springs Hospital. Heather has reviewed Aboriginal perinatal wellbeing and outcomes, and developed quality indicators for Aboriginal perinatal primary health and health care. Additional research interests focus on woman centred care as a source of substantiation for effective practice, women's health and perinatal psychology, rigour in qualitative research and innovation and excellence in teaching and learning. In 2006 along with Lareen Newman, Heather published *Better Birth* and has an extended range of other publications.

Leigh Davison

Dr Leigh Davison is the Director for the Centre of Ecotechnology. The Centre for Ecotechnology (CET) conducts research into the sustainable use of wastewater and related environmental technologies. Its focus is on the design and construction of ecosystems for the mutual benefit of humans and nature. Leigh is a Senior Lecturer within the School of Environmental Science and Management at Southern Cross University. Leigh is an expert on water issues and has conducted numerous research and consultancies in the areas of sustainability sanitation, intergrated industrial water cycle management, investigations into the treatment and reuse of domestic greywater and risks associated with on-site wastewater management systems in local catchments. He has won over \$1mil worth of funding and grants for his work and is a member of the Australian Water Association (AWA), and Lismore City Council's Sustainable Environment Policy Advisory Group and On-Site Wastewater Management Working Group. Previously he was a member of Richmond Valleys Catchment Management Committee and the Far North Coast Water Management Committee.

Mike Singleton

Dr Michael Singleton is currently Director, Corporate Programs in the Graduate College of Management at Southern Cross University where he draws upon his extensive first hand experience working with Boards of Directors and CEOs in order to develop and improve corporate governance processes.

Throughout his career, Dr Singleton has maintained close contact with the academic world both through his own research, which has been presented at international conferences, and through teaching, mainly at a post graduate level. Most recently, he has taught in MBA, Master of International Business and Master of Quality Management programs. He is a regular participant in the programs of the European



Institute of Advanced Studies in Management headquartered in Brussels, most recently delivering academic papers in Paris and Edinburgh and attending its corporate governance conference in Venice. He has held roles of Chief Executive Officer with a leading Australian healthcare sector company and was Director of Administration at the University of Wollongong in Dubai in the United Arab Emirates where he was a member of its three person Executive with responsibility for ensuring good governance and oversight of the operations and strategic development of the administrative and marketing functions of the university.

SCU is pleased to offer support for the Tweed Shire Council's initiative as part of the ongoing relationship recognised in the SCU-TSC MoU.

Contact: Lisa Francisco Office of Regional Engagement Tweed Gold Coast Campus: Southern Cross University

P: 07 5506 9375
E: lisa.francisco@scu.edu.au
F: 07 5536 8736
W: http://engagement.scu.edu.au
PO BOX 42 Tweed Heads NSW 2485 Australia
Suite 11 Airport Central, Gold Coast Hwy, Bilinga Qld

Appendix B - Process followed

B1: Meeting minutes and site visit notes
B2: List of information shared
B2.1: Council to CWG
B2.2: CWG to Council
B3: List of additional work undertaken
B3.1: By CWG Members
B3.2: Due to requests by CWG members

B1: Meeting minutes and site visit notes



Minutes of the Water Supply Augmentation - Community Working Group Meeting held Tuesday 1 December 2009

Venue:

Canvas & Kettle Meeting Room

Time:

5.00pm - 9:00pm

Present:

Facilitator - Stuart Waters (Twyfords)

Rachel Eberhard (Tweed); Rob Learmonth (Tweed Coast); Tony Thompson (Murwillumbah); Samuel Dawson (Environment); Richard Murray (Environment); Don Beck (Business/Commercial); Pryce Allsop (Business/Commercial); Robyn Lemaire (Water User); Colleen Edwards (Landholder: Clarrie Hall Dam Area) Joanna Gardner (Landholder: Byrrill Creek Dam Area); Jackie MacDonald (Aboriginal Advisory Committee - provisional attendance); Cr Phil Youngblutt and Cr Dot Holdom (Tweed Shire Council); David Oxenham and Anthony Burnham (Tweed Shire Council Staff); Tim Mackney (Public Works NSW); Mark Hunting (MWH).

Guests:

Cr Warren Polglase (Mayor), Cr Barry Longland, Cr Kevin Skinner, Cr Katie Milne and Mike Rayner (General Manager Tweed Shire Council).

Apologies:

Cr Joan van Lieshout

Objectives:

To be a forum that will / where:

- establish and build positive relationships between the Council, key stakeholders and the broader community
- support two-way communication with key stakeholders and the broader community
- provide information to stakeholders and the broader community about the options, assessment processes and issues used to determine a preferred option
- provide feedback for stakeholders and the broader community on the options, assessment processes and issues used to determine a preferred option
- members can work together to identify environmental and community impacts of the options and to provide feedback on their prevention, minimisation and mitigation
- members can work together to identify opportunities for Council to communicate and consult with the broader community, and to provide feedback on the Council's consultation and communication plans and activities
- draft a report representing the views, interests and issues of members together with a summary of group recommendations for consideration by Council



Water Supply Augmentation Option Selection Working Group

Minutes of Previous Meeting:

This is the inaugural meeting of the Water Supply Augmentation Option Selection -Community Working Group to be held and there are no previous minutes for consideration.

Agenda Items:

1. Welcome & Introductions – meet the members

Councillors attended this part of the meeting to meet the members of the Working Group and to participate in initial discussions relating to the process and role of this Group.

Cr Polglase expressed his thanks for the initiative and commitment shown by the representatives participating in this process.

2. Meeting with Councillors – Clarifying role and process

Introduction and Overview

The group was given a brief overview of the objectives of this phase, the processes undertaken to date and the assessment process using Multi-Criteria Analysis (MCA).

The objective of this phase of the project is to provide Council (the decision making body) the certainty it requires to make a decision on a preferred option. A flowchart was presented highlighting the increasing investment of resources required as the project proceeds. It is therefore imperative that Council is able to make decisions that reduce the risks associated with moving forward to subsequent phases and increased resource requirements.

The MCA procedure was outlined and the following criteria were briefly described:

- 1. Secure Yield (mandatory)
- 2. Planning Objectives
- 3. Established Technology & Feasibility (mandatory)
- 4. Environmental Constraints
- 5. Social Acceptability
- 6. Legislative Acceptability
- 7. Cultural Heritage Impacts
- 8. Lead Time and Potential for Escalation
- 9. Annualised Cost per kL and NPV (30 years)
- 10. Greenhouse Gas Emissions

Any questions so far?

The group was invited to highlight questions and topics regarding the information presented on the criteria, options and process:



Water Supply Augmentation Option Selection Working Group

- What is testing the assumptions that the population will be 157,000 in 2036 which requires the review of water supply?
- What is the cost impact to the ratepayer for each of the options?
- What other way can be identified to resolve "Cultural Heritage Impacts"? Perhaps hold a meeting at the Minjungbal Aboriginal Centre? Liaison on cultural issues with the Aboriginal Advisory Committee throughout this process will be undertaken outside of this forum.
- What is the Environmental carrying capacity of the Shire?
- Further shortlisting will one option be discounted early in the process?
- Is climate change uncertainty included?
- Is there more information on Demand Management?

Process

What would a good outcome look like? What will give Councillors, members of the CWG, and the Project Team confidence that this process has worked out? A wide range of points were noted:

- Result should be unanimous
- The preferred option should look at the long term right first time.
- Explicit statement linking water to population acknowledge limited amount of water and population to be supported.
- Option with the least environmental impact the decision will affect generations to come.
- We are members of the CWG with individual viewpoints that will unite for one recommendation to benefit the whole of the Tweed.
- Successfully gathering information and community input to put forward a preferred option

Comments - What will give you confidence that this process has worked out? (Complete list of suggestions recorded in small group discussion)

- A clear & unanimous decision
- A good decision not-half-baked
- Monitoring through further development to check our assumptions and rationale, e.g. continue to consider new technologies and costings
- Confident that consultation is effective (outreach to community)
- Clarity on objectives i.e. serving Tweed or a wider water network managing state and national imperatives
- CWG Members have individual viewpoints but we must come up with Recommendations for the Tweed.
- Concentrate on options that are more likely to "get up"
- Option with least environmental impact.
- Like a consensus decision
- Outcome is sustainable and suitable
- Explicit statement linking water to populations
- Successfully gathered data and community input to put forward the preferred view.
- How are we going to manage water
- Allow more water for increased usage requirements in the future.





Water Supply Augmentation Option Selection Working Group

ADJOURNMENT OF MEETING

Adjournment for dinner at 6.35pm after which the members of the CWG and Project Team will reconvene.

RESUMPTION OF MEETING

The Meeting resumed at 7.30 pm

3. **Project Overview**

Tim Mackney gave a PowerPoint presentation in relation to Council's Integrated Water Cycle Management (IWCM) Strategy and a background to the Water Supply Augmentation project. (Copy of the presentation is attached to these minutes for the information of members.) The work carried out to date has been:

- Council has approached water supply under the IWCM Strategy (Strategy Action No 7) by addressing:
 - reducing water use (demand management)
 - access to adequate sources of water
- Why, despite all of the demand management actions are we augmenting? The projected population growth of the Shire will cause us to exceed the capacity of our current water supply system some time between 2017 and 2027.
- Objectives of the Water Supply Augmentation project are to ensure:
 - 1. Sufficient water quantity (30 years).
 - 2. Minimise impacts
- Council identified 9 Options which were subsequently assessed as part of a Coarse Screening Process. This process identified four Short-listed Options that are being looked at during this phase, from which one Preferred Option will be determined:
- •
- 1. Raising the existing Clarrie Hall Dam
- 2. New dam on Byrrill Creek
- 3. Pipeline link to South East Queensland at Tugun
- 4. Pipeline to link to Rous Water / smaller pipeline link to SEQ Water / groundwater supply

Q: Richard Murray foreshadowed the need to consider harvesting of stormwater in relation to the developments planned at Kings Forest Cobaki Lakes and The Rise.

A: Council is planning for the roof rainfall component of stormwater through mandatory installation of rainwater tanks. Specific stormwater harvesting can be touched on in a future meeting.



Water Supply Augmentation Option Selection Working Group

Q: Colleen Edwards requested details on Indirect Potable Reuse and queried why would good drinking water be pumped back to Clarrie Hall Dam?

A: Detailed information is contained in the Coarse Screening Options Report (copy supplied in the blue folders). Any further specific technical details can be discussed in the next meeting.

Q: Rob Learmonth suggested that the preferred option should also include recommendations for waste water management and demand management.

A: This component of the integrated Water Supply problem has been incorporated through Council's demand management and water recycling strategies, and is intrinsically part of the red and blue demand curves showing the need to augment the system. It was also mentioned that the options that were not short-listed may be revisited in the future as better technology becomes available and more cost effective, however many are currently cost prohibitive (up to 6 times the cost of cheaper options)

Where to from here?

- This phase requires additional information and studies, and input from stakeholders and the community to inform the MCA procedure. From the results of the MCA, a preferred option will be recommended to Council, and the Councillors will make a decision.
- The aim of community consultation is to *Inform, Consult* and *Involve* stakeholders and the community. The CWG will be an important tool to incorporate stakeholder input, particularly on environmental and social issues. Aboriginal cultural issues will not be dealt with in this forum.
- It will be important to link community with the information and the Working Group as part
 of the engagement process. This will be done a number of ways including distributing
 minutes on Council's website and to those on the Interested Parties Register. Articles
 and advertisements in local media will also be employed. The CWG can propose to
 disseminate other information in these ways also.

Q: Rachel Eberhard queried the mechanism for inclusion of the community working group's submission in the report that is to be submitted to Council.

A: Stuart Waters suggested that the CWG's most pertinent advice to Council would be on environmental and social criteria where there is limited scientific information available. Tim Mackney confirmed that this may also include recommendations on the ratings of these criteria and the weightings in the MCA. How the CWG's recommendations will be incorporated into the MCA together with technical data and submissions from other stakeholders still needs to be clarified. The CWG will continue to consider how this might be achieved.

Comment: Rob Learmonth would like to ensure that the CWG is able to contact and be contacted by stakeholders and the community. He requested feedback from concerned individuals as there was concern that ensuring the clarity of input from those groups will be difficult and ensuring efficient collection of information will be the most difficult step in this process.

Comment: It was requested that the CWG be kept up to date at all times of changes to information and relevant data.



Water Supply Augmentation Option Selection Working Group

Comment: Public Submissions will be accepted up until 26 March 2010 with a report and recommendations from the CWG to be provided two weeks prior to allow community to make informed submissions. The collation of this feedback is to be discussed at future meetings. It was suggested that the public comment period may need to be extended to four weeks.

Comment: Concern was expressed that the timeframe for this Working Group is extremely limited and that there is a need to be realistic in representative role of members, all their stakeholder groups and the time constraints involved in the process.

Comment: There was a general invitation to the Aboriginal Advisory Committee (AAC) to participate in the CWG and provide input on cultural heritage issues. Tim Mackney reiterated that Council had and would continue to consult with the Aboriginal Advisory Committee directly at their monthly meetings which was their preferred forum. At the same time, AAC representatives are welcome to attend the CWG meetings to see the discussion for themselves. The CWG extended that invitation to Jackie MacDonald who was attending on behalf of the AAC. It was again reiterated that Aboriginal cultural issues will not be dealt with by the CWG.

Comment: There will be a need to consolidate information received from stakeholders to ensure it can be readily reviewed and understood by the CWG.

Comment: Richard Murray suggested that there be consultation with stakeholders to incorporate their comments, seek submissions through the local press and keep the interest in this process - the group in action, result of the report preparation and receipt of submissions.

Comment: Don Beck suggested the CWG consider what the quality of life of those on the Tweed would be if no water supply augmentation was undertaken.

Comment: Tony Thompson felt that despite the information in the fact sheets, we are operating in the dark regarding hard facts and urgently need more information if we are to fit everything into the time frame. He sees a need to have more information to give to local people.

5. Review Terms of Reference

A copy of the amended Terms of Reference attached to these minutes.

There was a discussion regarding how meeting minutes will be drafted, accepted and distributed. The proposed method is included in the revised Terms of Reference:

- i) Council staff to draft the minutes within 48 hours,
- ii) Independent Facilitator to endorse for distribution,
- iii) draft minutes immediately distributed to all CWG members,

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Water Supply Augmentation Option Selection Working Group

- iv) members to return any proposed changes within five days to Tim Mackney at <u>waterTSC@tweed.nsw.gov.au</u> or Fax (02) 6670 2557,
- v) draft minutes distributed to Interested Parties Register and displayed on Council website,
- vi) changes will be considered at the following CWG meeting and minutes will be accepted as final,
- vii) final minutes will be redistributed to the CWG and public.

There was discussion about the timetabling of meetings for the process and it was determined to undertake a survey of members to ascertain the most suitable day and time as mutually convenient.

Action: That Tim Mackney generates an email request for suitable meeting days.

- Action: At the next meeting, alternative meeting venue sites relevant to members of the CWG be investigated.
- <u>Post Meeting Note</u>: Alternative meeting venue sites that could be easily accommodated if required include at Council's Offices in Tweed Heads and Council's Sustainable Living Centre at Kingscliff/Chinderah.
- Action: The amended Terms of Reference be forwarded to members for comments prior to adoption at the next meeting.

6. Review Working Principles for the Group

The CWG members were requested to think about what principles underpin the way they like to operate in their everyday life. –The following values were identified by the CWG.

Partnership	Listen	Honesty	Respect	Other
 Fully understand others views Treat people how you would to be treated Be a Team Work for the Tweed Purposively, ie constructively towards our objective 	 Listen and acknowledge Listen to all No bias up front speak plainly Open minded 	 Integrity Truth and honesty Openly 	 Transparency Analytically 	 Face your fears Disinterest Fully informed Balance / Broad consideration. If you are not part of the solution you are part of the problem.



Water Supply Augmentation Option Selection Working Group

Stuart Waters suggested that these operating principles would be useful to the CWG during the next months when interacting together.

Stuart Waters presented some PowerPoint slides to highlight the ways groups can interact. The first slide set the scene with a definition of engagement:

"Community Engagement is.....

any process that involves the public in problem solving or decision-making, and uses public input to make better decisions."

The next slides summarised;

- the difference between Debate and dialogue
- the ratio of inquiry to advocacy of high functioning groups (ratio of 2:1)

(Copy of the presentation is attached to these minutes for the information of members.)

8. Next steps

Requests of the Project Team for next meeting (earlier if possible)

- Request for updated information on both Clarrie Hall Dam and Byrrill Creek representatives to facilitate better discussions with constituents.
- Problems with viewing comparison tables larger copies to be provided with minutes.
- <u>Post Meeting Note</u>: After the meeting the attachments to the Course Screening Options Report provided in the blue folders were viewed. The attachments containing maps and tables have been supplied in A3 size and were agreed to be adequate.

Homework for next meeting

- To give some thought about the inclusion of information and/or presenters to address the CWG as part of the process. What/who might offer the most benefit to the group?
- CWG members to be ready to tell their own stories to assist in facilitating informed advice. Why is this issue and process so important to you that you are giving up your time to participate in the CWG?
- Reflect on Terms of Reference and Operating Principles. Terms of Reference to be adopted at next meeting.
- Have a think about what other information does the CWG need to know and what do the constituents need to know? Members requested to provide Tim with queries on the items of interest for consideration at next meeting. Hard data request - Tim & AB to make a presentation to next meeting to provide significant direction on queries raised.
- Feedback on homework. What else can be done / set next time?

Each member was provided with a copy of the Options Report and asked to review with the following questions in mind.

- 1. What do you need to better understand?
- 2. What do need to know in relation to the options?
- 3. What are the important questions you and your stakeholders have?
- 4. Who might help this Group receive good information?
- 5. When reviewing Options Report it is suggested that the following be considered:

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Water Supply Augmentation Option Selection Working Group

- Weightings
- Reflection on Data
- Criteria assessment social acceptability/environmental constraints

Other items

 Joanna Gardner advised of a meeting on 7 December 2009 commencing at 7.00pm at Uki - combination of Uki/Clarrie Hall/Byrill Creek residents to discuss water options seeking submissions. Open forum/debate with distribution of a feedback survey.



General Business:

9. Contact Details

Below is the contact list for the representatives of this Working Group. The details below are for public information:

Name	Position	Public Contact Details
Rachel Eberhard	Community: Tweed	Rachel@eberhardconsulting.com.au 0432 683 598
Rob Learmonth	Community: Tweed Coast	roblearmonth@westnet.com.au 0428 249 483



Water Supply Augmentation Option Selection Working Group

Name	Position	Public Contact Details
Tony Thompson	Community: Murwillumbah	tessandtony@yahoo.com.au 02 6679 1051 0432 342 159
Samuel Dawson	Environment	PO BOX 662 Murwillumbah 2484 <u>dawsonsk@bigpond.com</u> 02 6672 7765
Richard Murray	Environment	rwmy125@tpg.com.au 07 5599 1315
Don Beck	Business/Commercial	d.l.beck@bigpond.com 07 5524 8716 0428 660 476
Pryce Allsop	Business/Commercial	pryce@allhome.com.au 02 6672 5776 0400 122 016
Robyn Lemaire	Water User	red_robyn_65@yahoo.com.au 02 6672 1791
Colleen Edwards	Landholder: Clarrie Hall Dam Area	colleenedwards@websitefx.com.au 02 6679 9115
Joanna Gardner	Landholder: Byrrill Creek Dam Area	Peter.symons8@bigpond.com (02) 6679 7039
Jackie McDonald	Aboriginal Advisory Committee (provisional attendance)	ТВА
Kyle Slabb	Aboriginal Advisory Committee (provisional attendance)	ТВА
Cr Phil Youngblutt	Tweed Shire Council	Ph: (02) 6677 9323 Fax: (02) 6677 9323 0418 617 071 pyoungblutt@tweed.nsw.gov.au
Cr Dot Holdom	Tweed Shire Council	0437 037 069 dholdom@tweed.nsw.gov.au

Next Meeting:

The next meeting of the Water Supply Augmentation Option Selection - Community Working Group Committee will be advised following survey of members in relation to availability.

The meeting closed at 9.15pm.

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TWYFORDS Different ways to proceed

Debate

- Assume there is only one answer
- We find flaws and develop counter-arguments
 - We defend our
- assumptions and positions
 - We seek to be 'right' and prove others 'wrong'
 - We seek to win, while others lose.

Dialogue

- We assume others have relevant knowledge
- We seek to understand what others know, what they believe, and why they believe it
 - We seek a common understanding
- We question our own assumptions There may be more the
- There may be more than one right answer

Water Supply Augmentation Option Selection Working Group







Water Supply Augmentation Option Selection Working Group





Minutes of the Water Supply Augmentation – Community Working Group Meeting held Monday 18 January, 2010

Venue:

Canvas & Kettle Meeting Room

Time:

5:30pm - 9:00pm

Present:

Facilitators Stuart Waters (Twyfords) Tim Mackney (Public Works)

Rachel Eberhard (Tweed Heads); Rob Learmonth (Tweed Coast); Tony Thompson (Murwillumbah); Samuel Dawson (Environment); Richard Murray (Environment); Robyn Lemaire (Water User); Colleen Edwards (Landholder: Clarrie Hall Dam Area) Joanna Gardner (Landholder: Byrrill Creek Dam Area); Cr Phil Youngblutt and Cr Dot Holdom (Tweed Shire Council); Don Beck (Business/Commercial); 5.45pm arrival

David Oxenham, Anthony Burnham & Michael Wraight (Tweed Shire Council Staff); Mark Hunting (MWH). Geraldine O'Flynn (Southern Cross University)

Apologies:

Jackie MacDonald (Aboriginal Advisory Committee) Pryce Allsop (Business/Commercial);

Objectives:

To be a forum that will / where:

- establish and build positive relationships between the Council, key stakeholders and the broader community
- support two-way communication with key stakeholders and the broader community
- provide information to stakeholders and the broader community about the options, assessment processes and issues used to determine a preferred option
- provide feedback for stakeholders and the broader community on the options, assessment processes and issues used to determine a preferred option
- members can work together to identify environmental and community impacts of the options and to provide feedback on their prevention, minimisation and mitigation
- members can work together to identify opportunities for Council to communicate and consult with the broader community, and to provide feedback on the Council's consultation and communication plans and activities
- draft a report representing the views, interests and issues of members together with a summary of group recommendations for consideration by Council



Meeting commenced 5.35pm

1. Welcome

By Stuart Waters – the group briefly reintroduced themselves.

2. Introduction

Stuart introduced Geraldine O'Flynn from Southern Cross University. Geraldine advised the group she was from the Regional Futures Institute, part of Southern Cross University, and had requested to attend the Community Working Group and observe the process from a learning perspective. She explained her interest in looking at the outcomes and observing the process for future facilitation programmes. Colleen Edwards asked if she was participating in the process and Geraldine responded that attendance was just from an observation viewpoint. Geraldine left the room whilst the group discussed if there was any objection to her attendance. The group agreed by unanimous vote that there was no objection to Geraldine attending the Community Working Group meetings.

3. Minutes of Previous Meeting:

The group reviewed minutes and there was brief discussion relating to the words "environmental constraints" on page 8 of the draft minutes point 5 – Criteria Assessment. It was agreed that minutes be accepted.

Moved: Rachel Eberhard Seconded: Rob Learmonth

RESOLVED that the Minutes of the Water Supply Augmentation – Community Working Group meeting held Tuesday 1 December, 2009 be accepted as a true and accurate record of the proceedings of that meeting.

4. Business Arising from previous meeting:

Rachel requested group discussion regarding the roles of the CWG and the selection process and within what timeframe for the community to be engaged? Stuart commented that this will be addressed later in the meeting.

4a. Community Survey- Water options survey

Joanna presented the results from her Community survey (copy provided to the Group). She acknowledged assistance from J Morrison,& input from Sam Dawson, Rachel and Colleen & others from Byrrill Creek . The survey was first distributed at the Uki Meeting Joanna had organised on 7 December at which time 100 surveys were distributed. In total, 700 surveys were distributed through various means hand deliveries to Byrrill Creek & Clarrie Hall residents, Uki Post Office,& the Caldera Environment Centre. They were also emailed out via various email networks, including the CWG members twice, in both a long & short version, that could be returned by email. Joanna asked for a show of hands of which members returned them. One CWG member had returned a survey form. She noted that this was a reflection of the



general public's response, especially given the time frame right on Christmas/NewYear. In total 159 surveys were returned by the closing date of 10 January. Joanna expressed her disappointment that so few had been returned.and noted the small sample size. When questioned by members if it was too late, she said it may be a possibility, however it was a lot of work to collate

Joanna noted that there were many invaluable comments that were not able to be incorporated in the results summary. Due to time pressures, this was a raw data summary. As such Joanna advised she would like to provide the CWG with further documentation as comments can be collated. However, she summarised the most important outcomes from the survey:

- there was a strong feeling that people wanted a shift in our approach to water, looking more holistically beyond just the dam solution
- people want to re-think the short list of options
- people felt that the original option 9 (Direct potable reuse) was relevant
- social / feelings generally very concerned
- In particular Joanna felt responses for the following questions were significant: Question 3 – Doubling of population – 84% No Question 4 – Limit population based on water supply – 91% Yes Question 6 – Importance of environmental factors when Council makes development decisions – 85% Very important Question 7 – Should Council consider other options? – 90% Yes Question 8 – Which options? – 96% rainwater tanks, 88% reduction technologies, 86% composting toilets, which was a surprise 84% stormwater harvesting
- Joanna noted disappointing results from the following questions: Question 9 – Use recycled water for drinking? – 39% Yes, 44% No In the affected landholder questions there are a high percentage of Nos, but Joanna believed this was because the questions were not applicable
- Question 12 Affected Landholders: 30 from Byrrill Creek, but only 5 respondents from Clarrie Hall Dam area which she expressed disappointment with as 50 Surveys had gone out there

The CWG Commented on Joanna's presentation:

- Richard congratulated Joanna for her efforts and suggested that the community wants to look more closely at demand management water strategies and TSC has only looked at these issues to a limited extent. He would like to see council go beyond the short-listed options.
- Don believed the results were biased by a large proportion of responses from more rural residents rather than from residents in more populated areas. Joanna acknowledged the focus of this survey was on southern part of Tweed Shire because both dams were in that area however she had emailed out to try to broaden the base, & they were distributed in Murwillumbah too. The surveys were anonymous, & she realized when collating them that a question should have asked what area the respondents lived in.
- Tony asked what the CWG would do with these figures? He suggested the CWG undertake another more comprehensive survey and TSC to sponsor it.



- Sam agreed and asked if Council would fund/sponsor a survey on this to be published in the Tweed Link? There was discussion that there should be opportunities to get a complete survey up and running electronically.
- Rob also congratulated Joanna and added that he doesn't have the time, money or resources to conduct a survey when he's representing Tweed Coast.
- Don advised a survey like this should have gone out to the whole of the Tweed Shire to all 80,000+ residents – Joanna's survey is not a fair representation of responses from the whole community. Joanna commented that she had wanted to reach a wider cross section and in early December had asked Tim to distribute the survey through Tweed Link. But Council did not agree with the content and focus of the survey, so Joanna had to print & distribute it to the best of our abilities.
- Sam disagreed with Don's comments saying that it was a successful pilot survey undertaken.
- Stuart noted that surveys have their place but it is a limited role. The data from Joanna's survey is valid and he would like to see the group thinking through the issues within the focus the Group as a whole in respect to looking at these difficult issues.
- Tony supported Sam's comments as a pilot survey. He also suggested a number of Public meetings in the urban centres and that the information must be supplied more broadly across the community

Further general discussion continued on surveys:

- What do we do with this information? Can we broaden the community base for this information? If it was easily transferable information it's easier to act upon.
- Can Council work out a dollar figure for owners to install a water recycling system? One survey could determine how many people are willing to participate given that amount of subsidisation. If everyone could register on Council's website, it would give an idea on support.
- Tony requested a decision be made tonight on how we go forward.
- David remarked that the CWG was formed as a tool to assist Council to find a way forward for these difficult issues, and to liaise with their constituents in the community. Whilst the idea of an electronic survey is good, the timeframe is unrealistic and Council needs this committee to advise.
- Phil agreed
- Anthony commented that the community group is a representative group that can work through the issues on behalf of the community and the group could pass relevant information on to Council. Council is trying to "go the extra mile" and have a well informed group to inform the selection process.
- Tim advised that Council had considered carrying out a survey as part of the community consultation process. However, a survey of the community won't provide the same feedback as an informed group such as the CWG. At the end of this process the CWG will have worked through complex issues and will have provided Council with informed recommendations that can help the selection of a preferred option. A survey from the community is unlikely provide a sufficient number of responses to Council, and will not provide informed feedback. A Survey that produces responses that can be relied upon needs to be professionally designed with structured questions. As an example Tim referred to 2 sets of questions in Joanna's survey which effectively asked the same



question in two different ways to give a truer indication of the community response. Responses to the first questions showed the community was 67% and 74% in favour of direct and indirect water recycling (both of which involve using recycled sewage for all domestic purposes including drinking) whereas there was only 39% support to the question of "Would you use recycled water for drinking?". Unless the responses are from a very well informed community, the results can not be relied upon by the CWG or Council.

- Tony asked for a professional survey to be undertaken. He understands the extra time implications but believes this would assist the group get an informed consensus.
- Stuart suggested that this group was not designed to be statically representative of 85,000 people living on the Tweed. It was set up as a means to help council better understand the serious issues on the table.
- Cllr Youngblutt asked what about the 4 options? That is what we are here to discuss.

Agenda Items

5. Group discussion – report to large group – how are we progressing?

Stuart asked the Group to participate in an exercise to learn about how others within the CWG are going. Each of the members asked someone else in the group the following 2 questions, and the answers were written down and stuck onto the wall:

- (i) "What have you learned about water supply?"
 - Water is a necessity for life
 - It falls on everyone's roof
 - Everyone needs water
 - Many ways to Supply Water
 - Absolutely necessary for survival of Tweed
 - Demand Management
 - Draft Tweed Water Sharing Plan will affect Tweed Drinking Water Sources.
 - Difference between recycled water e.g. direct, indirect, potable, grey etc.
 - Costly, Precious resource, Wars will be the cost, Just-us, 4 options before us to be decided
 - Difficulty of grasping a balance between conflicting issues
 - Many other options available other than a new dam
 - It is being thought of in silos 4 options Yes + Other factors
 - Unresolved conflict of your role vs path of wider community engagement, Learning about options

(ii) "One thing you have learned about being a member of the CWG?"

- Lotta work
- Constrained and disappointed by not having Council backing
- Concerns within this group seem to be mainly on social and environment
- Real division between the Council and Community
- Expectation of full disclosure of all Demand Water Strategies
- Huge variation in Community Interest & Expertise



- We are being used and will have No Say, It's up to TSC
- Hand tied, Superficial
- Restrictions on confidentiality
- Different expectations
- Not having Council backing for this group
- Decisions are difficult, 4 Options to choose from
- There is NO them & us
- Amount of time it takes to communicate with people.

The CWG then had a general discussion regarding points raised:

- There was a general consensus that there needs to be some additional support from Council to generate further public enquiry and assist the CWG to engage their stakeholder groups and the community.
- Why does it come down to 4 options, why can't we think outside the square?
- Joanna believes that there is not just the 2 dam options and to look beyond.
- Rob commented that if the wall of Clarrie Hall Dam is raised and in trying to sell that to the public, it needs to be packaged with demand management initiatives.
- Does the Group want to take the cheap option?
- Robyn queried why the CWG was given confidential info and then gagged it makes it difficult to inform the community. Anthony responded by advising Council had provided that information to the CWG as early as possible and prior to the information going to a Council meeting tomorrow night. The documents are expected to go on public exhibition after the Council meeting; until then protocol dictates it is not distributed into the public domain.
- Don believes the CWG will not make unanimous recommendations, which will result in Council making its decision without taking the CWG's advice into account.
- Stuart called upon Cllr. Holdom to talk about the position of Council and the decision to be made.
- Cllr Holdom acknowledged there is a public perception that this committee working group has been hand selected, and the outcome has been predetermined. Cllr Holdom reiterated Council's position in that it needs the most informed group, the future of the Tweed's water supply is a huge responsibility and there is no room for error. The CGW must understand and agree that the Terms of Reference is the driver for this Working Group and therefore need to keep focus on the four options, not about demand management – keep the focus on the options. The report to Council will only address the choices.
- Don suggested a full survey of shire is required.
- Cllr Youngblutt agreed with these comments and said Council has has been working on its water strategy (including waterwise reduction) for a number of years.
- Colleen asked what about the next time the supply needs to be upgraded and further suggested water wise options need to be explored

6. Two pronged approach to water – what is meant by Option 5?

Tim congratulated and thanked Joanna for her survey efforts. He then presented a slide show describing the two-pronged approach taken by Council on water related



issues. This approach requires a combination of both reduced water use and increased water supply. In particular it was noted that:

- Water use reduction works have been carried out by Council for many years.
- The results of this ongoing effort can be seen in the considerable reductions already achieved in per capita water use
- Despite these reductions in per capita water use the population will continue to increase and drive up overall water use to the point where additional supplies will be required
- The two components of this two-pronged approach must work together to ensure an adequate and reliable supply of water. It is an integrated holistic approach.



Water Supply

Tim introduced the notion of what has been described by a number of people as "Option 5". He asked the CWG members to think about what this "Option 5" means to you? The CWG members put forward their ideas and these were listed on the whiteboard. Sam tabled a handout for the Group entitled NO DAM (copy attached) and these items were added to the list. Tim then went through the list to explain the status of each action.

What does "Option 5" mean to you?	Considered by TSC	Adopted by TSC	Comment / Investigated in report:
Spread the Risk by utilising many options	>	<	Drought Management, DMS, Options Report
Grey Water	~	option	DMS
Large scale	v	option	DMS
On-site	v	-	Individuals can install
Recycling stormwater	~	option	Rise Development
Respectful & Mindful			
Education	v	v	
Fines	Х	option	DMS
 Meter every connection 	 Image: A second s	v	
Charge for water use	v	~	
Water Restrictions – permanent	~	~	DMS



What does "Option 5" mean to you?	Considered by TSC	Adopted by TSC	Comment / Investigated in report:
New development	~	>	DMO
Self-sustainable	v	option	DMS
 Own water collection 	~	option	& Technical Depar
 Stormwater harvesting 	v	option	rechnical Paper
Dual reticulation - new development	~	option	DMS
Recycling wastewater (indirect pot.)	~	Х	DMS & Options Report
Stormwater harvesting	~	option	DMS
Brighton underground storage	2	-	Technical Paper
New development pays for new	~	<	
supply			
Funded rainwater tanks	~	option	DMS - Decision pending
Integrated response	~	>	
 Regulation 	×	v	8.
 Incentives 	v	>	
 Education 	~	>	Billo
Environmental flows	~	×	Water Sharing Plans, Secure Yield, DMS
Waterwise – continuing	~	\$	IWCM & DMS
Self-sufficient rain tanks	~	option	DMS & Technical Paper
Direct potable water - recycling	~	Х	Options Report
Composting toilets	Х	option	Individuals can install
Garden landscape design	~	2	DMS
Population cap	Х	Х	

* DMS – Demand Management Strategy, IWCM – Integrated Water Cycle Management Strategy

There was a good deal of discussion during the presentation:

- It is not common knowledge if Tweed did actually do a water wise program in the past, if it is continuing or if it is finished?
- Usage reduction technologies showerheads etc,
- TSC only limited efforts to date
- More recycled water
- Population projections in the MWH report require further explanation
- Question: What is the per capita consumption of water represented by the blue demand managed line? To be confirmed on the question register
- Question: Is it a requirement to submit a DA to Council to use grey water? To be confirmed on the question register
- The community needs to be educated to be respectful and mindful of water use
- Look to make new developments selfsustainable eg The Rise stormwater reuse
- Major developments are approved under Part 3A of the EP&A Act and as such Council is not the determining body and can only provide comment
- Is it correct that a reduction in block sizes would actually create higher population than previously quoted and therefore more demand? Response in question register.
- Question: Is the Cobaki population now reduced by 30% in what was predicted? Response in question register.
- Tony referred to 2 emails where he did not get a response. Tim responded that the first query will be in the next question register update and the second had been addressed. Tony to contact Tim if further clarification needed.



- We all depend on Tweed river to provide us with water
- Need to have water storage
- Ipart only regulates the major metropolitan water authorities. Council's water supply function is regulated by the NSW Office of Water and the Department of Local Government.
- Questions in relation to confidence levels and quality assurances and how technology changes rapidly. Will Council build a business case with independent expert review?
- Waterwise message and approach education needed generally the public is a long way from being waterwise How do we get the community to be personally responsible for their own water use? (take it to the next level)
- The Demand management message from Council can be clearer.
- There is also some confusion regarding what is considered Demand Management and what is considered Water Supply.
- Rob would like to see the options on the slide show be integrated into selling this package to the residents of Tweed Shire ie raise the Clarrie Hall Dam with a package of these options needs to be marketed better
- Joanna A slide presentation of Water Supply, Demand Augmentation & Options is what was presented by Council at the Uki meeting
- Council has discounted grey water may look at again down the track.
- Integrated Water Management Strategy is a rolling strategy.
- To reduce the consumption of water we need to reduce the demand / plus recycled water / securing additional supplies

Stuart suggested that the interest in what has been called an "option 5" shows that demand management is obviously important to all CWG members.

Tim noted that:

- The actions listed by the CWG are demand management actions.
- Demand management must play a significant part in any solution.
- Council has investigated almost all of the demand management actions proposed, and has committed to adopting many of them.
- The actions proposed in "Option 5" already provide the foundation for each of the four water supply options (through Council's demand management strategy).
- "Option 5" will not be added to the list of 4 short-listed options.
- The CWG is being asked to look at the water supply "prong" only by examining the four short-listed options required to increase the water supply.

7. Understanding the four options & Multi Criteria Analysis – presentation

Mark presented a slide show on analysis of the 4 options as was used during the Course Screening Report (copy attached). A similar methodology is proposed for this fine screening of the four options.

Mark described the four short-listed options:



- Raising CHD: capacity now 16,000ML to 42,3000ML (capacity beyond 2036) Cost Est \$30m
 - Additional capacity beyond the planning horizon due to earthworks economies
- New Byrrill creek dam: Capacity 16,300Ml to 36,000Ml higher elevation Secure yield method of modelling performance of the catchment
- Pipeline to SEQ Water Grid (SEQ has largest water supply outside the Snowy Mountains Scheme) Pipeline length 7km, 500mm dia, Cost \$9.1m
- Contingency Option Short Lead time enough to get out of trouble \$39m Groundwater plus pipeline to Rous & pipeline SEQ

Question: What is a Multi Criteria Analyses?

- Triple Bottom Line (TBL)
 - 1. Environmental
 - 2. Social
 - 3. Economic considerations
- Quadruple Bottom Line Sustainable Development (QBL)
 - 1. Environmental
 - 2. Social
 - 3. Economic considerations
 - 4. Sustainable Development
 - 5. Governance
- This study involved 10 assessment criteria. These criteria can be grouped into the 4 QBL.
- A matrix of 10 criteria x 9 options = 90 criteria.
- There is no definitive answer. CWG can argue the weighting factors for ratings.

What are weightings?

- The weightings give the relative significance of each of the criteria when compared against each other.
- Mark made the point that the weightings can be changed to suit a particular viewpoint, however there is still only one "pie" to carve up and there needs to be a balance.

How is a Score determined?

- The ratings represent the relative characteristics of each criterion for each option.
- The weightings in each criteria are the same for all options.
- The final score for each option is: Weighting x Rating = Score

Mark outlined the results from the Course Screening

- Rank 1 Raising CHD
- Rank 2 New Byrrill creek dam
- Rank 3 Pipeline to SEQ Water Grid
- Contingency Option 2 pipeline options plus groundwater

The presentation generated some questions:

• Question on how secure yields are calculated and how they might be affected by environmental flows. To be confirmed in question register.



- Question on adequacy of SE QLD water Grid yield. Mark explained that all the data suggests there is more than adequate capacity. The combined capacity of the system is far greater than just the sum of the individual parts. Drier areas of the system are being used to store water from other higher rainfall areas thus increasing the yield from dams that would otherwise overtop more often during periods of flood.
- Some discussion over how much influence the CWG has on the criteria? The CWG will be invited to look at the environmental and social criteria and are welcome to review the weightings applied across all the criteria.
- Have we fairly represented the weightings? It is envisaged that the CWG will provide valuable recommendations on the weightings for the MCA.
- Shouldn't the environmental weighting be higher particularly for Byrrill Creek? The weightings are constant for all options and represent the relative importance of the individual criteria. The ratings will differ for each option based on these types of issues. The final score for each option is Weighting x Rating = Score
- Richard asked about a 200mm pipe that exists between NSW and QLD. Anthony Burnham advised the pipeline has a metered connection however, the valve has remained closed since mid 1980's.

8. QUESTIONS

Stuart asked for further questions and feedback on issues of interest or concern:

- Joanna provided hand out in regard to Byrrill Creek dam (see attachment)
- Council needs to put forward an overall business case for the preferred option
- Richard asked if anyone is opposed to CHD raising?
- Don asked if any of the 4 options will be discounted before the end?
- Robyn said that building Byrrill Creek dam would spread the risk of rainfall catchment.
- Don asked if the water in Byrrill Creek and CHD feed into each other? Maybe look at doing both over a staged timeframe?
- Rachel asked how planning takes into account climate scenarios AB can provide general outcome of studies done in SEQ and for Rous water and general info to show relativities.
- How will Macro water Sharing Plan affect the options?
- How are environmental flows included in the analysis?
- How do we contact people in our region? We need to get as many people involved as possible – how do we do that? Members can go to the media and speak as individuals. Maybe a public meeting and this requires council help. Possibility of a survey or factsheets? Give the whole community a voice. Use of Tweed Link.
- Tony showed concern with contours of old verses new for CHD for volume calculations
- Wet and dry seasons, need to have significant storage to harvest water
- Don asked what we are going to do with the BCD dam site if it does not go ahead





Anthony said that Council will consider closely what has been said tonight

9. Ratify terms of reference

Stuart requested a show of hands in favour of passing Terms of Reference:

- Majority Agreed to Terms of Reference
- Tony qualified his acceptance by saying that the demand management side of the solution needs to be included in any recommendation of a preferred option.

Moved: Cllr Dot Holdom Seconded: Cllr Phil Youngblutt

9a Potential visits to CHD, BCD and Bray Park Weir

Joanna proposed that to make an informed decision a field visit to the sites was needed. Tim asked for a show of hands . The majority of the CWG confirmed it wanted an inspection of 3 sites being CHD, BCD and Bray Park Weir.

The CWG agreed that prior to the next meeting on Monday 1 February, the Group meet at the Civic Centre at 12pm for ½ day inspection of the 3 sites. Council will organise coach for transport, returning in time for Meeting No 3 at 5.30pm.

9b Request by Robyn to change day of 15 Feb meeting

Majority denied change of date – no change. Meeting dates remain as previously confirmed:

- Monday 1 February (site visit 12pm meeting commences 5.30pm)
- Monday 15 February 5.30pm
- Monday 1March 5.30pm

9c Next steps including pre-work for meeting 3

Tim distributed 2 reports to the Group:

- Combined Demand Management strategy (Combined, Stage 1 & Stage 2)
- Environmental and Flora & Fauna reports on Clarrie Hall Dam and Byrrill Creek areas (reading for homework in preparation for Meeting 3)

Stuart asked the Group to think about the environmental impact & community/social impact in relation to the 4 options.

- Meeting 3 will have a focus on Environmental impacts
- Meeting 4 will have a focus on social impacts
- Meeting 5 will bring the all of the considerations together to provide some advice to Council

He also asked the CWG to think about what does council know or need to know to make this decision?



Joanna suggested that speakers with knowledge of the environmental issues at the sites attend the site visit and/or as a guest speaker at the next meeting. She suggested Tom Alletson and Mark Kingston would be good speakers.

10. Reflection - what did we learn tonight

Stuart asked members of the Group what they have learned tonight:

Responses:

- What a Multi Criteria Analyses is
- All people of the whole Shire need to have a say or leave it to TSC
- TSC is apparently doing a lot to decrease demand on water resources
- Council needs to better explain what is the demand management strategy including what has been done and where it is heading and how this message is taken to the public
- There is a lack of awareness and understanding of TSC long term demand management strategy and IWCM.
- Council may revisit some other options for water supply requirements past the end of this 30 year planning horizon.
- That CWG is expecting more hands on resources to help them get message out. TSC was expecting CWG to do more of this.
- Clarified TSC's view of CWG as a community focus group, but not resolved CWG views re wider community engagement
- [We're] Making Progress
- Concerned about data sources and their interpretation

11. Next Meeting:

The next meeting of the Committee will be held Monday, 1 February, at 5.30pm. Note that the site visit will leave from out the front of the Council Offices at 12 noon Monday, 1 February. The site visit will return in time for the meeting to start at 5:30pm.

12. The meeting closed at 8.50pm

Attachments

Tim: Presentation - Two pronged approach to water

Mark: Presentation - MCA of the 4 Options

Sam: Caldera Environment Centre Statement & Proposal: No Dam

Joanna's: An Overview of the Byrrill Creek Dam Area

REPORTS GIVEN TO CWG 18 January 2010

MWH Tweed Shire Council Demand Management Strategy A1187200 – December 2009

MWH Tweed Shire Council Demand Management Strategy – Stage 1

MWH Tweed Shire Council Demand Management Strategy – Stage 2 Non-Residential Program Evaluation A1187200 – December 2009

(all bound together)

Natural Heritage Trust The Restoration Prioritisation of High Conservation Value Riparian Lands of the Upper and Mid Tweed River. A Preliminary Survey Using a Rapid Assessment Approach.

Northern Rivers Catchment Management Authority Byrrill Creek Riparian Rehabilitation Plan – March 2006

Peter Parker Environmental Consultants Pty Ltd Byrrill Creek Forestry Venture An Environmental Assessment of Selected Harvesting – August 2000

Peter Parker Environmental Consultants Pty Ltd Byrrill Creek Reafforestation Programme A Flora and Fauna Assessment – December 1998

Greenloaning Biostudies Pty Ltd Proposed Raising of Clarrie Hall Dam – Final Report April 2008

(all bound together)

Tweed Water Supply Augmentation

A two pronged approach to water

Presentation to the Tweed River Committee 21st January 2010 Tim Mackney, TSC Water Unit on secondment from NSW Public Works

Tweed Water Supply

Determining a Preferred Option







Tweed Water Supply

Determining a Preferred Option



Tweed Water Supply

Determining a Preferred Option



Tweed District Water Supply Augmentation Options Study

The Four Shortlisted Options and the Multi Criteria Analysis

Community Working Group Meeting No. 2 18 January 2010





BUILDING A BETTER WORLD

Option 1: Raising Clarrie Hall Dam

Multi Criteria Analysis: Rank 1

Description	Existing Dam	Proposed Raising
FSL	61.5 m.	70 m.
Height	43 m.	51.5 m.
Capacity	16,000 ML	42,300 ML
Secure Yield	13,750 ML/annum	22,000 ML/annum
Cost	\$ 12.9 million 1983	\$ 30 million

Option 2: New Byrrill Creek Dam

Multi Criteria Analysis: Rank 2

Description	16,300 ML Dam	36,000 ML Dam
FSL	115.5 m.	125 m.
Height	30.5 m.	40.5 m.
Capacity	16,300 ML	36,000 ML
Secure Yield	9,000 ML/annum	16,000 ML/annum
Cost	\$ 38.3 million	\$ 56.4 million

Option 5: Pipeline to SEQ Water Grid

Multi Criteria Analysis: Rank 3

Description	Proposed Works
Length	7 km.
Size	500 mm dia.
Capacity	20 ML/day
Cost	\$ 9.1 million

Contingency Option: Short Lead-time

Description	Pipeline to Rous Water	Pipeline to SEQ Water Grid	Groundwater
Length	18.3 km.	7 km.	0.3 km.
Size	300 mm dia.	300 mm dia.	200 mm dia.
Capacity	5 ML/day	5 ML/day	4.3 ML/day
Cost	\$ 11.8 million	\$ 5 million	\$39 million



Multi Criteria Analyses

Triple Bottom Line

Quadruple Bottom Line (Sustainable Development)

- Environmental
- Social
- Economic

- Environmental
- Social
- Economic
- Governance

Assessment Criteria for this Study

- Environmental
- Social
- Economic

Governance

- Environmental Constraints
- GHG & Energy Consumption
- Social Acceptability
- Cultural Heritage Impacts
- Established Technologies / Feasibility
- Lead Time & Escalation
- Costs (Capital, Operating, NPV, \$/ML)
- Secure Yield
- Planning Obligations
- Legislative Acceptability

Multi Criteria Analysis - Process



Weighting Factors for all Options



Raising Clarrie Hall Dam - ratings



New Byrrill Creek Dam - ratings



Pipeline to SEQ Water Grid - ratings



Raising Clarrie Hall Dam - scores



New Byrrill Creek Dam - scores


Pipeline to SEQ Water Grid - scores



Shortlisted Options and MCA

End of slides

Time for discussion and questions



AN OVER VIEW OF THE BYRRILL CREEK DAM AREA Joanna Gardner

Background On Dam:

1977 Reconnaissance Engineering Geological Survey of NSW, & Dept Public Works NSW

1978 Geological Survey of NSW, Feasibility investigation on Byrrill & Doon Doon Site

1980-1982 Clarrie Hall dam built

1983- Caveats placed on affected land in Byrrill Creek from this date.

1986 -Council purchases Wades land (1,131ha) at back end of Byrrill Creek.

Land leased to Ken Morrow for cattle adgistment

1993- Joint NSW Forestry & Council Forestry Plantation on 230ha of the land. Maturity 25-30yrs 1998- 2000 Council plants an extra107ha & 56 ha

2004- NSW Dept Commerce: Construction of Byrrill Creek Dam & Cost estimate for 16,000ML dam 2007- SMEC commissioned to investigate dam at Rocky Cutting, Eungella

2007- Byrrill Creek Dam @ 16,300ML costed at \$38.3 million.

2009 October- NSW Dept Works (designer of Clarrie Hall Dam) commissioned to look at a larger 40,000 ML dam at Byrrill creek with estimated cost initially @\$51 million, & now @ \$58.4 million

Affects of Proposed Dam:

The dam wall would be located at "Pretty Gully". It would be an earth & rock fill dam with the spillway height at 125 mts, and 50 mts wide. According to the Geology Reports "the site has some severe geological problems, the main one being the considerable depth of weathering on each abutment,...High leakage conditions have been encounteredwhich would commit the site to a fully lined spillway. An extensive program of grouting would be required to establish an effective grout curtain"

Expected cost is \$58.4 million for the larger dam and the catchment area is 53 square km. The amount of land inundated is 400ha for a 40,00ML dam & 240ha for the 16,000ML dam. 6 dwellings would be flooded, one of them council owned. The dam would affect 24 land owners:14 at Pretty Gully & 10 others. The dam does not just flood Byrrill Creek valley, but also Kunghurloo & parts of Mebbin Springs. Peter Vanlieshout loses approx 1/3 of his land. Access roads to 18 people's property would be affected.

The road west to Tyalgum would be flooded from Pretty Gully & due to terrain and cost, it probably would not be replaced. Many people who live on the Tyalgum end of Byrrill Creek would lose their access to Uki & Kyogle road. Access to Mebbin National Park would be via Tyalgum, or Cadell Rd, the Camp ground would only be accessible via Cadell Rd, not Tyalgum, unless a bridge was built, which is highly unlikely.

Conservation Value of Byrrill Creek:

Byrrill Creek Valley is a biodiverse wildlife corridor that links Terragon, Mebbin National Park, Wollumbin National Park & State Conservation Area, & ultimately Mt Warning National Park. In 1995/96 the Byrrill Creek Landcare group received funding of \$3,264 for 2 projects, to stabilise & revegetate along the creek banks.

The Tweed Catchment Stressed Rivers Assessment Report 1999, identified the Byrrill Creek subcatchment area as the highest conservation value riparian area within the Tweed, because of its high proportion of riparian vegetation cover, and high percentage of diversity of wet flora species and schedule 1 & 2 wet fauna species.

A further 2 Surveys, Tweed Landcare Ecosure in 2003, and the 2004 Tweed Council Vegetation Management Survey supported this view, rating it as the best ecological condition, & highest biodiversity within the Tweed Shire.

During 2007 to 2009 Byrrill Creek has been part of a Northern Rivers Catchment Management Authority Riparian Rehabilitation Scheme to manage weed infestation, in which 73% of land holders with riparian zones along the creek participated. Total funding was \$350,000

In 2010 Byrrill Creek will be part of the Northern Rivers Catchment Management Authority project, to enhance landscape connectivity, through strategic wild life habitat corridors, using revegetation & rehabilitation of existing native vegetation. Funding for this project is \$63,000.

Total funding for all of the above projects is \$416,264 plus in kind labour contributions of \$154,342 by land care members.

In July 2009 I collated a 45 page Byrrill Creek Wildlife Survey in which 20 property owners & residents participated. 15 species of vulnerable, endangered & threatened species (both State & Federal Acts) were recorded. The Survey also showed that both southern & northern ridges along the valley were core Koala habitat areas & that narrow sections of the creek & road were used as corridors by koalas accessing either hillside. This was also backed up by Rhonda James Koala survey, which is part of the Council's own Vegetation Management Strategy of 2004. Why spend all this energy, time and money to restoring a high quality conservation area to then flood it all?

The Stressed Rivers Assessment Report DLWC 1998 classified Byrrill Creek as category U4, being of low environmental and hydrology stress, due largely to the low levels of water extracted from the creek. Doon Doon Creek, however has water extraction rates that create medium levels of environmental and hydrology stress to give it a stress rating of S4. A dam on Byrrill Creek is therefore likely to create considerable environmental stress as well as the destruction of habitat of the Giant Barred Frog (Threatened EPBC Act), Bush Hen (Amaurornis olivaceus,) (T: EPBC Act) the Powerful Owl (Ninox Strenua) & the Barking Owl (Ninox Connivens) (Both T:EPBC Act) and the numerous Platypus, who have all been recorded living within or close to the creek in the proposed dam catchment area. The dam would also limit Koala migration and breeding patterns.

CALDERA ENVIRONMENT CENTRE (TSC, WAP, CWG, CEC, Statement and Proposal)

NO DAM

Tweed Shire Council 'Water Augmentation Plan' has been announced as necessary and in process. "Community consultation" has been announced around 4 shortlisted options, options which have been determined by Council, ... prior to any –"community consultation"– process. Options presented are all engineering based solutions, constructed around questionable assertions.

Shortlisted options proposed within the said plan include:

- A new dam and the flooding of the highest riparian conservation value land in Tweed Shire at Byrrill Creek;

- Increasing the height of the dam wall at Clarrie Hall Dam an additional 8 metres, flooding significant areas of farming, residential and forested land;

- Installing a pipeline to SE Queensland capable of taking water both ways, shipping water into the Caldera (from the non-sustainable desalination plants of the Gold Coast), or, shipping water out from the Caldera (to the on-going non-sustainable development of the Gold Coast).

Council have invited community consultation, though have presented the shortlisted options as the only alternatives under consideration. Significantly changing the water use practices of residents, to eliminate the need for additional water, has not been properly implemented to date.

The Caldera Environment Centre is actively opposed to all of the shortlisted options presented by Council and seek the re-opening of the shortlisted options selection process and the inclusion of a New Option: **"The Wise Water Use Option"** for all new mass housing developments, introducing the following requirements:

High Volume On Site Rainwater Collection and Extended Use – We seek a More Realistic Approach by the Health Department to the Regulations concerning The– Collection–and–Use–of–Rain–Water. We live in The Countryside, we drink the 'Rain–Water' here, the Rain–Water is good, we have 'Rain–Water–Tanks' which supply 'Whole–of– House–Use'. For the currently in process Mass–Housing–Developments it is illegal to build using Rainwater–Collection for Whole–of–House–Use. The new Mass Housing Developments can be re–designed to collect rainwater for Whole–of–House–Use (40,000 litre <u>minimum</u> storage per Household, held in common underground reservoirs).

Large Scale Grey Water Recycling on Site and Integrated Storm Water Harvesting – Dual reticulation systems are already in place elsewhere, eg in Rouse Hill, Sydney, since 2001 (57% of water used is recycled), within the WRAMS scheme for Sydney Olympic Park, and such systems are under construction at Hoxton Park and Ropes Crossing at St Marys. The NSW Govt. through the Water for Life Programme recommends that Local Council's adopt such systems for new housing developments. A Reconsideration of Option 9, the Mass Distribution of Direct Potable Recycled Water – option 9 was discounted as "unproven in Australia" – even though this method of water recycling has been in use for decades in Europe and Asia and the technology is readily available. The proposed new developments are all in close proximity to the waste water treatment plants at Banora Point and Kingscliff. The above Rainwater Collection Tanks can be used for drinking water to allay concerns about drinking recycled water.

Promotion of Composting Toilets as a legitimate alternative to water based sewage treatment – 20–40% of indoor domestic water use is flushed down the toilet. Hydraulic solutions create many problems, including: significantly increasing the volume of sewage which must be treated, and that water needs then to be filtered clean for discharge or reconsumption. Approximately half of the Council budget goes on water distribution and sewage processing and treatment. Dry composting toilets are water-free and dealt with on-site.

Proper Garden and Landscape Design – 50% of outdoor domestic water use is used to water inappropriately designed gardens and public landscapes.

Proper Urban Demand Management – including limiting the planned population increase in this area (rather than doubling the local population, as is 'currently-in-process').

We recognise the limitations of the NSW Government Planning processes place on some of the Wise Water Use components, though believe that Tweed Shire Council has the obligation to challenge and modify these restrictions, as the representative body of the Caldera residents, and serving the interests of the shires biodiversity value.

The planned mass housing developments are being designed as unsustainable.

We want the introduction of "The Wise Water Use Option": mandatory sustainable design of the proposed mass housing developments.

We don't want Byrrill Creek dammed and flooded, it is the highest riparian conservation value land in the Shire, it is irresponsible and provocative to propose the flooding of Byrrill Creek.

The above statement is the Formal Statement of the Caldera Environment Centre for submission to the Working Group for the Tweed Shire Council Water Augmentation Plan.

The Caldera Environment Centre proposes, and seeks the support of other Working Group Members for:

- 1. The reopening of the process of the selection of the shortlisted options, and
- 2. The inclusion of the Wise Water Use Option for consideration as an option, and
- 3. Community input into the process of the selection of the options to be shortlisted.



Minutes of the Water Supply Augmentation – Community Working Group Meeting held Monday 1 February, 2010

Venue:

Canvas & Kettle Meeting Room

Time:

6.05pm - 9:25pm

Present:

Facilitators	Stuart Waters (Twyfords)
	Tim Mackney (Public Works)

Rachel Eberhard (Tweed Heads); Rob Learmonth (Tweed Coast); Tony Thompson (Murwillumbah); Samuel Dawson (Environment); Richard Murray (Environment); Robyn Lemaire (Water User); Colleen Edwards (Landholder: Clarrie Hall Dam Area); Joanna Gardner (Landholder: Byrrill Creek Dam Area); Cr Dot Holdom (Tweed Shire Council); Don Beck (Business/Commercial); Pryce Allsop (Business/Commercial); David Oxenham, Anthony Burnham, (Tweed Shire Council Staff); Mark Hunting (MWH). Geraldine O'Flynn (Southern Cross University)

Apologies:

Cr Phil Youngblutt Michael Wraight (TSC) Jackie MacDonald (Aboriginal Advisory Committee)

Objectives:

To be a forum that will / where:

- establish and build positive relationships between the Council, key stakeholders and the broader community
- support two-way communication with key stakeholders and the broader community
- provide information to stakeholders and the broader community about the options, assessment processes and issues used to determine a preferred option
- provide feedback for stakeholders and the broader community on the options, assessment processes and issues used to determine a preferred option
- members can work together to identify environmental and community impacts of the options and to provide feedback on their prevention, minimisation and mitigation



- members can work together to identify opportunities for Council to communicate and consult with the broader community, and to provide feedback on the Council's consultation and communication plans and activities
- draft a report representing the views, interests and issues of members together with a summary of CWG recommendations for consideration by Council

Prior to commencement of this Meeting, the Community Working Group completed a site visit of the proposed inundation areas from 12:00 - 5.30pm. Notes from that site visit are provided under separate cover.

Meeting commenced at 6.05pm

1. Welcome

By Stuart Waters and he thanked the CWG for participating in the site visit today.

2. Minutes of Previous Meeting:

The CWG reviewed minutes and there was brief discussion about the amendments noted. Tony commented he would like to see the Weightings for the Multi Criteria Analysis (Item 7) be reflected in a Bar Chart not a Pie Chart.

Don requested that any changes/amendments to minutes of meetings forwarded to the CWG must be done by a more confined timeframe to avoid going backwards and forwards on the night to make further alterations – the CWG agreed in principle.

Moved: Cir Holdom Seconded: Rachel Eberhard

RESOLVED that the Minutes of the Water Supply Augmentation – Community Working Group meeting held **Monday 18 January, 2009** (as amended) be accepted as a true and accurate record of the proceedings of that meeting.

3. Business Arising from previous meeting:

3a. General

Joanna requested clarification on the role of the CWG. Is it purely to look at supply? How can the CWG make a decision purely on supply when it must be both supply and demand? Why is the CWG here to look at supply when we don't have any information on demand?

Tim agreed that both were required to be looked at side by side. The demand side of things is an imperative for all water authorities and Council has made this the foundation in its approach to water. Council will continue to focus on this demand foundation regardless of which supply option is chosen.



Sam read a statement to the CWG (copy attached) which propose to delay the decision to be made by CWG until a demand management strategy can be assessed completely.

3b. Terms of Reference

Richard regarded that an amendment to Terms of Reference had been discussed at the last meeting, and that this should be reflected correctly

Richard then asked that the words "the demand management side of the solution" needs to be included in any recommendations in the preferred option.

Rachel cautioned that if we adopt a change to the Terms of Reference we open up a whole new area of debate. The CWG has a lot of work to cover the four short-listed supply options, and to try to cover demand as well will mean the issues to consider grow considerably.

David Oxenham advised the Terms of Reference identify the 4 options which is what the CWG is here to discuss. Council's resolution was that the CWG was formed to focus and ultimately make recommendations on the four recommendations. The CWG's role is to assess the environmental and social aspects of these four recommendations. It is not possible for the CWG to broaden these Terms of Reference without a new Council resolution.

Joanna said the CWG needs another month to look at all these options – it is being rushed. Joanna asked for more time to explore the commercial effects together with the environmental and social impacts.

Stuart asked Council if the timeframe is fixed?

David Oxenham advised it would be a major consideration to change the timeframe. The CWG is here to investigate the four options in detail both the environmental and social impacts and prioritise.

Pryce acknowledged his focus was to make a choice from one of the four options.

Stuart reconfirmed to all that the CWG may deliberate to advise Council that the recommendations of the CWG report could state limitations of process (eg time, knowledge). The CWG should accept these limitations and get down to some thinking about the options.

Tony advised he is feeling rushed and wants the facts and figures checked. He doesn't want to see this drag on forever but the decision needs to be made correctly. Tony wants to see the amendment to the Terms of Reference included. Council employees are employees of the public and cannot tell us what we can and can't have as a Term of Reference.



Don suggested that the Council has been elected by the whole community and is in the position of making these decisions on the community's behalf. He asked what Council has already done on DM issues?

Rob reiterated that when this is presented to the public it must be from a holistic viewpoint, in that the CWG chooses option X which is supported by this demand management strategy.

Anthony Burnham advised that we have a demand strategy in place for 12mths building on NSW BASIX requirements. Council have been looking at this for more than 18mths but has had a disappointing response from the public. A demand management strategy report on residential water use was produced in 2007/8. This covers approximately two-thirds of the total water use in the Shire. The report was put on public exhibition and was adopted by Council in Feb 2009. The second stage focused solely on commercial areas and is currently on public exhibition.

Richard interjected -Stage 1 is not complete just yet. It has been altered. Why shouldn't the CWG report on demand management as well?

Tim said that the CWG has the opportunity to make recommendations within the report that include demand management issues. However the CWG needs to keep the focus on the 4 options or risk not producing an outcome. He suggested keeping Terms of Reference as is but reiterated that the CWG has the opportunity to make other recommendations within the report. In this way we still have our focus. The difference between this and changing the Terms of Reference has been pointed out by Rachel previously; if we change the terms of reference the issue will grow and grow without a definite end point.

Anthony Burnham said from a process point of view, Council does not allow us to widen the scope of the Terms of Reference and that the CWG should not vote to do this. As staff, we have very much heard that we must double our efforts in demand management in presentation and general awareness to the residents. We have heard that message and are happy for the CWG to make a recommendation to Council to focus on that area and that will be formally recognised.

Richard did not want these demand issues to be ignored.

Anthony commented that this would not be possible given the combination of requirements by government authorities and community expectations that Council continues to pursue demand management actions. It is a natural progression, and in fact this ongoing interest assists Council to implement the necessary actions.

Discussion continued informally between members during a short Dinner Break Dinner Break ended at 7.08pm

Tony Moved to Motion:

That the Community Working Group has the ability to attach caveats to the recommendations made to Council that include advice regarding Demand Management.



MOVED: Tony Thompson SECONDED: Richard Murray

Stuart asked for a show of hands for All In favour of the above Motion: 8 All those Not in Favour: 2

MOTION CARRIED

Stuart added this will now be added to Terms of Reference

4. Group discussion – report to large group – Consolidating data gathered during site visit

Stuart requested 3 groups form to discuss some of the issues from today and what they saw. Each group listed issues on large pieces of butcher's paper under several headings.

What are the environmental issues we learned/viewed today?

- Depth & Breadth of Issues
- Environmental Flows
- What is the extent of total clearing of Veg
- Access for construction issues
- Access/or not after completion
- When last studies F/F done? Threatened / Endangered
- Aboriginal and Cultural Heritage both dams
- How will it impact on commercial activities both dams
- How much deforestation?
- Water quality issues
- Threatened species everywhere
- Environmental flows Tweed & Doon Doon, BC
- Social impacts CH & BC
- Economic value of farmers/tree plantations
- Large scale clearing bulldozers and barges
- Impact on the National Parks
- Roads relocated EIS
- Scale of both CH & BCD is HUGE
- Capacity of CH affect choices
- Salinity/Fresh H2O fish passage /climate change
- Saw nothing that was not solvable both sites.
- Loss of further property at CH not large
- CH Already changed habitat therefore not as great impact
- Time frames important for loss / regeneration of flora and habitat
- Loss of exceptional habitat at BC
- At BC surrounding area not good
- BC is pristine
- How much BC native vegetation
- How much BC old growth



- Fish ladders required at BC for dam

Which of these issues are the most important to you?

- Byrrill Creek Very shocked by damage to bio-diversity BUT Clarrie Hall valleys not seen may have some diversity.
- Clarrie Hall seemed already utilised as a dam
- Loss of only major recreational park Crams Farm
- Byrrill Creek loss would reduce another tributary to Tweed.
- No site has insurmountable problems that can't be solved.
- BCD pristine, unique riparian environment
- Raising CH has less environmental impact than a new dam
- Scale of both CH & BCD overwhelming lost habitat and forest
- Trash something that's already trashed
- Mebbin National Park impacts access and inundation
- Threatened species/Aboriginal Heritage sites
- Not willing to sacrifice to go forward
- All of concern min impact for best outcome
- Environment Important people important. How to choose?
- Very big call/decision
- Trade off one site vs other site
- Potentially environmental calculated gamble endangered species
- BC is unique if can't rehabilitate this area, then not much chance at other locations.

Which environmental issue would be most significant to the residents of Tweed Shire?

- People from coast want to come and see natural forest environment.
- Trash what is already trashed
- Intergenerational equity.
- Loss BC x 3
- Sites selected over 25yrs ago
- Joe Public about iconic fauna eg platypus
- Where water to come from?
- Joe Public becoming more aware
- Joe Public becoming more aware of Water Quality Issue
- Environmental flows not well understood but people care about fish in rivers.
- Water quality
- Secure supply
- Access to National Parks
- Loss of recreational area at CHD
- High ecological value of BCD
- Decision today long term repercussions for the future
- Threatened species overall at BC & CH

What are the key environmental issues at Byrrill Creek dam?

- High quality preservation area loss/sacrifice.
- BC could be managed as was CH very well to not significantly affect



environment.

- Threatened species/endangered
- Aboriginal/cultural heritage
- Vegetation loss quantum
- Native vegetation loss
- Road impacts access / construction of
- Impacts of water quality
- Environment River flows
- Access to the National Park
- Intergenerational equity
- Environmental Flora endangered and other
 - Koala corridor
 - Platypus habitat
 - Giant Barred Frog
 - Silt dam erosion downstream
- Impact on National Park
- Downstream flow changes
- 400ha clearfelled
- 2 dips toxic chemicals

What are the key environmental issues at Clarrie Hall Dam?

- Current state of water quality
- Lack of wild life
- Environmental flows
- Upper catchments parts have relatively pristine vegetation
- Aboriginal/cultural heritage
- Shorter term loss of wet land habitat
- Inundation of smaller area vs BCD
- Inundation of farm land
- Rainforest pockets
- Wetlands transition Jacana birds
- Flow changes downstream
- Mt Jerusalem National Park effected small
- All farmland lost better water quality
- Clearing extra 8m along entire dam Barges & dozers

Which of these is more important?

Stuart then requested members to write down the three most important issues to them on individual pieces of paper. Members were then asked to position each issue on the wall to signify its relative importance for them. The results are shown in Table 1 attached.

Stuart asked the CWG to decipher from the Sticky Wall presentation, what was the standout issue on the wall?

Sam: Water doesn't feature heavily.



- Pryce: It appears the single issue is habitat. There is a greater resistance to disturbing the natural environment.
- Rob noted the most significant issue is that Byrrill Creek is a more pristine environment and there appears to be a greater sacrifice at Byrrill Creek. The damage is already done at Clarrie Hall Dam.
- Stuart noted that this exercise gives us a good snap shot of what we're thinking after our sites visits today. It may well change is we do it again but it offers us a good indication and information all the same.
- A question asked whether any studies had been completed in relation to changes to habitat after Clarrie Hall Dam was constructed. Mark Hunting advised there has been a study (which was given to the CWG last meeting) that documents the species of the area and suggests which have come about due to changes in habitat. It is fair to say that some species increased and some decreased.

Further Questions

- Rachel asked for information on downstream flows they have not been looked at.
- Joanna agreed with Rachel and then briefly discussed the handout supplied to the CWG entitled "Appendix 32: Summary of Stress Classifications for Tweed Catchment" taken from Stress Rivers Assessment Report for Upper Areas of the Tweed. Joanna then asked the CWG to review her handout "Environmental Effects & Considerations for the Proposed Byrrill Creek Dam" and also a letter from Rhonda James, Restoration Ecologist. These addendum should be read in conjunction with the handout provided last week to provide an overview of the effects on Byrrill Creek.

5. Additional Community Consultation:

5a. What are the specific objectives of additional community consultation?

Stuart asked the CWG the above question and responses were noted on whiteboard as:

- Awareness
- Public express point of view
- Information then questions e.g. Tweed Link special Link Members on committee
- Report goes out to community for feedback
- Consultation won't work
- Look long term 2036
- Public meetings education and feedback
- Public Information Sessions M'Bah/ Tweed/ Kingscliff



- Survey
- Local Magazine
- Simple survey 75% return
- 1 day exhibition
- Exit survey design
- Pre-Report
- Web another tool, another pathway
- The print size in the Question Register is too small.

Pryce said that the CWG's thoughts are on the board, but can an expert advise that Byrrill Creek is a more vulnerable site?

Joanna would like to see some sort of an environmental comparison be compiled – a bit like an MCA just for the environment.

Rachel said that realistically this type of information is not feasible without a full EIS study or similar (up to 2yrs work). Any less detail wouldn't add to the information we already have. Some good general information will be found in the Stressed Rivers Report which will now be out of date. EPA also prepared an environmental value paper for this catchment.

Rob agreed that, despite being general, you won't get any better data than the stressed rivers report.

What other data is there to help us? Robyn advised that the CWG can't inform residents without the information. Approach consultation as information for the public and allow them to ask questions.

We need to provide general community awareness – Rachel recommends consultation should raise awareness leading up to providing information. Awareness first, information second.

Don said Council must keep providing updates on the process through Tweed Link. Council must continue to incorporate information into the Tweed Link. Doesn't believe community consultation will work.

Rob wants more information in the Tweed Link. Cllr Holdom asked who is reading the Tweed Link?

Everyone raised hands.

Cllr Holdom presented a question to David Oxenham – Would you tell me what the council officers are going to do with the CWG report?

Response: Two things i) give it to Council, and ii) place the report on public display

Cllr Holdom: What does Council do with the CWG report once it receives it? Council can consider the recommendations in the report.

What is the process from the CWG to Council decision?



Response: i) CWG report drafted after the last meeting and distributed to CWG for comments / acceptance. ii) The report will be sent out publically and to Council. iii) The report and any other submissions received from the broader community will be collected after the closing date and incorporated into the Multi-Criteria Analysis (MCA) by MWH. iv) The MCA report will form the basis for the final recommendations to go to Council, v) Council makes its decision.

Tony asked about public meetings.

Joanna advised the Uki forum worked well. It was a powerful way to connect with the community. Tim agreed with Joanna in saying a lot more people became more interested after the meeting at Uki. In raising awareness the forum was good, However, the forum didn't provide informed feedback.

Joanna commented – "there was informed feedback, it was the Survey!" 100 surveys went out at that meeting.

Stuart asked if broader community can get their heads around these issues to provide input?

Richard said if we were to make the public aware of a new Dam at a public meeting, there would be a huge reaction to a new dam when it surfaced at that public meeting.

Stuart summed up the objectives from the group:

- Allow us to distribute more information and improve awareness
- Enable the community to feel involved, have their say and provide input Stuart then asked the CWG the best way to achieve this.

5b. How might they best be achieved?

Tim was questioned about what was possible. He acknowledged there are limitations to Councils resources, timeframe & budgets. Tim submitted to the CWG, via email, 2 ideas to reach the broader community with information. The first was for public information sessions to be held across the Shire over three dates. These sessions would not follow a set format, a possible slideshow, CWG representatives and Council's representatives to be present. The second option was an on-line forum "Bang the table".

Pryce suggested to put information in the Tweed Link highlighting the options if community is interested to come and have a look – have a referendum - send in their reply (reply paid post) by certain date.

Don believes a Tweed Link dedicated to the issue of water supply be printed. This reaches every letterbox in the Shire. The issue would list the 4 options, if the community wants to comment, ask them to respond by comment on website or turn up to a public session.

Rob commented that the Tweed Link needs to inform the community before they can make a comment. The community needs to know where to find additional information



in relation to the options, who are the Community members & Council members they can call to ask questions etc. A three-pronged attack including internet is ideal.

Tony cited an exercise he participated in trying to get information to the public in the UK and found only a 2% response rate. He suggested an open magazine advising an exhibition date and a form was required to get filled in -not a survey. This one day exhibition received 75% response. Tony said any involvement needs to be pre-report compilation so that the information can be incorporated.

Stuart asked if CWG reps could attend one/any of these information sessions or individual meetings? Most of the CWG agreed they could attend.

Tony advised there has been a lot of criticism levelled against the CWG and believed this would be a positive step with a 3 pronged strategy approach being:

TSC Website On line forum Public information session

Anthony Burnham advised Council has a dedicated email site and a 1800 telephone line. There are already 3 or 4 methods to get feedback, but that Council was prepared to explore other avenues to provide feedback from the public.

Tim advised the dates were chosen with a broad cross section of times to have an open public information session. The tentative dates and suggested venues were: Murwillumbah Thursday 11 Feb Tweed Heads Wednesday 17 Feb Pottsville Tues 23 February

Robyn made Motion to proceed with the three information sessions.

MOVED: Robyn Lemaire SECONDED: Tony Thompson

The Motion was carried unanimously .

MOTION CARRIED

The CWG agreed that notices should be published within the Tweed Link immediately.

Tim and Anthony to discuss resources.

Rachel would like to see the Bang-the-Table method to be used as well. The more methods used, the more likely we will broaden community awareness and increase feedback.

Stuart and Tim agreed on the potential benefits of employing additional methods. Tim also noted that the CWG will also have to be aware of the different types and qualities of feedback we are likely to receive from the various consultation methods. There will be a stage where we will have to critically analyse the info received and we can all start thinking about that.





6. Next steps including pre-work for meeting 4.

Stuart requested for the next meeting if any member of the CWG or a nominated invitee would like to prepare a 5 minute presentation/report on the Implications of the Social Issues and the Impacts relevant to our Community.

This presentation is to discuss the social, commercial and community impact of these choices.

Tim to be notified no later than Thursday morning 04.02.2010 about who would like to make the presentation and dot points on the content of the presentation. Tim to provide the CWG with that information prior to confirming the agenda. Anthony noted that the presenter should be made aware that they will only present and will not sit in on the rest of the meeting.

7. GENERAL

7a. Questions

Joanna requested a CWG discussion regarding the Multi Criteria Analysis to discuss adjustments to the weighting factors. Stuart and Tim mentioned that this will start at meeting 4 and be part of meeting 5.

7b. Wrap Up

Stuart asked for one word from the CWG to sum up how we did tonight?

- *Great *Fantastic
- *Concerned *Hump (get over)

*Progress *Hopeful

*Alarmed (Mark Hunting alarmed that the Terms of Reference were shaken. That the terms were challenged puts to risk other issues like demand management running its own course. The CWG should allow Council to move on with it.)
 *Workload *Enlightening
 *Consolidate *Relieved

*Heavy

8. Next Meeting:

The next meeting of the Community Working Group will be held Monday 15 February, 2010 at 5.30pm in the Canvas & Kettle Room Meeting Room, Civic Centre, Tumbulgum Road, Murwillumbah.

9. The meeting closed at 9.25 pm

Attachment: Table 1 – What is the relative importance of these issues?

BYRRILL CREEK DAM

Less Significant	50%					Мо	re Significant
	Need best info on Enviro issues	Preserve pristine rainforest	Platypus	Loss of habitat connectivity	Land clearing	Inundates world class riverine habitat	Loss of very high quality preservation area
	Not losing remnant vegetation	Native vegetation loss	Wholesale Enviro destruction	Achaeologic al values threatened	Species eradicati on	Habitat loss Species loss	Inter- generational equity
	Downstrea m flow impacts	Impact of construction machinery				Threatened species	Affects flows of other rivers
		NP Mebbin					Protect
		400ha clear felled					Conserve
		Clearing and felling					

CLARRIE HALL DAM

Less Significant					50%						More Significant		
					Force wildlife retreat	Loss of land	Inundation of rainforest pockets (high value)	Greatest volume of water in storage supply	Clearing along edge of dam 8m	Two thirds loss of park	-water quality? -capacity? -less conservation than BC	Aboriginal Cultural sites flooded	
					Flooding of gullies		Trash what is already trashed			Habitat loss			
							Downstream flow impacts						

CALDERA ENVIRONMENT CENTRE (TSC, WAP, CWG, CEC, Statement and Proposal)

NO DAM

Tweed Shire Council 'Water Augmentation Plan' has been announced as necessary and in process. "Community consultation" has been announced around 4 shortlisted options, options which have been determined by Council, ... prior to any –"community consultation"– process. Options presented are all engineering based solutions, constructed around questionable assertions.

Shortlisted options proposed within the said plan include:

- A new dam and the flooding of the highest riparian conservation value land in Tweed Shire at Byrrill Creek;

- Increasing the height of the dam wall at Clarrie Hall Dam an additional 8 metres, flooding significant areas of farming, residential and forested land;

- Installing a pipeline to SE Queensland capable of taking water both ways, shipping water into the Caldera (from the non-sustainable desalination plants of the Gold Coast), or, shipping water out from the Caldera (to the on-going non-sustainable development of the Gold Coast).

Council have invited community consultation, though have presented the shortlisted options as the only alternatives under consideration. Significantly changing the water use practices of residents, to eliminate the need for additional water, has not been properly implemented to date.

The Caldera Environment Centre is actively opposed to all of the shortlisted options presented by Council and seek the re-opening of the shortlisted options selection process and the inclusion of a New Option: "The Wise Water Use Option" for all new mass housing developments, introducing the following requirements:

High Volume On Site Rainwater Collection and Extended Use – We seek a More Realistic Approach by the Health Department to the Regulations concerning The– Collection–and–Use–of–Rain–Water. We live in The Countryside, we drink the 'Rain–Water' here, the Rain–Water is good, we have 'Rain–Water–Tanks' which supply 'Whole–of– House–Use'. For the currently in process Mass–Housing–Developments it is illegal to build using Rainwater–Collection for Whole–of–House–Use. The new Mass Housing Developments can be re–designed to collect rainwater for Whole–of–House–Use (40,000 litre minimum storage per Household, held in common underground reservoirs).

Large Scale Grey Water Recycling on Site and Integrated Storm Water Harvesting – Dual reticulation systems are already in place elsewhere, eg in Rouse Hill, Sydney, since 2001 (57% of water used is recycled), within the WRAMS scheme for Sydney Olympic Park, and such systems are under construction at Hoxton Park and Ropes Crossing at St Marys. The NSW Govt. through the Water for Life Programme recommends that Local Council's adopt such systems for new housing developments. A Reconsideration of Option 9, the Mass Distribution of Direct Potable Recycled Water – option 9 was discounted as "unproven in Australia" – even though this method of water recycling has been in use for decades in Europe and Asia and the technology is readily available. The proposed new developments are all in close proximity to the waste water treatment plants at Banora Point and Kingscliff. The above Rainwater Collection Tanks can be used for drinking water to allay concerns about drinking recycled water.

Promotion of Composting Toilets as a legitimate alternative to water based sewage treatment – 20–40% of indoor domestic water use is flushed down the toilet. Hydraulic solutions create many problems, including: significantly increasing the volume of sewage which must be treated, and that water needs then to be filtered clean for discharge or reconsumption. Approximately half of the Council budget goes on water distribution and sewage processing and treatment. Dry composting toilets are water-free and dealt with on-site.

Proper Garden and Landscape Design – 50% of outdoor domestic water use is used to water inappropriately designed gardens and public landscapes.

Proper Urban Demand Management – including limiting the planned population increase in this area (rather than doubling the local population, as is 'currently-in-process').

We recognise the limitations of the NSW Government Planning processes place on some of the Wise Water Use components, though believe that Tweed Shire Council has the obligation to challenge and modify these restrictions, as the representative body of the Caldera residents, and serving the interests of the shires biodiversity value.

The planned mass housing developments are being designed as unsustainable.

We want the introduction of "The Wise Water Use Option": mandatory sustainable design of the proposed mass housing developments.

We don't want Byrrill Creek dammed and flooded, it is the highest riparian conservation value land in the Shire, it is irresponsible and provocative to propose the flooding of Byrrill Creek.

The above statement is the Formal Statement of the Caldera Environment Centre for submission to the Working Group for the Tweed Shire Council Water Augmentation Plan.

The Caldera Environment Centre proposes, and seeks the support of other Working Group Members for:

- 1. The reopening of the process of the selection of the shortlisted options, and
- 2. The inclusion of the Wise Water Use Option for consideration as an option, and
- 3. Community input into the process of the selection of the options to be shortlisted.

ENVIRONMENTAL EFFECTS & CONSIDERATIONS FOR THE PROPOSED BYRRILL CREEK DAM

This paper should be read in conjunction with: "An Overview of the Byrrill Creek Dam" J. Gardner

Environmental Effects of the proposed Dam

Impacts would fall into different categories:

- Construction related: Widening or damage to existing access roads & surrounding vegetation, Heavy machinery, cement works, pipes, traffic, noise, air pollution, resource use, green house gas emissions
- Dam wall Site & construction zone: Complete eradication of existing land & river features and destruction of habitat and species.
- The catchment area of 400ha would be clear felled of existing trees & vegetation up to the 125 mt contour mark to ensure water quality in catchment, again total loss of habitat & profound affect on all species
- Inundation of the area; the land lost, and all of the ecological, social, cultural, economic and climate impacts associated with this.
- Hydrological Changes: the impact of water being retained by the dam & the lack of water available to the
 natural environment downstream with changes to flow rate, frequency and duration and water quality,
 especially until levels within the dam reached spillway level. At present Byrrill Creek is rated as category U4,
 being of low environmental and hydrology stress, due largely to the low levels of water extracted from the
 creek. (Stressed Rivers Assessment Report.)
- The dam wall would be a barrier to fish, eels, platypus, turtles and other aquatic species & interrupt migration and breeding patterns
- Species that live within the riparian zone, from insects, to frogs, platypus or vegetation along creek banks, would have to adapt to new conditions, but many may not be able to.
- Erosion downstream could be exacerbated by the dam wall, as it would prevent natural migration of silt downstream during floods & heavy rains.
- The western Inundation level encroaches into Mebbin National Park, which has a high incidence of threatened species.
- Looking at the larger environmental picture of the Upper Tweed River, if a dam was built at Byrrill Creek, it would mean 2 dams in adjacent catchments on this stretch of the river, which is already rated S3: High Hydrological stress & Medium Environmental stress (Stressed Rivers Assessment Report.) The reduced flow into the upper catchment of the Tweed would further degrade the quality of an already stressed river.

The Byrrill Creek Sub catchment has been the subject of 8 Assessment Reports/ Projects

- 1. Flora & Fauna Assessment of 100ha for TSC for Reafforestation. Parker 1998
- 2. Stressed Rivers Assessment Report (August 1999) Tweed Catchment, NSW Land and Water Conservation
- 3. Environmental Assessment of Selective Harvesting for TSC Forestry Plantation. Parker 2000
- 4. Tweed Riparian Restoration Prioritisation Report (2003) Ecosure, Burleigh Heads
- 5. Tweed Shire Vegetation Management Strategy (2004)
- 6. NRCMA Byrrill Creek Riparian Rehabilitation Project 2006
- 7. PAS Key Corridoor Connections Project 2009
- 8. A local Byrrill Creek Fauna & Flora Survey J. Gardner 2009

There has been no complete Fauna & Flora Assessment of the proposed dam site. Parkers Surveys of Council owned land were of limited areas compared to the 1,0131ha owned. (No 1. was of 100 ha primarily on the southern side of Byrrill Creek road.) Less than 10% of the Council land was surveyed & the flora and fauna reports were quite specific in scope, addressing reafforestation and limited logging. Many of the Surveys above were rapid assessment style, & some are quite dated.

I suggest that there needs to be a new assessment of the entire site commissioned, ASAP, before an intelligent & informed decision could be made by the CWG or the Council about the 4 options.(see enclosed letters from R. James & Peter Parker) I understand that legally, this assessment would have to meet the NPW DECC Threatened Species Survey Guideline.

Threatened Species

The proposed dam site, encroaches on Mebbin National Park to the west, and the area north & north east are bounded by Wollumbin National Park & Mt Warning National Park, which is world Heritage status. There have been numerous assessments done in these adjoining biodiverse parks with a high percentage of recorded Endangered, Threatened or Vulnerable fauna & flora species. An assessment of priority fauna species through the PIA identified 42 priority Flora species & 37 priority fauna species(6 amphibians, 7 reptiles,13 birds,& 11 mammals) Their habitat extends beyond park boundaries along the Byrrill Creek valley which acts as a corridoor linking all the well forested ridges. Much of the ridge vegetation comprises mixed forest of Tallowoods (Koala Primary food Source) and Grey Gums, Flooded Gums, Iron barks, Blackbutts and Forest Oaks (Koala Secondary food Source). Data from Tweed Veg Mapping & the Byrrill survey indicate they are core Koala habitat areas.(40 sightings & 5 resident koalas near homes-Byrrill Survey) An intensive 4 month study of the Endangered Giant Barred frog was carried out within Mebbin. Down stream in Byrrill Creek 13 sightings have been recorded, 4 of them within the dam catchment area. These are just 2 examples of many threatened & vulnerable species that would be affected by the dam <u>which indicate a need for a detailed new Assessment of the whole dam catchment.</u>

High Conservation Status

With the exception of Parkers Assessment, which were for specific reasons, all reports classified the Byrrill Catchment area as High riparian Conservation status.

The area in the vicinity of the proposed dam is comprised of Myrtaceous Riparian Low Closed Forest to Woodland which is classified within a Rainforest category & occurs as a Riparian Community. It comprises a low closed riparian forest to woodland community found in a relatively narrow band fringing creeks or in gully sites within sclerophyll forests. Tweed Veg Management Strategy allocated it a High Conservation Status 2, as Inadequately conserved, with less than .36% conserved within the Tweed.

In the Tweed Riparian Restoration Prioritisation Report, of the 6 subcatchments of the Tweed, 86 sites were surveyed & ranked. Byrrill Creek ranked the highest Conservation Value, with an average 70% and Diversity, 79%. Within the top 30 high priority sites, 10 are in the BCk catchment. Most of these sites (except Cedar Creek sites) will be affected by the proposed dam site. Of particular concern is Site Rank 4 (BYBY2), which is within the proposed dam wall construction site & runs 300metres upstream of the dam site. Another site, (BYBY4), ranked as number 1 priority within the Tweed, is approx 800 mts downstream of the dam wall and would be severely affected by reduced water flows of the dam upstream. Further sites downstream would not be as severely affected as Cedar Creek would provide extra water flow. Be that as it may the whole riverine eco system of Byrrill Creek would be affected by the proposed dam. The dam wall site is at the northern end of a beautiful natural lagoon, where daily sightings of platypus occur.

Aboriginal Heritage Sites within the Catchment Area

There are several sites of Aboriginal Cultural significance on the Council land, which would be inundated. It is interesting to note that when "Boodjeragali', an Aboriginal Organisation, applied to Council to look for cultural artefacts on their land in 2004 they were denied access.

Toxicity within the Catchment

Dip Sites within the Catchment There are 2 abandoned Dip sites within the proposed catchment area. The Byrrill Creek Dip at the eastern end of the Council land and the Maybeirne Dip at the western end. Toxic chemicals (many banned these days) may have leached into the surrounding soil and ultimately pollute the water quality if the dam is approved. Uncle Harry Boyd was concerned about the Dips at the Uki Water Options Meeting.

Spraying of Groundsel & other weeds

For many years from 1984 council commissioned their land to be sprayed with 24D and 245T, the active constituents of Agent Orange, which would have residual effects in the soil, and affect water quality.

The Bigger Picture

The Byrrill Creek area is geologically part of the inner dyke complex of the Mt Warning Massif. As a World Heritage listed area, scenically beautiful, it comprises the southern side of Wollumbin, a spiritually significant site to the Aboriginal people and to residents who live in its shadow. Residents & tourists could no longer travel in a scenic circuit around Mt Warning as there would probably be no access. A dam would destroy the integrity of the "whole".

Joanna Gardner CWG Representative for the Byrrill Creek Area.

EMAIL 31/1/10

Peter Parker Environmental Consultants Pty Ltd Flora & Fauna Assessment on Tweed Council Land

peterp@mullum.com.au

Dear Peter

In relation to our telephone conservation 30/1. My questions were:

In relation to the 2 assessments done for TSC for their forestry plantation, the initial assessment (Dec 1998)was done for 100 ha, of the total 1331 ha property..what area of land was surveyed in the 2nd assessment for selective harvesting of logs? Were the areas along Cabbage Tree Creek , Byrrill Creek, & areas adjoining Mebbin National Park(back then State Forest) assessed? As your 2 assessments were for specific reasons (plantation & harvesting),would you consider your assessment to be comprehensive enough for a committee to make a decision whether this land is suitable to be inundated for the proposed Byrrill Creek Dam?

Our Community Working Group Meeting of the Tweed Shire Water Augmentation, (of which I am a member as the Byrrill Creek Affected Landholders) is meeting tomorrow evening on the Environmental impacts of Tweed Councils water options. My apologies for the lack of notice, but could you please email me a brief reply asap, by 11.00am tomorrow?

In the mean time I will look up DECC Threatened Species Survey Guideline 2004.

Many thanks for your time,

Joanna Gardner (CWG Rep Byrrill Creek Affected Landholders)

REPLY 31/1/10 Peter Parker

Further to your questions, my flora and fauna reports were quite specific in scope, addressed limited logging and did not include fauna trapping. They did not cover even 10% of the area under Council's ownership. Further, my studies are dated and were prepared under a different statutory regime than applies today. My studies would be useful to provide background information only.

The suitability of a site for a dam needs to cover a lot of matters including political, social and environmental considerations as well as ecologically sustainable development as defined by the EPA Act. With respect to flora and fauna studies, the general survey requirements are detailed in the DECC draft threatened species survey guideline of 2004. The extent of studies required for a 1331 ha site, particularly one such as Byrrill Creek which is well vegetated and contains threatened species habitats would be comprehensive and include systematic fauna surveys. While the property may have been purchased by Council with a specific need in mind, this does not exclude Council from undertaking a thorough flora and fauna assessment.

It may be premature to embark on a full EIS, given the expense and the number of other options being considered. However, it is customary to prepare an assessment report which addresses the matters which need to be included in an EIS. This report would include background surveys and would identify the gaps in the knowledge and relevant statutory requirements.

I hope my comments are helpful Regards Peter 1628 Reserve Creek Road CUDGERA NSW 2484

30th January 2010

Community Working Group Tweed District Long Term Water Supply - Demand Management Strategy Tweed Shire Council

Dear Members

Re; Byrrill Creek Subcatchment

The ecological significance of the Byrrill Creek subcatchment was identified in the Tweed Catchment Stressed Rivers Report (1999) as high conservation value status with low environmental stress and low hydrologic (water extraction) stress and the Riparian Restoration Prioritisation Report (2003) as the sub-catchment with the highest priority within the Upper Tweed for riparian restoration and threat abatement works.

I have worked in the Byrrill Creek subcatchment since 2005 when contracted to co-author the Byrrill Creek Riparian Rehabilitation Plan (2006) as part of the Northern Rivers Catchment Management Authority (NRCMA), Byrrill Creek Bank Stabilisation and Riparian Enhancement Planning Project. The implementation project has continued over the past five years involving sixteen private landholders and Tweed Shire Council in Byrrill and Cedar Creek. Tweed Shire Council and NRCMA have funded the restoration which has significantly reduced the threat to biodiversity by invasion from vine weeds (Cats Claw Creeper and Madeira Vine), Small-leaved Privet and other environmental weeds. In 2009 Byrrill Creek subcatchment including the upper reaches of the creek were one of the three selected Priority Implementation Areas (PIAs) in the NRCMA project to implement recovery actions for threatened species in targeted PIAs (PIA project).

The PIA project extended from the riparian focus in previous documents to the whole of the subcatchment including the national parks. The project identified threatened species and key threatening processes in the PIA. An assessment of the status of conservation-priority target vertebrate fauna species and priority flora species was undertaken for the area encompassed by the PIA sub-catchment. Desk top studies supported by limited survey identified forty-two priority flora species and thirty seven conservation-priority fauna species (6 amphibians, 7 reptiles, 13 birds and 11 mammals).

The high ecological significance of the Byrrill Creek subcatchment from the intersection with the Kyogle Road to Cabbage Tree Creek has been well documented though the main focus of survey has been concentrated on the riparian area. The PIA project included minimal field assessment of the 7468 ha subcatchment.

Additional environmental assessment is required in the upper catchment areas of the PIA including Tweed Shire Council land, private land and national parks. The assessment would provide information to build on existing studies to fully establish the ecological significance of the Byrrill Creek subcatchment and the impacts on flora and fauna that would be caused by the construction of a dam in the subcatchment.

Yours sincerely

Rhonda James Restoration ecologist



Minutes of the Water Supply Augmentation - Community Working Group Meeting held Monday 15 February 2010

Venue:

Canvas & Kettle Meeting Room, Civic Centre Tumbulgum Road, Murwillumbah

Time:

5.30pm - 9.00pm

Present:

Facilitator: Stuart Waters (Twyfords) Tim Mackney (Public Works)

Rob Learmonth (Tweed Coast); Tony Thompson (Murwillumbah); Samuel Dawson (Environment); Richard Murray (Environment); Robyn Lemaire (Water User); (part-time attendance) Colleen Edwards (Landholder: Clarrie Hall Dam Area); Joanna Gardner (Landholder: Byrrill Creek Dam Area); Joanna Gardner (Landholder: Byrrill Creek Dam Area); Don Beck (Business/Commercial); Pryce Allsop (Business/Commercial); Cllr Dot Holdom (Tweed Shire Council) David Oxenham, Michael Wraight and Anthony Burnham (TSC staff); Mark Hunting (MWH) Geraldine O'Flynn (Southern Cross University) (arrived 5.50pm) Rachel Eberhard (Tweed Heads); (arrived 6.35pm)

Guest speakers:

Jenny Pearson Malcolm Bailey Eddie Roberts Paul Hopkins

Apologies:

Cllr Phil Youngblutt (Tweed Shire Council) Jackie MacDonald (Aboriginal Advisory Committee)

Objectives:

To be a forum that will / where:

 establish and build positive relationships between the Council, key stakeholders and the broader community



- support two-way communication with key stakeholders and the broader community
- provide information to stakeholders and the broader community about the options, assessment processes and issues used to determine a preferred option
- provide feedback for stakeholders and the broader community on the options, assessment processes and issues used to determine a preferred option
- members can work together to identify environmental and community impacts of the options and to provide feedback on their prevention, minimisation and mitigation
- members can work together to identify opportunities for Council to communicate and consult with the broader community, and to provide feedback on the Council's consultation and communication plans and activities
- draft a report representing the views, interests and issues of members together with a summary of group recommendations for consideration by Council

Meeting commenced 5.40pm

1. Welcome by Stuart Waters.

Stuart reinforced to the group the goal of focusing on the social and environmental implications in relation to the 4 options.

Stuart then asked for the Group to briefly scan the minutes of the previous meeting for adoption.

Richard referred to point 29.3b in the question register regarding the capacity and depth of Clarrie Hall Dam and queried whether the conversation between Anthony and Tony after the last meeting on the topic should also be included in minutes.

Anthony responded that he is addressing this question but it will take a little more time to provide a better approximation of the proposed dam volume.

Stuart recognised the question raised was outside the meeting itself and is therefore not appropriate to be included in the minutes.

Minutes of Previous Meeting:

RESOLVED that the Minutes of the DRAFT Minutes of the Water Supply Augmentation - Community Working Group Meeting held Monday 1 February, 2010 be accepted as a true and accurate record of the proceedings of that meeting.

Moved:	Cllr. Dot Holdom
Seconded:	Rob Learmonth

Business Arising:

Joanna requested a full EIS be undertaken on council land.

Tim responded that this is outside Council's resources to undertake an EIS before the preferred option is selected. Once selected, a full EIS must and will be undertaken on that option.



Joanna added - How can CWG come up with a conclusion without all the information? Even Margaret Balandin from Water Options said there was not a full enough assessment, so there needs to be more data gathered.

Colleen requested a sectional plan be made available for what the proposed plan of the new CHD wall and slipway is to look like.

Tony asked if this group is not making a decision but only a recommendation on the preferred option – does that mean that our recommendation will not be followed?

David responded that Council will make the final decision. Council will then need to go through the entire process of an EIS and follow the relevant legislation prescribed. Therefore Council will look at the option recommended, assess all of the information and determine the path forward.

Don agreed with David. He said we have known all along that Council makes the decision. It has been discussed at each of the 3 meetings to date, is in the Terms of Reference and the 4th point in the question and answer handout to the public, headed "Who Decides?" also states that Council ultimately makes the decision – the CWG is gathering the advice.

Colleen asked how does council take the CWG's recommendations into account?

Dot responded by explaining she sees her position on the CWG chiefly as an observer to gather info and disseminate to Council – which is part of the transparency to come to a decision. She referred to the Terms of Reference No. 4: Roles and Responsibilities which states "The CWG is consultative in nature. It is not a decision making body. Decision making powers are retained by Tweed Shire Council." She does not take that decision lightly and wants to make the best decision. She will take the recommendations of the CWG back with her as part of the deliberations.

RESOLVED that the Minutes of the DRAFT Notes of the Water Supply Augmentation -Community Working Group Site Visit held Monday 1 February, 2010 be accepted as a true and accurate record of the proceedings of that site visit.

> Moved: Cllr Dot Holdom Seconded: Colleen Edwards

Business Arising:

Joanna provided late amendments to the notes on the field trip made. These will be circulated to the group



Agenda Items:

1. Overview of the process from here. A plan for the final two meetings. Stuart

Stuart talked through his powerpoint slide show (attached).

- So Far: a brief overview of what the group has achieved so far
 - Looked at Dam options in some detail
 - Identified key environmental issues
 - Provided input on the relative significance of those issues for each of the two dam options
 - Raised broader concerns for consideration and extended the ToR
- The task ahead: summary of the main steps in the process
 - Weight the criteria how important are the environmental and social criteria?
 - Rate the options how should they be rated in terms of their environmental and social impacts?
 - Provide your rationale for weightings and ratings
 - Provide advice on the important things Council needs to consider in considering water supply augmentation "caveats" to the recommendations
- Today: the focus of today's meeting
 - Social issues, what are the most important, for which option?
 - Further data on the environmental issues
 - Data on the two pipeline options
 - Review and agree on the key enviro and social 'criteria'.
 - Refresher on the multicriteria analysis tool
 - Agree on the reporting process.
- Meeting Five: what to achieve in the last meeting
 - Review what we've learned
 - As individuals and then as group, weight the enviro and social criteria. Provide rationale.
 - As individuals and then as group, rate the four options in terms of impact on their enviro and social criteria.
 - Identify key issues for consideration by Council, and provide advice.
 - Finalise messages for the report.

Discussion took place during Stuart's presentation:

Tony asked if the report is to be ignored where will it be published? Why are we here? This appears to be a total farce.

Anthony responded the report is intended to be put on public display so that the broader community can use it as another resource and take that information into account. In respect to the final multi criteria analysis, it will be an appendix within the final report that goes to council. It will not be ignored.



Tony asked what if our caveats say we don't want council's choice? If the CWG goes to council with its recommendations saying for example we want option 1 and council says option 3, then Tony objects to that. Tony stated he was appalled if that's what can happen.

Dot responded to Tony – I'm somewhere between offended and angry. Remember my question to David in the last meeting? What happens with the CWG recommendation?. The CWG is not the final decision maker - Council takes the recommendations from the CWG on board. Dot said she doesn't know what the final outcome is going to be. By asking David those questions in the last meeting – Council will consider the recommendations by the CWG within the report and through the bureaucrats who will produce a report to Council. We are all working for the one thing at the end of the day. Ideally Council needs the CWG to say this is the option it thinks is the best choice. There is a process which needs to be followed.

Stuart advised this is the opportunity for the Group to provide further input by addressing ratings, weightings and making further comment, to assist council in its decision.

Richard stated there was a key issue when talking about the environment – are we talking about natural, man-made? We need to know what you mean by environmental and social aspects.

Stuart advised that Mark will address different aspects of the environment, within his presentation later in the evening.

Colleen asked if the Councillors decide not to follow the recommendations by the CWG, does Council need to explain why? Do Councillors have to explain why they made the decision they made?

Dot explained that Councillors are given business papers and the public is entitled to a copy also. The papers are available online – and anyone is able to make further comment. The CWG report will go to the council officers and become a report that then goes to public exhibition and everyone is entitled to make a submission. She recommended the CWG Members come to community access and watch and observe the process – how Council talks about the issues.

Colleen asked is the voting anonymous? Do Councillors need to give reasons why they vote one way or the other?

Dot said that Councillors do not have to give reasons as such, however it can be seen in the debate which occurs before a resolution. Each Councillor's decision and vote is recorded publically on a screen using voting buttons. There are 7 Councillors – it is a transparent process.

Rob suggested one thing that may help the Group feel that the work being done by the Group is productive and will be heard is to make the CWG report part of the total EIS report. He suggested that if people are feeling their work is devalued, it would assist to ensure the information must be taken into account. Rob made a Motion to move:

That the record and recommendations of the CWG Group made to Council be included to form part of the EIS report.



MOVED: Rob Learmonth SECOND: Robyn Lemaire

The **motion was carried** by a strong majority.

Don stated this decision is for the future – we need to put trust into our Councillors – we have not looked at the big picture of the whole of the Tweed Shire.

Stuart then asked for Cllr Holdom to remain timekeeper for the presentations and reiterated to the presenters and all CWG Members to keep focus on key issues.

2. Presentations on social impacts and discussion:

2.1 Byrrill Creek

Joanna briefly introduced her guest speakers, Jenny Pearson & Malcolm Bailey

2.1.1. Jenny Pearson - (speaker on behalf of inundated people) All of their statements (including those not presented are attached).

Jenny's presentation focussed on the severe social effects that would be caused by the inundation of the Byrrill Creek valley. Some points included:

- Representing 14 people and can provide statements from all
- Some people not compensated due to caveats on their land regarding future dam
- Few rentals available
- Lifestyle changes
- No car if access road goes
- Peaceful environment
- Survive the valley for future generations
- Habitat destroyed
- Concerns for water quality
- Little flow downstream
- Flora and fauna
- Difficult to leave what we have built over years displacement
- Aboriginal sacred sites preserved sites
- Raised here and choose to stay
- Children to live in a beautiful environment
- Will the owner get real market value loss of rental property
- Objective to live here and be self-sufficient

Jenny expressed disappointment and anger at not being able to read out all of the statements. The people in her community had provided her with their individual statements which she wanted heard.

Richard asked to receive a copy of all presentation letters/responses.

Cllr Holdom agreed with Richard and requested copies be made available for the Group and a copy for the Councillors.



Tony said that the CWG have a lot of sympathy for what Jenny was saying – we are very supportive of your views unfortunately, we have time constraints. However please be assured that the CWG will read all of the statements and consider them as if they were presented on the night.

Stuart thanked Jenny.

2.1.2 Malcolm Bailey (impacts of living adjacent to the construction of a dam wall)

Points raised in Malcolm's presentation include (refer attachment):

- Lives 300m from proposed wall
- He and his family have lived for at Byrrill Creek for 16yrs on 5 acres
- My property is council compliant property searches when he purchased the land showed there were no constraints on the property.
- Concerned with stability of geology: Blasting the hills with dynamite vibrating rollers, shock waves, 24hr earthmoving equipments
- Direct impacts from construction noise, stress to local koala, dust, seismic monitoring for explosive, massive earthmoving equipment, reduction in animals an area described as the last remaining jewel in the Tweed Valley is at risk.
- Environmental issues
- 10 or more homes downstream along the creek affected and a hotel
- 4 houses and motel within 500m dam
- No houses within that range for CHD wall
- If dam wall was to break thru earthquake how many lost?
- Who wants to live where large scale construction is going on?
- How could I relocate?
- Where would I go?
- Who would want to rent?
- Devaluation of my property
- 2.1.3 Joanna Gardner (social impacts for Byrrill Creek & survey information)

Joanna provided statistics on the survey she had conducted and reported previously. However she concentrated on the social impacts on affected landholders. Refer to survey. She outlined following points (refer handout):

- Inundation 6 dwellings
- 2 caveats on DA's of land which would preclude compensation
- Property access and roads big issue Council has been asked where would the alternate access roads be
- Longer access road more maintenance and cost.
- Impact on privacy.
- Split the front end from backend of valley
- Access to Mebbin National Park restricted
- Cut off from community erodes social fabric of the valley
- Divisiveness within the community
- Adequate compensation real estate values being depreciated. Public works document outline Byrrill Creek dam costs. Only \$2.4m is set aside for





a relocated road and land buy backs. Peter Van Lieshout estimates his forestry plantation is worth this much alone. This can't be correct.

- Burden of caveats for future dam.
- Commercial tree plantations will be affected
- Tourism
- Aboriginal cultural heritage
- Social feeling
- Disruption of essential services

Questions:

Stuart thanked the presenters and asked the Group what did we hear from these three presentations?

Don said he would like to hear from the whole of Tweed Shire. What is best for the overall public good?

Sam said he sensed people had a strong connection living at Byrrill Creek (some for 20 & 30yrs). That caveats placed on properties would affect fair compensation.

Rob agreed with Don that the overall public good needs to be considered, but stated preserving what is at Byrrill Creek is in the public good. That the environment at Byrrill Creek should remain as it is.

Robyn asked Malcolm about the impact on property values.

Malcolm responded that he was not a professional in that field, but if he tried to sell tomorrow – who would want to buy land 300m from the dam wall?

Don reiterated that he has always said that Council must make sure fair compensation is addressed, not just the Valuer General's figure.

Colleen responded that not everything equates to a dollar value.

Malcolm said, its not a cash value – My family and I want to live there for the rest of my life.

Don said but you must have realised that the land was affected when you purchased?

Malcolm responded that his property was never affected when he bought it – it is now considered to be within the buffer to a proposed dam. Malcolm and his family are able to live off the water from his own catchment - he can't see why other residents in the Shire can't live like this also?

Pryce said the issue is about future population of the Shire. He feels for the land, the animals, and the people affected, but the issue is not whether 75,000 people are moving here but when – and with that comes how do we supply them with water.



Malcolm responded "It's in your interests Pryce, because you sell home improvements"

Pryce said I'm not saying I want a dam at Byrrill Creek, this is bigger than you or I.

Why are we looking at 36,000 MegaLitres (the larger option) when 19,000 MegaLitres is forecast for growth to 2025?

This question was referred to Question Register.

Don said we need to look at how many people are coming here.

Joanna asked if anyone watched ABC 7.30pm report? Our water supply cannot support the population predictions for Australia currently being discussed. Can we support this sort of population growth in Tweed Shire? She doesn't believe so. Has the Council considered looking at a population cap – It's not even an option.

2.2 Clarrie Hall Colleen Edwards

Points raised in Colleen's presentation include (refer attachment):

- Concern about quality of water stored.
- Still body will rise 8.5m flooded 1.2km upstream, therefore an expansion of still water Salvinia will need to be addressed and blue green algae too
- 10 properties severely impacted/land acquisition required.
- One property owner will almost certainly lose his home.
- Some properties cut into segments access in jeopardy.
- Approx 20 properties affected in various degrees.
- Zoning states land cannot be cut into less than 100 acres.
- Farmers cannot farm.
- Most farmers productive land is in the buffer zone or under water.
- Stress and anxiety for the community Will CHD be raised?
- This has impacted on every decision we have made we remain in limbo.
- Replacing McCabes bridge A bridge of approx 150m length 6m above existing bridge would need to be considered.
- If buffer zone retained at 5m fewer properties would be impacted.
- Diverse as our background's are in this community its mateship that unifies us all the valley is invited to join in and this community spirit will remain no matter what.

Questions:

Stuart thanked Colleen for her presentation and asked the Group to sum up.

Sam stated there appears to be ongoing stress and anxiety in CHD community.

Colleen responded by saying the question asked all the time "Is it going to happen or not" is constantly hanging over our head. Every decision made, like replacing a fence, the question asked is this a waste of money?

Sam also said a 7m buffer zone appears to be excessive.



Tony asked whether there is any information on the construction of the dam? We have been told the costing is approx \$30m. Wants reassurance on geology as there is concern over the stability. Building a dam is one thing, expanding is another. It could put Uki at risk.

Joanna stated that her guest speakers were very distressed at not being able to complete their presentation and proposed that any further speakers be able to deliver all information they have and cut back the CWG question time. She conveyed that her speakers were very frustrated with the 5 mins.

Don said he had received information on the time limit of the presentations and everyone was fully aware of the 5 mins & question time – it should stay the same.

Joanna said she has never seen anything as rude and ignorant as the way the three people were treated tonight.

Stuart concluded that it was not fair to the remaining speakers nor the CWG to change what had been agreed. It was a difficult situation, but there were still a number of speakers and discussions that had to occur tonight.

2.3 Environmental Issues for consideration

2.3.1. Samuel Dawson - Eco Tourism and its economic potential.

Points raised in Samuel's presentation include (refer attachment):

- Tweed tourism generated over \$330m last year & over 1600 fulltime jobs
- Tweed eco-tourism 5.8% gross product
- Downside on the Tweed is high unemployment at 42%
- Urgent need for strategies for employment growth
- Away from simple rezoning land drives and an unsustainable service based economy.
- BCD has potential as eco tourism to see this area.
- Potential to develop compatible activities eg mountain bike racing, there's great potential at Byrrill Creek.
- Emphasising eco tourism benefits in this area as it exits today.
- Crams farm excellent tourism place on weekends. If the dam is raised, 50% of this area will go under. Council needs to locate similar areas for the community to enjoy.

2.3.2 Eddie Roberts - Effects to business

Points raised in Eddie's presentation include: (refer attachment)

- Society is affected by any of these proposed developments.
- A Uki study showed that the community wants sustainable developments- to get this we need to look at demand management first. The timetable for these projects is too quick to allow demand management to take effect.
- All new developments should have 20,000L on site rainwater storage.


- If we were to do that we don't need anymore infrastructure. Dams in construction create huge greenhouse gas emissions and water quality issues.
- BCD has many values other than storing water, aside from environmental, the affect on community, on Uki and losing an economic area. Not just water for the coast.
- Say we double the size of our population in 30yrs then what do we do?
- Need to develop longterm jobs in these areas we have to develop sustainably.
- The worlds population cannot keep going now is the time to be serious sustainable development not for short term construction jobs the coast will be affected, the environment will be affected.
- 2.3.3 Paul Hopkins Broader social impacts

Points raised in Paul's presentation include: (refer attachment)

- Trained as town planner and has done some sociological training
- The process adopted by Council is not a genuine approach. You can't start with 4 options at the 11th hour
- Everything should be on the table and start from scratch.
- I found this very strange I had to sit outside. Even when you go to court you can sit in I found this very disrespectful. Felt like treated like a dog.
- Direct and indirect sociological impacts
 Direct affects on Heritage Crams Farm is known as a heritage farm relict part of our heritage. Most of that would be wiped out. How are you going to resurrect that which the community has put into it?
- Byrrill Creek has had a lot of work done on environmental rehabilitation time and money spent people have sociological attachment to this environment.
- Tourism People do go from a drive to Uki Both Uki and Tyalgum will suffer from closure of the road.
- Huge amount of money spent at Bray Park. If you have a facility that can treat additional potable water you want to treat the maximum in order to keep that investment rolling thus need to secure supply. These dams will have a lot of damaging side effects. There is no money to spend in rainwater tanks because you've spent all money on Bray Park treatment plant.
- People need to be responsible and get away from this wasteful approach to water. Paul is responsible for all his own sewage and water use.

Tony apologised to the presenters for having to wait outside.

Rob asked why have we not conducted an ESD?

Tim responded that the process of the MCA is trying to address this with the quadruple bottom line assessment of the 10 criteria.

Rob suggested that the MCA is a component of this report.



Joanna asked each of the presenters to give one issue that they believe is the most important?

- Sam the need for self reliance and independence.
- Eddie same but with + 20,000 litres for rainwater tank storage
- Paul agreed both and said that given the Federal governments generosity with rebates we should all be putting in as big a tank as possible

Tony asked what do you think is a sustainable population in the Tweed Valley?

- Eddie responded by saying I doubt it should be double what it is now
- Paul believes we have already exceeded it. You can measure it any number of ways including no parking spots, roads clogged
- Sam said this project is attempting to increase the carrying capacity of the Tweed. Why are we increasing population and eating into our environmental credits?

2.4 Population - Tony Thompson

Tony firstly read out a statement:

"We should leave our planet in a better state than when we arrived."

Points raised in Tony's presentation include: (refer attachment):

- Population statistics;
- Impacts of increased population
- Residential developments
- Policing requirements to double
- Employment
- Referred to recent article in SMH about Australia's future population"
- Cost of new developments worries him which he believes is borne by existing residents not the new ones coming in.
- Conclusion a comprehensive plan needs to be addressed.

Questions:

Don asked Tony about the reference made to SMH article. Did anyone read the article in the Daily News last week about affordable housing? Tweed has the highest priced land outside Sydney and Melbourne.

Richard informed the group that documentation about stamp duty between 2007-2009 states the number of houses halved under \$500K. So, in actual fact we are not increasing as much as we think.

Pryce provided an observation statement about population - Whilst we don't want more people coming here – it is going to be inevitable - we are going to have change – how are we going to cope with the increasing population? – this place is going to change whether we like it or not.

Tony informed the group that population control has been implemented successfully in the Lakes District in England to the benefit of the environment and existing population.



Return from Dinner Break at 7.38pm

2.5 Social and Environmental Issues for SEQ pipeline & Contingency option - Mark Hunting

SEQ Pipeline Option – slide show (attached)

- Environmental
- Greenhouse
- Social acceptability

Mark asked group to refer to notes regarding SEQ pipeline which has been assessed based on three possible alignments

- Based on info from Council's consultation with government agencies
- the third alignment through Cobaki appears to have the least issues
- NPWS identified issues for wildlife for alignments along Tugun bypass.
- The Alignment A has higher risks/problematic
- Qld Main Roads Dept has rejected any pipeline development following the Tugun bypass – they have already rejected Telstra's application for cabling.

Colleen asked what is SEQ response to a pipeline for water? Sam asked would they let out enough water for Tweed residents?

Mark confirmed the SEQ Water Grid Manager confirmed 20megaL per day is possible, however stressed that there is no confirmation that they will supply the water. SEQ is currently reviewing its own situation in the wake of the Traveston dam decision.

Richard said the closest connection to SEQ water grid is Coolangatta and that you can't connect directly to the desalination plant.

Mark advised Council had requested water from the SEQ water grid which is not necessarily water from the desalination plant but could be from anywhere on the grid (eg Hinze Dam, Tugun desal. Plant, etc).

Joanna heard there were problems with the Tugun desalination plant?

Rachel advised she had a total aversion to connect to the large grid. Whether it was from the desal plant or not, there was huge energy consumption associated with connecting.

Sam queried whether the pipeline alone could that replace a dam option? Richard asked what size pipe is required for 20 MegaLitres?

Mark confirmed that the pipeline would supply enough water to avoid the need for a dam. The pipe would be a 500mm diameter. Mark Hunting indicated a 500mm water main connection point near the Boyd Street overpass of the Tugun M1 Bypass and not at a point in the Tugun Desalination plant.



Colleen asked whether the price of water would be a set price same as that of Qld Councils and would we be contracted to a set Annual Supply whether required or not?

Mark – Yes we believe so - However contractual arrangements have not been sorted out.

Richard asked isn't the Cobaki developer going to need to provide a pipeline to supply the development anyway?

Anthony replied yes they are however the developer will only provide enough to supply that development, but will not be a large enough pipe to provide 20ML/d as required.

Tony asked how have SEQ excess water when they have been on restrictions? Mark referred to his response to the group during the first meeting where he explained that the combined capacity of the system is far greater than just the sum of the individual parts. All the data suggests there is more than adequate capacity

Rob stated that option looks like dead to him. Rob then said he believed Rous Water would look forward to a partnership with Tweed.

Response - Part of the combined option of pipeline to Rous water together with smaller pipeline to SEQ and groundwater.

Mark advised previously this combined option is a lot of money- the combined contingency option can not have any number 1's to hold it up.

After it had been stated by Mark that the pipeline to Rous would be under the middle of the road, Colleen asked what height would the pipe be above above sea level? Mark replied not much 1 or 2m. Colleen was asked why she wanted to know this; she replied that due to its closeness to the coast and that it is on sand, the effects of rising sea levels and big seas could undermine these heavy pipes.

Sam said if all developments are mostly happening on the coastal strip, these pipelines on the coast appear the better way to go to him. As far as the lesser evils go this option is better if all developments are on the coast.

Rachel asked if there is more information on groundwater resources. Is it a yield estimate?

Mark responded that we relied on the expert's report attached to the Coarse Screening Report which was yield based and that is as far as we have gone.

Richard stated SEQ is drawing 30 megaL/day from their groundwater. Mark responded that the cost of local treatment and groundwater is high. The preferred location would be upstream of the Bray Park Water Treatment Plant. The report also showed that Tweed's groundwater supplies are not able to provide the quantity of water required.

Joanna indicated that her understanding is that as far as Aboriginal cultural heritage issues go, drawing from groundwater is not good. She believes it should be weighted as no.1 – high risk.



Sam added traditional farmers indicate that groundwater use could have significant impacts on them.

Rachel would like to clarify what we are going to do for next meeting? Stuart responded that we had discussed it earlier in the evening, and would look at it again later in the evening

3. Presentation and discussion of the new matrix

Tim presented the Exel matrix designed by Council officers and MWH (including Mark Kingston) following the CWG's site visits at the last meeting (see attached).

- Two matrices one for environmental impacts and one for social impacts.
- They are split into sub criteria to give the CWG a better feel for the data.
- Discussion was based on the blank matrix to show the categories
- A matrix with all of the data will be sent to committee by end of this week.

Discussion on the sub-criteria (attributes):

Loss of threatened flora & fauna species - Joanna asked would that be 5 or 10km? Tim responded that's something we can talk about to set a parameter.

Rachel asked how do we deal with uncertainties? Tim responded it is to be reflected in comments column.

Tony asked for clarification ie Is it a loss of a number of species, is that species unique to that area, extinction?

This sub-criteria is particularly difficult to quantify given that its records are based on opportunistic sightings and reports for adjacent developments.

Richard said Aboriginal Cultural Heritage is not even mentioned.

Tim acknowledged Richard was correct. David added that Council had made a conscious decision to keep that as a separate request, the social aspects are not covered. This has come at the request of the Aboriginal Advisory Committee. Richard asked for the minutes to reflect his statement that it was not only important that the Aboriginal community present their submissions about Aboriginal Cultural Heritage but it was equally important that CWG members and Tweed residents also recognise and consider Aboriginal Cultural Heritage issues for the four bulk water supply options.

Cllr Holdom advised she sits on the Aboriginal Advisory Committee - they are not backward in coming forward. We are not aboriginal and they don't want to have us as "mission managers". They will address it in their own way.

Mark suggested Eco tourism to be included in Social matrix.

Rachel asked how is upstream and downstream defined? Tim responded that direct inundation is upstream and downstream is riparian vegetation area and changes to flow regimes.

Joanna asked to have the list of threatened species records inserted. Tim said it could be done as a 1 page attachment.



Sam would like to add environmental consciousness as a holistic entity and believes it is useful to measure because Byrrill Creek catchment has a greater environmental concern than a pipeline through a coastal area.

Richard stated he drove along Cobaki Parkway and on one side there is a proposed residential development and on the other, wetlands – where is the exact location of the proposed pipeline?

Anthony advised it would be in the road reserve.

David also added wherever a road ends up there would have already been an environmental disturbance – that is the context for the discussion of the pipeline route, that development process having already been approved.

Joanna referred to the survey and the feeling questions in regard to what Sam was saying before. Where are these values?

Rob stated the term cultural landscape is not purely just an aboriginal term. Cultural landscape is a belief system, an attachment to the land and it is a philosophy.

Tim suggested this may not be measurable as an impact under a criterion, but perhaps we can address its importance under the weightings? There is nothing to say that the CWG can not decide that 10ha at one site is more important than 100ha at another. This is up to the CWG to decide.

Stuart asked if a criterion of cultural landscape could be used to choose A from B?

Sam agreed and said it could reflect his own values.

Stuart asked to take the data that will be sent in the completed matrices and think how important this is to the community, whether high, med, low. To explore the meaning for each of these options. It is a tool to help the group understand the sub-criteria / attributes so that it can have a position on the environmental and social criteria.

Colleen asked Mark to explain what he meant on the field trip by building a wall at the upper end of Byrrill Creek? Mark said he had mentioned building a saddle dam at the top of the catchment to control a spill from the dam. Joanna asked if any costing has been done on that and Mark responded No.

Tony asked if we have any figures on fish stocks ? Tim replied that Council did not have any data and that is why the area of riparian vegetation that will be affected will be an important indicator to help assess those types of impacts also.

Stuart focus on environmental impact – can we add the following 2 to the matrix? Sedimentation Water quality



Joanna said there was nothing on the construction phase. This is a huge impact – both social and environmental. There are traffic, noise, water quality problems etc.

Anthony suggested to leave a few blank spaces to identify any extra criteria and share at the next meeting. The whole idea is to get the environmental/social issues together to decide relativity.

Rob added what about security of supply? Isn't that why we're here? Response was that this has a criteria of its own (refer Options Report).

Tim will supply the matrices with all of the available data by the end of the week and will include 2 additional blank rows at the bottom. CWG members can add additional issues that are important to you. Bring it next week.

Tony felt that this is a complete waste of time. This just goes onto a record? Have we been asked to make a decision? We've been given little guidelines. He can't see how he is supposed to supply the group with these huge amounts of information.

Joanna disagreed and said this will help us to look at the analysis with more information. Tim will supply us with the matrices with all the information contained in them. We can analyse this and compare between the options to help us make our recommendations.

Don asked where is this information coming from?

Response: from Council's data bases and GIS system. Some data is more reliable than others and will be noted in the comments column of the matrices.

4. Review of the MCA tool – review rating & weightings

Mark recapped his slideshow (attached) showing triple and quadruple bottom line criterion. We can group our 10 criteria into 4 to show the quadruple bottom line.

For rating the options, 1 is very high (degree of difficulty) and 5 is reasonably straightforward etc.

However, on the weightings it is the reverse, 1 is very low (relative level of significance). The method is rating x weighting gives the score. This is what will be done with the final analysis in the report to be presented to council.

We want to embrace the 10 criteria. The more criteria we have the greater dampening affect we have. The terms of reference for this group is to look at green (environmental) and blue (social) but in determining the final MCA, Mark will also be looking at red (economic) and yellow (governance) to determine a preferred option.

Richard Murray expressed the viewpoint that members of the CWG could be confused in any questionnaire that used ratings and weightings. A number 1 in ratings question is the exact opposite value in a weightings question.



Tony expressed his concern at the multiplication effect – it is a subjective number. Mark responded it amplifies the difference between one to the other.

5. The report – discussion on how this might work, roles and responsibilities

Stuart stated the job of this group is to create a draft report.

Stuart outlined the approach for the report:

- The ratings and weightings numbers will form the key output
- This will satisfy many of the aims from the original Terms of Reference.
- Also included will be any additional advice, issues raised, key points raised, and caveats.

Richard asked Tim to prepare a template for a Draft Final Report to expedite the completion of a Final Report,

Rachel outlined a list of prompts she has drafted to structure these comments ie assumptions, process, MCA.

Anthony agreed with Rachel's prompts.

Tim presented a broad outline for the report's main headings:

- Introduction
- Process followed
- CWG Recommendations
- Additional Issues

Tony suggested we submit our caveats before the next meeting.

Richard suggested Stuart begin with an outline or skeleton of the report and let the Group add comment to it. If you set out the report and let the Group add comments, we can save a lot of time.

Stuart advised Rachel has got the beginnings of a structure and then asked "How do we come to a consensus as a group?"

Rob asked is it a consensus process, democratic decision making - how?

Tony asked when do our codicils come into it?

Stuart advised we are going to have a discussion on how to reach that point. He suggests a big long list of issues is produced where the members can list the issues that interest us. Then through consensus we select a top 5 for the core of the report.

Joanna said if charts like the MCA Analysis were produced as a result, it will be difficult for the general community to understand. How do we help the community understand these issues? Joanna believes there needs to be a written accompaniment for a member of the general public to understand.



Rachel suggested maybe a one page summary with attachments to refer for more detailed information.

Stuart said that in his experience what has worked well previously is:

- a single page summary
- a 5 page summary report
- the report with all attachments

Pryce pointed to the chart and said once we have submitted our answers – it will give Council an idea where we are coming from.

Tim suggested to the Group, the more common ground we can find, the more power in the report. It sends a powerful a message. However any focussed information that can be provided is step in the right direction.

Richard said we had to consider 3 options – I thought there was also the 4th – it is not in the schedule.

Mark said we can't apply the MCA to the contingency option. It is something different from the 3 options.

Anthony added we would appreciate any environmental and social insight into this. The numbers are about 3 options and we need to be clear about ratings and weightings.

6. Homework – Review all the social and environmental impacts. Come ready to discuss these and weight and rate the options. Think about the key messages for Council

Stuart requested the Group to take the matrix when Tim sends it to them and look at the data – look at all options whether they have a high or low impact.

Rachel outlined her structure/format which will include :

Assumptions: Comment on population growth and water usage

Process: Comment on Council's attempt at the community engagement process ie from 12 options to 4 to 1 option; The time allocated and time in this group; Future process from here

MCA: Comment on overall criteria and weightings, ratings x 3 options, comments on 4th option, evidence based, additional issues and process going forward.

Tony agreed that he could find a place for his caveats in that type of breakdown.

Stuart advised the Group it is Tim's role to produce the final report. It would be beneficial to start a discussion about wording around the points above.

Colleen asked why we are looking at both the smaller and larger options for Byrrill Creek Dams?

Tim responded that the smaller dam is big enough for the planning period to 2036 after that its whether the second size dam provides economies of scale from an economic viewpoint, ie do we do one big dam once or go a smaller dam and potentially raise it later?



Tony definitely wants an answer to the volume/capacity of CHD in order to make a decision. Anthony replied he is hopeful to provide Tony with the method described by end of week.

Don asked exactly what would happen if council decide to do nothing and not go with any of the options?

Anthony responded with the current amount of zoned land (TSC LEP2000), it can yield the population figures that we have been talking about and unless that changes, we will be dealing with population of that quantum, at some stage in the future. If Council does nothing then there will not be enough water.

Joanna stated we have a dam costing \$58m - the State coffers are empty – where is the money coming from to build this dam?

David replied all projects are funded by TSC and contributions made by developers.

Rachel will forward an issues list to Tim.

Tim will circulate to the Group and request all contributions to be received by him no later than Monday morning 22 February.

General Business:

Stuart asked for one word to sum up the evening:

MarkHarder push on the quantifier matrixDon:Contribution made by speakers, added nothing to what we already knoTim:ProgressRob:ProgressRichard :Skeleton plans ready for next weekTony:Pleased by Rachel's issues listDavid:BetterPryce:ProgressingDot:Remains hopefulSam:Coalescence of ideasAnthony:ProgressJoanna:Emotionally disturbed by tonightColleen:Extremely enlighteningRachel:Frightened when I came in -less frightened nowStuart:Progress	Mark Don: Tim: Rob: Richard : Tony: David: Pryce: Dot: Sam: Anthony: Joanna: Colleen: Rachel: Stuart:
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Next Meeting:

The next meeting of the Water Supply Augmentation - Community Working Group Meeting will be held Monday 1 March 2010 at 5.30pm at the Canvas and Kettle Room, Civic Centre, Murwillumbah.

The meeting closed at 9.55pm.

So Far...

- Looked at Dam options in some detail
- Identified key environmental issues
- Provided input on the relative significance of those issues for each of the two dam options
- Raised broader concerns for consideration and extended the ToR

The task ahead...

- Weight the criteria how important are the environmental and social criteria relative to the other criteria?
- Rate the options how should they be rated in terms of their environmental and social impacts?
- Provide your rationale for weightings and ratings
- Provide advice on the important things Council needs to consider in considering water supply augmentation – "caveats" to the recommendations

Today...

- Social issues, what are the most important, for which option?
- Further data on the environmental issues
- Data on the two pipeline options
- Review and agree on the key enviro and social 'criteria'.
- Refresher on the multicriteria analysis tool
- Agree on the reporting process.

Meeting five

- Review what we've learned
- As individuals and then as group, weight the enviro and social criteria. Provide rationale.
- As individuals and then as group, rate the four options in terms of impact on their enviro and social criteria.
- Identify key issues for consideration by Council, and provide advice.
- Finalise messages for the report.

"SOCIAL EFFECTS ON FAMILIES INUNDATED BY PROPOSED BYRRILL CREEK DAM" PRESENTED BY JENNY PEARSON for the CWG Meeting 15th February

Good Evening. I am here to represent 14 people (including myself, my son and daughter) who will lose their homes, gardens, & orchards by the flooding of our incredibly precious Byrrill Creek. Some of these people would not be compensated due to caveats placed on their land.

I shall read you their statements regarding the social impacts on their lives:

First Byrrill Creek Resident

- 1) If the dam comes I will be made homeless, as there are few rental places in Byrrill Creek and rentals further afield are above my means, as I am on a Disability Pension.
- 2) I will be forced away from my support group, as I have no family and I regard Byrrill Creek friends as my family.
- 3) I have no car and rely on my friends for lifts to town.
- 4) I require the peaceful environment here for my wellbeing & I find urban living very stressful.
- 5) I wish this beautiful valley and river system to be saved for future generations.
- 6) I have serious concerns for the holocaust brought onto the native animals, particularly the endangered species of which I have had many sightings. Those that are fast enough can move to higher ground, the ground dwellers will be bulldozed. All the habitat, food trees and boundary trees for koalas will be destroyed; forcing those that can hop, fly or crawl into other animal's habitats, causing food and homes to be limited and animals to be stressed.
- 7) I have concerns for the water quality if the dam is built. What would be left of the creek, and how little flow may be allocated (the Doon Doon Creek below the Clarrie Hall Dam wall for example, is a trickle.
- 8) I am very concerned for the future of aquatic species, such as the platypus in every water hole, cormorants, crayfish, fresh water mussels (indicators of excellent water quality). The dam's release is sporadic and if released from the bottom of the wall, freezing cold and contaminated by sulphur; these releases come in surges, and the animals can't adapt.

Second Byrrill Creek Family

My reasons for not wanting the proposed dam are:

1) It is difficult to leave a house and home which we built with love over ten years including establishing a lovely garden.

2) It is difficult to leave the environment and wildlife we love, including platypus in our creek, ducks, water lizards, birdlife, and we have resident koalas here too.

3) A dam means displacement to all these creatures and the platypus will not survive.

4) Having to go and leave all this is heartbreaking and adds more stress to an already existing health condition.

Third Byrrill Creek Family

The reasons we are opposed to the Byrrill Creek Dam:

• Aboriginals were here before all of us, and they have some sacred sites around Byrrill Creek. Don't they have the right to have some of that land preserved for them and their ancestors?

- The government apologizes every year, but is it alright to destroy the few sacred things they have left?
- Emotionally this will affect us, as one of us was raised out here, born 29 years ago, and there is a lot of history in this valley for him.
- If the valley is flooded, depression and anxiety will be a big issue, as we will never be able to find something as special as this.
- The reason for moving back here was so our children could grow up in a beautiful environment, and we would be able to teach them about nature, and how important it is to look after what little bit we have left.
- We have resident families of wallabies, snakes, turkeys, & black cockatoos & where will they go?

Fourth Byrrill Creek Land owner

Reasons I oppose the Byrrill Creek Dam:

- This area is exquisite countryside.
- It would be brutal interference of something special and sacred.
- I can't believe it could be considered, it would be so depressing.
- I could see every kind of animal and bird from my back verandah. There are black cockatoos, (flocks of 30), kingfishers, turtles, platypus and koalas.
- I also rely on the continual income of my rental, which will be taken away from me.
- Will I get real market value for my house and 3 acres?
- I hope to God it never happens!

Fifth Byrrill Creek Family

- I have affordable rent in this house and would find it very difficult to find accommodation at this price anywhere else.
- I love the guite environment and still see all the native animals that have been mentioned above.
- It will destroy the local community, as I have had experience of dam's effects in Queensland.

Sixth Byrrill Creek Family

- I have owned property at Byrrill Creek for 30 years & have lived in my house for 23 years.
- I am a sole parent of 2 children and work part time.
- I am a Horticulturalist/bushland regenerator and have been the Byrrill Creek and Cedar Creek Landcare Co-ordinator for 20 years, & also co-ordinated Uki River Landcare group for 10 years.
- I supervised many tree plantings and regeneration projects in the shire as a LEAP and GREENCORP team leader. I am currently self-employed as a contractor, to maintain a section of Byrrill Creek for the Byrrill Creek Riparian Restoration Project.
- I am qualified to say that we have a very significant plant community here, in very good condition, which acts as a corridor between World Heritage National Parks.

- I would lose my home and all its infrastructure & surrounding gardens & would not be compensated.
- I would have to relocate and clear valuable forest to rebuild, which would be very expensive, environmentally unfriendly & a daunting task.
- I would have to pay for telephone, power & water relocation.
- Power would have to be a stand alone solar system, costing me approx \$17,000.
- I have a lot to lose; my home, my lifestyle, my security and another lifetime of work in rebuilding, (I am 50 years old now).
- I would need to rent a place, whilst rebuilding, which is very expensive (min \$300 a week)
- Replanting would be another task (I have planted extensive ornamental and organic vegetable garden as well as orchard (more than 50 fruit trees).
- The animals and plants are dearer to me than my home. They cannot speak here about their loss of homes, food, family and friends. They are not counted and are expendable.
- In my house and garden over the year I have echidnas, many families of skinks & lizards, micro bats & fruit bats, many carpet snakes & night tigers, koalas, a quoll in my chook pen, goannas, swamp wallabies, green tree frogs & many other frogs, and hundreds of different birds including last year a baby paradise rifle bird. PLEASE SAVE US!!!
- I already suffer from depression and couldn't live here to watch the destruction. I don't know what I am going to do
- Much worse is the whole idea of flooding this valley to provide urban water waste at 200-300 litres per person, when we live on tanks & use 1/4 that amount ourselves.

Seventh Byrrill Creek Resident

This is an elderly lady who is one of the very long term residents in Byrrill Creek. A caveat was placed on her land in 1982, and Tweed Shire Council have been trying to get her to sell her land. If they force her to move, it would be detrimental to her health. She does not want to move and wants to spend the rest of her life in her home.

- I have lived here for 53 years, I am nearly 90 years old and live on my own.
- I need to ask you: 'What do I need to do to stop the dam?
- I don't wish to see the dam spoil this valley and don't want it to happen.
- Tell the people to carry water by the bucket full to the house, then they won't use hundreds of litres every day.
- Tell people to cut their water use and bring less people to our area.
- Why should I have to go after 53 years. I've always kept to my own business.
- <u>'This is my business! So they can drown me. I'm not going!'</u>

SOCIAL IMPACTS OF LIVING UNDER A CONSTRUCTION DAM WALL SITE AT BYRRILL CREEK. Malcolm Bailey Presentation for the CWG Meeting February 15th

Dear Friends

This evening I am here to speak to you about the social issues attached to the construction of a dam in Byrrill Creek. I have lived at Byrrill Creek for almost 16yrs and own a small 5 acre parcel of land with a 3bedroom timber dwelling, which is fully council compliant.

Searches necessary when I purchased the house and land revealed – No requirements from any source and I also received a certificate of non action from Council.

I live approx 250-300m from the proposed dam wall. I live approx 40mtrs from the roadway known as Byrrill Creek Road, on which construction and maintenance traffic of the proposed dam will be used.

At present road maintenance especially the vibrating roller use, shakes the foundations, walls, windows and even the plates on the shelves.

Located under the soil in this area is a base of rock which also forms the plug of a now extinct volcano. Large disturbances to the stability of this rock base are at present unknown. For example, the war in the hills of Afghanistan and bunker busting bombs in the mountain ranges have resulted, I believe, in massive earthquakes in adjoining countries which caused the death of hundreds of lives. Blasting the hills with dynamite and the removal of vegetation, resulting in destruction of habitat for endangered animals and combined deep scaring of the earth's fragile surface may have catastrophic affects for many.

Direct impacts from Construction

Noise from this possible 24hrs per day operation will cause shock waves stressing not only residents within the area, but will cause stress to the local koala community which results in stress induced Chlamydia which is known to kill koalas. Noise, dust heavy machinery and construction vehicles are undoubtedly just one problem to be considered.

What about seismic monitoring and proper monitoring of private dwellings for damage from these explosions, is this without consideration?

Not to mention the massive earthmoving equipment required to be possibly used 24hrs per day.

Destruction of the aforementioned habitat where many endangered animals reside and successfully now breed, will result in a reduction of animals which now exist and which visit my home and land on which I have created an environment suitable to them and my family.

As a former property enquiries officer for the Qld Main Roads South Coast Hinterland District, it took me many years to find an area of such beauty where I assure you thousands of the said "tree changers" would live if able to.

An area described by Council staff just the other day as "the last remaining jewel in the crown of Tweed Shires past example of a pristine environment. Why be forced to leave a home where I have raised a successful family, a home approved by Council and a garden built with love, where animals are named and habitats created so we can see them without having to travel great distances and to pay for the privilege.

I remind you all; not only my house will be affected by noise, dust and construction vehicles on the Clarrie Hall Dam Road.

On Byrrill Creek Road, there are approximately 10 or more homes and a motel which will be affected by the increase in traffic on Byrrill Creek Road – 4 houses and a motel are located within 500 metres of the proposed dam wall. No houses are located within 500 metres of the raising of the Clarrie Hall Dam.

Who knows what the future may bring in today's multi cultural society. May I remind you of World War 2 and the Dam Busters or possibly terrorism events all of which we have avoided at this time. If the dam wall was to break through any of these events, possibly even earthquakes or some other unforseen events, how many will be affected?

Relocation

Who would want to live there during construction of this proposed dam? Possibly 24 hrs per day construction, a concrete manufacturing plant, chainsaws ripping the guts out of a known koala habitat and environmentally sensitive areas, heavy machinery operating which includes scrapers, dozers and the like with dust choking the already endangered habitats and surrounding environments. How could I even relocate during the construction phase, there would be tax implications. If I could find a suitable tenant who could put up with such a change to the area.

And then where would I go? I moved to this area to improve my family's health, it has improved greatly since such a move here but what possible complications will arise from such a move away? The stress that has arisen since "that" letter in the mail is to say, sickening!

Devaluation of my property

Before the announcement of such a dam buffer zone had a before price, i.e. a price of a desired piece of 'tree change" land.

If for some reason my life was to change for an unexpected life event, i.e. hospitalisation of a family member and I was required to sell to pay for an operation or to obtain treatment. I would have a greatly reduced price on offer due to this blanket thrown over the area.

As I mentioned, I worked in the Main Roads for 18yrs and I am very familiar with the market price available before a freeway and the price offered for the resumption after the freeway's resumption of land.

The price differs greatly?

Other social impacts

Council has now opted for a gate on the road to the Clarrie Hall Dam, closing access to the area, after certain hours, to restrict problems that occurred at such an isolated

location. From my recent memory of living in this area, a young man was found dead in the public toilets from a drug overdose.

After the proposed Byrrill Creek dam is constructed, campers, wild parties, meeting places for bikies or gangs and hooning may be situated near where I live, similar to the Clarrie Hall site.

Strangers entering the area with an opportunity to stay on the pretext of visiting the dam will possibly increase crime in an area which does not have any, that I am aware of at present.

Then, if Council was to consider all previous anti-social behaviour problems with the existing Clarrie Hall Dam and places a gate restriction, there will be problems with restricted access for those family and friends who wish to leave or visit my property.

Why spend an expected \$58million plus on the construction of a new dam when the state and federal governments are now running the biggest record deficits in all Australian History? Should not the money be better spent on education and health?

There are wildlife impacts and water quality issues with changes to the flood frequency and water flows. Stress related impacts to Koalas from the explosion shock waves, noise from blasting which will induce Chlamydia, a known killer of the koala population in south east qld.

Why should people who choose to live a cheaper lifestyle, who catch their own rainwater, and successfully live with this catchment, having all the latest modern conveniences, have to pay by the loss of their home and amenity? To pay for construction of new urban communities, who are wasteful with the use of this water?

Why spend a reported \$58m or more to construct this new dam that may have funding blowouts like the raising of the Russell Hinze Dam behind the Gold Coast.? Both the state and federal governments are in charge of massive deficits in their budgets, the greatest in all history.

This money should be spent on education and health to improve the lives of all and not just some. What kind of "great big new tax" will be required to fund such a record deficit and such a waste of money on a new dam with damage to the environment also!

SOCIAL EFFECTS OF THE PROPOSED DAM AT BYRRILL CREEK

PI ease Note: This Paper should be read in conjunction with complete Results of the Community Water Survey including comments. However the rest of this paper relates to Byrrill Creek only

INUNDATION:

6 dwellings will be inundated, & 15 residents will need to relocate. 2 families will not be compensated due to caveats placed on the original DA's of the land.

Water Survey Results: Quest 12; 22% own land directly affected by dam Options: 18.9% Byrrill creek, 3.14% Clarrie Hall. Quest 11: Tenants on land directly affected by dam =11.3% Farming Lease=2.5% Quest 14:How much of property do you lose: All=3.77%, 1/2=62%, ¼=12.57%, Less=10.69% Quest 24: Will buildings need to be relocated: Yes=7.54% Comment: Dismantling & relocating is not possible. Too labour intensive & costly

PROPERTY ACCESS ROADS:

A further 19 people will lose their road access to their property. Road access has been a big social impact issue here. Although Council has been asked on a number of occasions, where would alternate access roads be located, there has been no reply. Concern of 2 residents is that alternate access routes would not be via Byrrill Creek, but possibly Kyogle Rd & Tyalgum, I resident is concerned that a longer access road will be more maintenance & cost. (*See attached letter R. Hoopman*) I other resident is concerned that an alternative route for 16 + families would run close to his house, impacting on his privacy. *Survey: Quest 21: Service Access roads within property affected:* Yes=14.46% Major changes=6.28%

BYRRILL CREEK ROAD ACCESS:

The proposed dam would cut the front end of the valley from the back end, if the road was not replaced. (High costs, difficult terrain & environmental impacts may eliminate a proposed replacement road). At the Mebbin end of Byrrill Creek Road, Palm View Hamlet is located, with 29 shares & another 4 neighbouring properties. A few families there, have children who attend Aetomah School, situated on Kyogle Rd, & they use the road on a daily basis for school runs during the week. *(See attached letter G. Grayson)*People further afield towards Tyalgum would also be affected. Access to Mebbin National Park & routes via Mebbin & Cadell Rd would also be inundated.

Survey: Quest 20: Public access roads affected: Yes=25.78% Comments: 3 felt that after construction the road will be better 2 felt environmental impact was an issue.

COMMUNITY & SOCIAL COHESION

Many residents feel the proposed dam will cut them off from the Byrrill Creek community, which erodes the social fabric of the valley as a whole. From Survey results & interviews, 3 residents & 2 businesses support the concept of a dam, but the majority who returned their surveys did not. This adds a sense of divisiveness within the community.

2 residents point out the lack of privacy after the proposed dam is finished ie vandalism, hooning, parties, which is what happened at Clarrie Hall, which in the end was resolved by locked gates in the evening, which could restrict access for locals.

ADEQUATE COMPENSATION

There are concerns by some residents of adequate compensation, as many Clarrie Hall residents did not feel adequately reimbursed at the time of their buy backs. These concerns are about real estate values of homes being depreciated due to the dam, the value of the land inundated, and access roads. It is interesting to note that in the Public Works Document, of the total Dam Cost estimate of \$58 million, that only \$2.4 mill is set aside for land purchase and the reconstruction of Byrrill Creek Rd. Peter Van Lieshout calculates his Forestry Plantation is approx worth this alone! (*See attached statement*) I wonder where

these figures were derived from? On top of all this, many have felt the burden of caveats placed on their land years ago for a future dam in the 2025 which places the land & its use in limbo.

DISRUPTION OF ESSENTIAL SERVICES

As well as road disruptions to residents, essential services such as Electricity & Phone would be disrupted, during relocation of these services. Residents who use Byrrill Creek as a water supply may encounter difficulties with water supply after the dam wall is built.

Survey: Quest 22 & 23: Telephone relocated: Yes= 11.32% Electricity:7.54 % Interesting to note that in Comments 5 people indicated they were on Solar or stand alone systems.

COMMERCIAL ENTERPRISES: FORESTRY & TOURISM

Within the Byrrill Area, as compared with Clarrie Hall, farmers are not affected, except for some cattle adgistment on the Council Land. However commercial Tree Plantations on Council land and Peter Van Lieshout's land would be affected. Most of the trees will not meet maturity until 2020-2025.Peter Van Lieshout has 100 HA under a joint forestry agreements & approx 200ha contract with a private company, FEA, who lease his land, which provides an annual income.(*See Attached statement*)Investors would expect their promised returns.

Tourism:

Both Peter Van Lieshout & the Ridgeways, are involved in tourism. The latter owns the Mount Warning Forest Hideaway Motel, & the former runs Youth Camping Holidays, with 200 school children attending per week. Peter Van Lieshout considers the proposed dam would be an asset to his business, & would like free access to it for water based activities. Peter Ridgeway considers that during the construction phase there would be a downturn in business, but afterwards, it would enhance tourism.

(See Attached Letters)

On a broader scale, an employee at the Heritage Rainforest Centre in Murwillumbah, has said that many tourists request what could they do to see an overall view of Mt. Warning, and the Tourist ring route through Uki, Byrrill Creek to Tyalgum, then via Eungella to Murwillumbah is a favourite recommendation by workers there.

Beyond commercial businesses, many residents have spent years establishing gardens & orchards, around their homes that would be lost.

Survey: NB Mainly Clarrie Hall Replies

Quest 15: How much of your affected land is productive farmland? All=18.86%, 1/4=3.77%, Less=9.43% Quest 16: Which type of Farming activity is affected? livestock=25.15%, small crops=62.89%, orchards=3.14%

Quest 17: Is Tourism affected on your property?Yes=3.14% Comment: Bed & Breakfast would be affected

PROPOSED DAM CONSTRUCTION SITE

During the construction period there would be huge impacts on residents, particularly those living in close proximity to the site. Impacts would include Blasting, Drilling & Machinery noise & vibrations, presumably night construction, as was the case with Clarrie Hall, Bulldozers & heavy machinery & trucks using Byrrill creek Rd. This is a narrow winding road, in some parts one way, which would create road closures & traffic delays. There is also the safety issues with wide trucks, & particularly at School Bus times, with children in close proximity to the road. Most residents who live close by will be forced to relocate until completion, many are on low incomes & could not afford current rental prices. There is a dire lack of rentals in the Uki area & construction workers would want this accommodation as well. The later bulldozing of 400 ha of land, much with high conservation values would be heart rending to many residents, & many comments in Surveys & interviews reflected the environmental destruction as being of overall importance to them. *Survey: Please refer to entire Question 25 & comments.*

Comments Further afield: in Uki & a Kyogle road user felt the extra construction traffic would be an impact. Quest 18: Is wildlife habitat affected on your property: Yes=22.64% : Koalas, wallabies & platypus = 18.5% approx. Please refer to comments

ABORIGINAL CULTURAL HERITAGE:

There are several sites of Aboriginal Cultural significance on the Council land, which would be inundated. It has been passed on to me that there are possibly 3 burial sites, a birthing site and a camp site,& various tool sites, which would be a serious cultural & social impact on the local aboriginal community.

SOCIAL FEELINGS

Many of the residents living here have lived here quite long term, and feel a strong connection to the land here and the community in which they live. Please refer to "SOCIAL EFFECTS ON FAMILIES INUNDATED BY PROPOSED BYRRILL CREEK DAM" Presented by Jenny Pearson at the CWG Meeting 15th February. Others have the attitude "well its not in my backyard", or have expressed little interest in the matter. A few support the concept of a dam here. It is hard to get feedback & the anonymous Survey was most helpful. In the Survey there were a few in depth questions & lots of comments on how the Councils Water Option proposals affected people's feelings. These included feelings about loss of habitat, people's homes, anxiety about the future, divisions within the community,& closer to the dam site locations,: uncertainty for land use planning and property values. The answers were graded in 5 categories according to importance. Note that people beyond affected landholders answered these questions.

Please refer to Complete Question 26 & comments. Of most concern were:

Permanent loss of Wildlife Habitat rated highest: Very Concerned=52.8%

People displaced from homes: Very Concerned=46.5%

Divisions within the community: Very Concerned=43.3%

A Question from Alan, a Byrrill Creek Resident to the Tweed Shire Council

With all due respect to all traditional owners. Regarding Spiritual connection to land, why is it assumed that only Aboriginal people, with a provable connection to land have credibility? Many non indigenous people in this area have a deep connection of a spiritual nature to this land. Where is this connection being acknowledged, especially in regard to Byrrill Creek, just below Wollumbin?

Compiled by Joanna Gardner (Byrrill Creek CWG Representative)

PLEASE SEE ATTACHED APPENDIXES:

1."SOCIAL EFFECTS ON FAMILIES INUNDATED BY PROPOSED BYRRILL CREEK DAM" Presented by Jenny Pearson at the CWG Meeting 15th February.

2. " EFFECT OF LIVING BELOW A DAM WALL CONSTRUCTION SITE " Presented by Malcom Bailey at the CWG Meeting 15th February.

3. LETTERS ON SOCIAL IMPACTS FROM: Robyn Hoopman & Andy McInerny Grayson Gerrard and John Dawson of Palmview Hamlet

4. LETTER & STATEMENT ON SOCIAL IMPACTS ON BUSINESSES: Peter & Maxine Ridgeway, Mt Warning Forest Hideaway Peter Van Lieshout.

APPENDIX: SOCIAL IMPACTS LETTERS

Robyn Hoopmann & Andy McInerny Tallowood 665 Byrrill Creek Rd Phone:02 66797017

QUERIES & OBJECTIONS REGARDING THE PROPOSED BYRRILL CREEK DAM

- 1. Would our relocated access be into Byrrill Creek, or Kyogle Road? Would our road be longer? If so, how would financial considerations be dealt with? A longer driveway would need more money spent on it over time. Unless compensation covers bitumening, we would be losing financially.
- 2. If our alternative access was not into Byrrill Creek, we would lose contact with our friends, & no longer be a part of the community here
- 3. Approximately one third of our land would be inundated. Would due recompense be fair & reflect the current market prices, rather than devalued because of the dam?
- 4. The loss of the environment around us is an important issue: Byrrill Creek is spectacularly beautiful and widely diverse in its native flora & fauna. We have resident Koalas here. We would feel this deeply in many ways, including utter disgust at the desecration of a dam.
- 5. Construction: Noise, destruction and devastation for how many years. We have heard many stories of the "yobbo" factor whilst the Clarrie Hall dam was being built
- 6. Our privacy is an important aspect of our life here, which we would lose during the construction phase and afterwards, as the dam would become a recreational area.

PALMVIEW HAMLET Grayson Gerrard and John Dawson Lot 25, Palmview Hamlet 1283 Byrrill Creek Road, Brays Creek

I am writing to you about the impact that the proposed Byrrill Creek dam would have on us. We live at Palmview Hamlet, 1283 Byrrill Creek Road. The proposed dam would severely affect our present access roads to Uki, Lismore, Nimbin, Kyogle and other areas. Our access to friends, schools, workplaces, stores, and amenities would be drastically affected.

There are twenty-nine lots here on Palmview, and I imagine that most of our neighbours would be affected in exactly the same ways.

Further, our bushfire escape routes would also be limited to the Tyalgum road, which, in the case of a fire, all the cars in the area would be using and congesting.

In addition to the very negative social effects a dam would have on us, it would have tragic effects on wildlife. Much of it would be drowned, and all the survivors would be forced into territory already occupied by others and be driven off and likely die of starvation. For us, the terrible effects on wildlife are just as important as the effects on ourselves.

We would be grateful if you could pass these views onto the relevant planning authorities.

With thanks, Grayson Gerrard and John Dawson

APPENDIX: COMMERCIAL IMPACTS : STATEMENT & LETTER

PETER VAN LIESHOUT 2888 Kyogle Rd. Kunghur.

Approximately ¼ to 1/3 of my land is affected by the proposed dam. 4 to 5 years ago I cleared some of my land for a commercial forestry plantation. 100 hectares was planted as a joint project with the State Forestry, & a further 200 hectares were leased for 20 years to a private Tasmanian forestry company, FEA. I receive an annual income of \$30,000-\$40,000 from this lease. 90% of this commercial plantation venture would be inundated before reaching maturity in approximately 2025 if the dam went ahead. I would lose this income and Investors would expect their promised final returns. The compensation for this would likely be more than \$2.5 million.

My land is also used for Educational Outdoor Youth camps for school groups & up to 200 children a week may attend. At present the groups use Clarrie Hall Dam for water activities, as well as my own large dams, so the proposed dam would be of benefit to this business. I would like easy open access to the dam for these activities.

Two existing large dams that I use at present would be inundated, & they were back up water supplies for Nightcap Village, so I would want to ensure water rights on the creeks, such as Kunghurloo, prior to them feeding into the Byrrill Creek Dam.

As my land was cleared recently it will not be a big impact on wildlife, and from my observations of wild life around my existing dams, the proposed dam will help increase wildlife.

My feelings about the proposed dam are fairly neutral, however if it does not go ahead, I dislike the caveats placed on my land & find the feeling of being in limbo about it all, for future land use planning, is difficult.

Peter & Maxine Ridgway Mt Warning Forest Hideaway 460 Byrrill Creek Road Uki NSW 2484 t: (02) 66 797 277

Dear Joanna,

Further to our telephone conversation please find below a statement from me.

It is very difficult at this stage to predict how the dam will affect our business.

During the construction period the 'tourism' aspect of our business will be drastically affected. If we are able to 'pick up' accommodation from those working on the construction of the dam, then this will of course benefit our business.

After the dam has been constructed, if there are access facilities to the water from the head of the dam, this will obviously benefit our business in the form of leisure facilities that the dam can offer our guests.

Overall the dam's location and size would have no direct impact on Mt Warning Forest Hideaway.

Regards,

Peter Ridgeway

2010 02 15 IMPACTS ON THE COMMUNITY OF CLARRIE HALL DAM

SOCIAL, COMMERCIAL AND CULTURAL..... Colleen Edwards

Quality of water stored in dam:

The still body of water held in the Clarrie Hall Dam will rise by 8.5m, so where we now have fresh flowing creeks, the area will be flooded up the valley approximately a further 1.2kms infiltrating the many gullies that make this region such a diverse habitat for various wildlife and flora.

Our backyard of interesting walking tracks, creek beds, petrified trees, thunder eggs, and easy access to neighbours will be gone. In its place will be an expanse of still water, dotted with lilies and frequented by various birdlife. Hopefully, the problem of salvinia will be properly addressed and the threat of blue/green algae won't cause too many problems.

Land acquisition and fair compensation

Ten properties will be severely impacted, one home totally, he will have to sell and relocate. Some properties will be cut into segments and accesses are in jeopardy, but hopefully a suitable outcome can be resolved. Approximately 20 properties will be affected to varying degrees, either by dam water or buffer zone impact.

What can we do with what's left of our farms?

As the zoning rule states that land cannot be subdivided to less than 100 acres, and most of the inundated farmers run cattle, puts the farmer in the difficult position of being unable to continue farming, as the productive land is underwater or in the buffer zone, the remainder will still have to be maintained by the farmer. The simple task of crossing a gully to the next hill normally only 50m could become a 1km trip, over hilly terrain.

The stress and anxiety with regard to *"will the Clarrie Hall Dam be raised?"* has impacted on every decision we have made over the past few years and into the future. So, until this question has been laid to rest and real facts and figures are finalised we remain in limbo.

Besides the obvious dam structure, another feature which was underestimated in the original assessment was replacing McCabes Bridge. The new topographical maps have revealed that a bridge of approx. 150m in length and at a height of at least 6m above the existing bridge would have to be considered or alternatively another road access.

The suggested buffer Zone of 7m is 2m more than what exists today. Which has been more than adequate for a catchment of this size. If the Buffer Zone was retained at 5m and consideration given to widening the spillway to 50m, then fewer properties would be impacted.

Should the Clarrie Hall Dam be raised, then previously drier gullies would become wet areas and provide safe and sustaining habitats for fragile fauna and flora.

As diverse as our backgrounds are, the spirit of the Community which exists in the valley is one of **mateship**, whether someone needs a hand or just to throw a BBQ or a cricket day at Crams Farm, all the valley are invited to join in, and this community spirit will continue no matter what.

SAM DAWSON PRESENTATION

\$330Million)	
1650 full time jobs)	Tweed Tourism
859 indirect jobs)	

Tourism is 5.8% GRP TEDC

High unemployment – 42% (Work participation rate) compared to state average of 62%

- Low tourism spend and stay

There is an urgent need for strategies which encourage employment generation and growth.

"In terms of employment generation, there needs to be a change in the longterm visionary strategic planning approach, away from the simple rezoning of residential land to accommodate population and growth which as have proven, simple choices, an unsustainable serviced based economy."

TEDC presented a concept to TSC of a 475 Ha master planned community at Murwillumbah which includes a "precinct" for Eco-tourism (1.2Ha) too small, but it's the right idea.

Byrrill Creek has good potential as an Ecotourism destination or route. People already drive around the valley using that road. Other potentials could include Mountain bike races.

* Crams Farm – resume more land recreate facilities

Presentation by **Eddie Roberts**

Society is greatly affected by these types of developments. Uki community has a strong desire to become more sustainable and has done a study into ways to move in this direction funded by NSW I&I. Before any decision on a dam is made

- Demand management using world best practises must be implemented.
- Time must be allowed for these practices to take effect. The time frame for this proposal is too short.
- All new residential developments should be required to have at least 20,000 L of on site storage. Commercial developments should have water storage as well. This will also increase the community's resilience in case of natural disaster.

If this is done the Tweed Shire may not need extra dam capacity.

Dams when built create huge amounts of Greenhouse Gasses! Itone of GGs is released for every cubic Meter of concrete produced. When in operation the energy used in purifying the water also emits greenhouse gasses. This will further exacerbate the affect on society from climate change.

Byrill Ck has very high environmental as well as high social and economic value.

- Displacement of people, some of whom are very old, could have a disastrous affect on their health. Is this right?
- Loss of economic potential through the drowning of the valley and the Eco tourism it will support. Mountain biking and other eco friendly tourist ventures will be stifled. Later this month there is a race in Mebbin NP attracting hundreds of competitors and officials as well as spectators. This regular event will be lost as well as the income for the community it produces.

It is said the extra storage is needed for the doubling of the population by 2030. Then what? Will we double population again in the following 25 years? This is going to seriously affect society.

We live on a finite planet. Therefore, we, as a society must become and develop sustainably to survive. This huge population growth just to support shot term construction jobs is not sustainable. We can create jobs and wealth without destroying our environment.

Now is the time to show the world it can be done, as it can be, while we still have an environment to save.

PAUL HOPKINS

SOCIOLOGICAL IMPACTS

DIRECT

Dam environs:

Doon Doon dam will lose facilities at Crams Farm which is a heritage 1. environment that has taken much time and money to establish - all lost.

Re-establishment of recreational facilities will be costly and not as unique, 2 New foreshore will be steeper and not as salubrious as Crams Farm.

Byrrill Creek

Has had much money and energy spent on riparian restoration which provides a. not only wildlife habitat benefits but also social/recreational benefits.

The link road joining Uki with Tyalgum is a major tourist experience and a b. multiplier for the villages of Uki and Tyalgum. The loss of this linkage is a serious disbenefit.

INDIRECT

General

Such a huge expenditure of capital on the Bray Park plant, to purify all the Shires water to potable quality means that this facility demands more supply to justify the huge amount of capital invested.

No money left for on-site water tanks.

Residents encouraged to move from caring to non - caring

Less autonomy for residents means more dependence on big brother Council's engineering division and loss of self esteem and diminished respect for water - a limitless supply; just turn on taps no need to consider conservancy model Move from frugal to consumerism.

We should leave ou plant in a fille state them into me annuel

IUNY

SOME SOCIOLOGICAL ASPECTS OF THE **TWEED IN REFERENCE TO SUSTAINABLE WATER** SUPPLY.

A Few Statistics.

1) Present population 83,222 of which 18,165 are over 65(21.8%) 24,051 are under 25(28.9%) and indigenous 2,067. Ages65 to74 11.4% compared to Australia 6.8%. 25 to 44 age group 23.1% to 29.3%.

Housing 38% rental compared to rest of Australia 20%. 33.6% receiving housing benefit compared to rest of NSW 18.3%.

2) Residential development. In 2009 a group of scientists from 55 countries made the firm recommendation that no country builds on low lying areas near the sea. Our own federal Government had a survey commissioned by Penny Wong that there will be a 1.1 metre rise by turn of century and that Coastal flooding will occur at Terranora, Broadwater and Cobaki. This figure is now calculated to be too conservative by the United Nations Scientists. I should add that my researches suggest that this is a high risk strategy especially in the main areas earmarked for development.

3) Main employers are the retail trade followed by the cane farming industry

What are the Effects of increased population bearing in mind the above statistics?

1) Policing would have to at least double to cope with youths with few jobs. There are already problems with lack of police locally.

2)Government figures predict that people coming to this area to buy seaside houses will be mainly retirees and will thus put more pressure on medical services, and will require more financial support plus they will not create jobs.

3) Employment would have to increase dramatically if Tweedshire does not want to become a retirement area. How does the council propose to attract industry to the area?

4) There are insufficient local facilities such as public toilets, parking, seating areas, run down local hospital and under use of river facility. This will require significant investment greater than our local resources can afford

5) Public transport is poor with very few bus services, no train link to even our local airport and a defunct rail system just rotting. Here is an area that could not only create work but would assist in attracting industry to the area.

6) The area is unique in having the most heritage listed areas on the planet in close proximity yet there are very few footpaths or other facilities to enable people to enjoy it. Why are there no plans to create access to our forests and wild life which would also increase eco tourism? 36

7) A survey for the Sydney Morning Herald by Price Waterhouse Coopers states that a growth in population by 2050 to £6 million people is not affordable. Why then is our local council trying to fly in the face of such evidence and do the opposite?

8) lort will be born by prest esclut net reviones. 9) Salt is radioactive.

CONCLUSIONS:

A comprehensive local plan needs to be developed rather than a piecemeal approach to the Tweed Valley's future. With regard to the effects on the local population doubling the population in so short a time scale comes with huge risks as mentioned above plus it may not be financially sustainable without Federal Government support.

Water is not enough and there are many other options that could be looked at . Sociologists do not give the answers but only a very naïve person would not listen and act upon the questions.

TWEED DISTRICT WATER SUPPLY AUGMENTATION OPTIONS STUDY

TABLE 1: DETERMINATION OF COARSE SCREEN RATINGS

MULTI CRITERIA ANALYSIS FOR ASSESSMENT OF OPTIONS

		ENVIRONMENTAL ASSESSM			SMENT CRITERIA		SOCIAL ASSESSMENT CRITERIA			
	Option		Environmental Constraints	Gr	eenhouse Gas & Energy Consumption		Social Acceptability		Cultural Heritage Impacts	
No.	Description	Ratin	ng Description	Rating	Description	Rating	Description	Rating	Description	
1	Raising Clarrie Hall Dam	3	Some significant forest and threatened species have been identified in the area to be inundated. Preliminary investigations completed.	5	GHG emissions are high initially during the construction phase, but thereafter are negligible under normal operations.	3	Some land acquisition will be required and small deviation of local roads. Social impacts considered relatively minor since raising is on the site of an existing dam.	3	Sites of known Aboriginal significa will be inundated. Preliminary investigations completed.	
2	Byrrill Creek Dam Construction	2	Higher potential than CHD for impacting upon significant flora and threatened species in the inundated area and near the dam site.	4	GHG emissions are higher than for CHD raising during the construction phase, but thereafter are negligible under normal operations.	2	Some land acquisition will be required and probable closure, or deviation of Byrrill Creek Road.	1	Several sites of known Aboriginal significance will be inundated.	
5	Pipeline to SEQ Water Grid	5	Pipeline route is adjacent to the Tugun By-pass and along a future road reserve as part of Cobaki Lakes development.	1	GHG emissions will be relatively moderate during the construction phase. GHG emissions during the operating phase will be very high where purchased water is produced by the Tugun Desalination Facility.	3	Potential for water to flow in either direction. However, cross-border water transfers have previously been politically problematic.	4	Areas were previously identified ur the Tugun By-pass EIS, but the majority of construction will be in areas previously disturbed.	
c	Pipeline to Rous Water	4	Pipeline route is along the Old Coast Road, which has already been disturbed, but is in proximity to the Billinudgel Nature Reserve.	3	GHG emissions will be relatively moderate during the construction phase. Emissions during operations will be linked to mechanical and electrical plant for pumping.	3	Potential for water to flow in either direction, enhancing water security to both Tweed and Byron communities. However, inter-valley water transfers have previously been politically problematic	3	The majority of the pipeline would constructed in areas previously disturbed, but no investigations ha been carried out and an Archaeological Survey would be	

ο			billindiger Nature neserve.		electrical plant for pumping.		problematic.		required.
N T I G	Pipeline to SEQ Water Grid	5	Pipeline route is adjacent to the Tugun By-pass and along a future road reserve as part of Cobaki Lakes development.	1	GHG emissions will be relatively moderate during the construction phase. GHG emissions during the operating phase will be very high where purchased water is produced by the Tugun Desalination Facility.	3	Potential for water to flow in either direction. However, cross-border water transfers have previously been politically problematic.	4	Areas were previously identified ur the Tugun By-pass EIS, but the majority of construction will be in areas previously disturbed.
E N C Y	Groundwater	2	Borefields to be regulated for set-back distances from wetlands and for adverse effects upon terrestrial vegetation.	3	GHG emissions will be relatively moderate during the construction phase. Emissions during operations will be linked to the mechanical and electrical plant for pumping and water treatment.	3	Concerns may be raised over unacceptable environmental impact.	4	Traditional Owner groups regard groundwater resources as of particular cultural significance.

Notes: Rating is the impact upon the Assessment Criteria, which may be a risk, difficulty, etc.

- 1 High negative risk, impact, difficulty
- 2 Difficulties encountered, which can be managed with special treatment
- 3 Moderately straightforward with a low degree of difficulty
- 4 Low negative impact
- 5 Very low negative impact / excellent

APPENDIX E



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TWEED DISTRICT WATER SUPPLY AUGMENTATION OPTIONS STUDY

TABLE 1: DETERMINATION OF UPDATED RATINGS

MULTI CRITERIA ANALYSIS	FOR	ASSESSMENT	OF	OPTIONS

	ENVIRONMENTAL ASSESSMENT CRITERIA		SOCIAL ASSESSMENT CRITERIA			
Option	Environmental Constraints	Greenhouse Gas & Energy Consumption	Social Acceptability Cultural Heritage Impacts			
No. Description	Rating Description	Rating Description Ra	Rating Description Rating Description			
1 Raising Clarrie Hall Dam	Output of Environmental Impact Quantifier	Output of Environmental Impact Quantifier	Output of Social Impact Quantifier Output of Social Impact Quantifier			
² Byrrill Creek Dam Construction	Output of Environmental Impact Quantifier	Output of Environmental Impact Quantifier	Output of Social Impact Quantifier Output of Social Impact Quantifier			
⁵ Pipeline to SEQ Water Grid (Alignment A) Along Tugun By-pass	2 NPWS identified that there would be issues with threatened frog and bat species.	GHG emissions will be relatively moderate during the construction phase, but during the operating phase will be very high if sourced from the Tugun Desalination Facility.	Queensland DTMR strongly opposed to a pipeline parallel to the Tugun By- pass. Disruption expected in the RoseAlthough the majority of construction will be in areas previously disturbed, there are enduring Aboriginal values i the area of Cobaki Lakes.			
⁵ Pipeline to SEQ Water Grid (Alignment B) Cobaki Lakes Foreshore	DPI Fisheries and NPWS stated concern with ASS, frog habitat and in particular 3 protected migratory birds and shore bird roosting sites.	GHG emissions will be relatively moderate during the construction phase, but during the operating phase will be very high if sourced from the Tugun Desalination Facility.	Queensland DTMR strongly opposed to a pipeline parallel to the Tugun By- pass. Disruption expected in the RoseAlthough the majority of construction will be in areas previously disturbed, there are enduring Aboriginal values i the area of Cobaki Lakes.			
⁵ Pipeline to SEQ Water Grid (Alignment C) Future Road Reserve	Pipeline is along a future road reserve as part of Cobaki Lakes development, and passes some National Parks estate, which was compensation against the Tugun By-pass project.	GHG emissions will be relatively moderate during the construction phase, but during the operating phase will be very high if sourced from the Tugun Desalination Facility.	Pipeline in future road reserve. Disruption expected in the Piggabeen Road residential area. Aboriginal values in the future road reserve would be addressed in the Construction EMP.			

C	Pipeline to Rous Water	Pipeline route is along the Old Coast Road, which has already been disturbed, but is in proximity to the will be linked to mechanical and		3	Potential for water to flow in either direction, enhancing water security to both Tweed and Byron communities. However, inter-valley water transfers	3	The majority of the pipeline would be constructed in areas previously disturbed, but no investigations have been carried out and an		
0			Billinudgel Nature Reserve.		electrical plant for pumping.		have previously been politically problematic.		Archaeological Survey would be required.
N T I N G	Pipeline to SEQ Water Grid (Alignment C) Future Road Reserve	4	Pipeline is along a future road reserve as part of Cobaki Lakes development, and passes some National Parks estate, which was compensation against the Tugun By-pass project.	2	GHG emissions will be relatively moderate during the construction phase, but during the operating phase will be very high if sourced from the Tugun Desalination Facility.	3	Pipeline in future road reserve. Disruption expected in the Piggabeen Road residential area.	4	Aboriginal values in the future road reserve would be addressed in the Construction EMP.
E N C Y	Groundwater	2	Borefields to be regulated for set-back distances from wetlands and for adverse effects upon terrestrial vegetation.	3	GHG emissions will be relatively moderate during the construction phase. Emissions during operations will be linked to the mechanical and electrical plant for pumping and water treatment.	3	Concerns may be raised over unacceptable environmental impact.	2	Traditional Owner groups regard groundwater resources as of particula cultural significance.

Notes: Rating is the impact upon the Assessment Criteria, which may be a risk, difficulty, etc.

- 1 High negative risk, impact, difficulty
- 2 Difficulties encountered, which can be managed with special treatment
- 3 Moderately straightforward with a low degree of difficulty
- 4 Low negative impact
- 5 Very low negative impact / excellent

APPENDIX E

TWEED DISTRICT WATER SUPPLY AUGMENTATION OPTIONS STUDY - Environmental Impact Quantifier

		-	-		-			
Environmental Attribute	Raising of the Clarrie Hall Dam	New Byrrill Creek Dam (Small)	New Byrrill Creek Dam (Large)	Pipeline connection to Seq Water Grid (Alignment A)	Pipeline connection to Seq Water Grid (Alignment B)	Pipeline connection to Seq Water Grid (Alignment C)	Contingency Option	Comments
Loss of threatned flora and fauna species								
		1						
Loss of riparian vegetation and instream aquatic habitat (upstream)								
Area in Hectares								
Impact on riparian vegetation and instream aquatic habitat (downstream)								
Area in Hectares								
	-				1			
Loss of native vegetation								
Area in Hectares								
Loss of threatned or overcleared vegetation								
Area in Hectares					l			
Loss of old growth habitat								
Area in neclares		1						
Loss of Koala habitat areas								
Area in Hectares								
				-				
Loss of cleared land								
Area in Hectares								
Inundation (Loss) of National Parks Area in Hectares								
		•			•			
Inundation (Loss) of total land area								
		1						
		1	1					
Ground Water Impacts (Quantity)								
Withdraud rates		1						
Ground Water Impacts (Quality, salt water intrusion)								
Salinity etc.								
		T						
Greenhouse Gas footprint								
Tonnes of Carbon								



TWEED DISTRICT WATER SUPPLY AUGMENTATION OPTIONS STUDY - Social Impact Quantifier

Social Attribute	Raising of the Clarrie Hall Dam	New Byrrill Creek Dam (Small)	New Byrrill Creek Dam (Large)	Pipeline connection to Seq Water Grid (Alignment A)	Pipeline connection to Seq Water Grid (Alignment B)	Pipeline connection to Seq Water Grid (Alignment C)	Contingency Option	Comments
Number of affected properties requiring compensation								
No of known records								
Number of residents affected by compensation								
No of known records								
Number of residences inundated / lost								
Number of properties severed into two (or more) areas No of known records								
Total land inundated / lost								
			I	I		1		
Loss of Grazing land								
· · ·								
Loss of commercially Forested land								
			-	-				
Loss of other productive land								
Properties affected by public road / access issues No of known records								
Private or commercial groundwater bores impacted								
No of extractors								
Non-Indegenous Cultural Heritage sites								
Reduced water autonomy / Increased water restrictions								
Frequency								

Tweed District Water Supply Augmentation Options Study

Multi Criteria Analysis: Grouped Assessment Criteria Rating and Weighting Factors

Community Working Group Meeting No. 4 15 February 2010





BUILDING A BETTER WORLD
Multi Criteria Analyses

Triple Bottom Line

Quadruple Bottom Line (Sustainable Development)

- Environmental
- Social
- Economic

- Environmental
- Social
- Economic
- Governance

Assessment Criteria for this Study

- Social
- Economic

• Governance

- Environmental
 Environmental Constraints
 - GHG & Energy Consumption
 - Social Acceptability
 - Cultural Heritage Impacts
 - Established Technologies / Feasibility
 - Lead Time & Escalation
 - Costs (Capital, Operating, NPV, \$/ML)
 - Secure Yield
 - Planning Obligations
 - Legislative Acceptability

Multi Criteria Analysis - Rating For each assessment criterion and Option:

Rating is the impact, risk, or degree of difficulty



Multi Criteria Analysis – Weighting Factor

For each assessment criterion:

Weighting factor is the <u>relative</u> level of significance



Multi Criteria Analysis - Process





Minutes of the Water Supply Augmentation - Community Working Group Meeting held Monday 1 March 2010

Venue:

Canvas & Kettle Meeting Room, Civic Centre Tumbulgum Road, Murwillumbah

Time:

5.20pm – 11.20.pm

Present:

Facilitator: Stuart Waters (Twyfords) Tim Mackney (Public Works)

Rob Learmonth (Tweed Coast); Tony Thompson (Murwillumbah); Samuel Dawson (Environment); Richard Murray (Environment); Robyn Lemaire (Water User); Colleen Edwards (Landholder: Clarrie Hall Dam Area); Joanna Gardner (Landholder: Byrrill Creek Dam Area); Don Beck (Business/Commercial); Pryce Allsop (Business/Commercial); 5.34pm Cllr Dot Holdom (Tweed Shire Council) 5.40pm Cllr Phil Youngblutt (Tweed Shire Council) David Oxenham, (TSC staff) 5.50pm Anthony Burnham (TSC staff); Mark Hunting (MWH) Geraldine O'Flynn (Southern Cross University) Rachel Eberhard (Tweed Heads);

Apologies:

Jackie MacDonald (Aboriginal Advisory Committee)

Objectives:

To be a forum that will / where:

- establish and build positive relationships between the Council, key stakeholders and the broader community
- support two-way communication with key stakeholders and the broader community
- provide information to stakeholders and the broader community about the options, assessment processes and issues used to determine a preferred option
- provide feedback for stakeholders and the broader community on the options, assessment processes and issues used to determine a preferred option



- members can work together to identify environmental and community impacts of the options and to provide feedback on their prevention, minimisation and mitigation
- members can work together to identify opportunities for Council to communicate and consult with the broader community, and to provide feedback on the Council's consultation and communication plans and activities
- draft a report representing the views, interests and issues of members together with a summary of group recommendations for consideration by Council

Prior to the meeting, a photo was taken of the Community Working Group on the steps of the Civic Centre.

Meeting commenced 5.35pm

1. Welcome & Introduction by Stuart Waters.

Stuart directed the Group to review the minutes from the previous meeting.

Sam highlighted the wording "interdependence" be amended to read "independence" at bottom of Page 11.

Minutes of Previous Meeting:

RESOLVED that the Minutes of the DRAFT Minutes of the Water Supply Augmentation - Community Working Group Meeting held Monday 15 February, 2010 be accepted as a true and accurate record of the proceedings of that meeting.

Moved:	Rachel Eberhard
Seconded:	Rob Learmonth

All in favour.

Stuart directed the Group to review the agenda for tonight's meeting. The first item being a statement from the members of the CWG followed by a general discussion.

1. Statement from members - Discussion

Rachel took the floor and thanked the entire Group but in particular Tony Thompson, for assistance in formulating the statement. Rachel advised the Group held a meeting last Wednesday and had a lot of discussions and emails in the preparation of the statement. She advised this was Version 5 and the statement entitled "Formal Statement from Member of the Tweed Shire Council (TSC) Water Supply Augmentation Community Working Group (CWG) was submitted and signed by the majority of the Community Working Group. (See attached statement).

The major points addressed in the statement are:

- The need for additional water supply
- 4 water supply options presented
- CWG Process
- Conclusion



- The pipeline options (3 and 4) may be unviable due to the lack of political commitment from the host areas.
- We believe Byrrill Creek is of such high environmental significance that it should not be considered an option. The NSW Tweed Draft Water Sharing Plan clearly states that a new Byrrill Creek dam is prohibited.
- Thus the raising of Clarrie Hall Dam appears the only remaining viable option (of the 4 presented).
- We, and the community, would like to be reassured that TSC's demand strategy and water options selection process is in line with national and international performance standards, and appropriate to our environment.
- We strongly urge Council to commission an independent expert review of the need for additional water supply, prior to the commencement of detailed planning or environmental impact assessment of the preferred water supply option.

Discussion:

Rachel continued that there was a deep disquiet about where the CWG came into this process.

Stuart asked for the numbers for and against and if the Statement was supported in its entirety?

Don asked a question to the Council officers firstly – What were the findings Council made from the 3 information sessions held with the public? What was the feedback from those sessions?

Tim replied there was a very low turn out. The very small proportion of the population that attended makes it difficult to determine outcomes from the sessions alone. Those that did attend had a wide range of viewpoints from differing backgrounds. They raised many issues; some of which are contained within the CWG statement.

Don acknowledged it was poor attendance and was disappointed with the number of representatives from this Group that attended those Information Sessions.

Rachel said it was not practical for all of us to attend each session.

Tony agreed and said we were never meant to turn up to all the meetings.

Pryce said he was not in a position to support a Statement like this without being able to qualify and confirm the assertions. His question is if we have another 75,000 people come into the area and we have a drought – can we survive not having another water source? It is the unknown. If someone could qualify the information in the Statements then he could agree, however he is still not confident enough in the Statement at the moment.

Cllr Phil Youngblutt added we cannot stop population growth in the area.

Stuart again asked who can support the Statement in its entirety? Stuart asked for a show of hands.

8 agreed.



Pryce said he was not rejecting the document – if we have 75,000 more people in the Valley, how do we cope? Do we have enough water? If they are right, then we don't need another dam.

Don felt he was being railroaded – the remaining 2 options – he reiterated that is 8 people's view point not the whole of the Shire. This Statement needs back up. Everyone knows there is to be population growth – there's nothing to back the contrary – He doesn't think we can take this document as an 8 /4 vote. He is not supporting this particularly the removal of Byrrill Creek Dam as an option.

Rachel said the Group was careful about its statement. We were careful in our wording. We were not proposing on behalf of CWG. Only "we believe" rather than a statement of fact. We propose to attach this Statement to the minutes as a signed document.

Don referred back to the Statement and asked about the 3rd dot point – Stormwater harvesting – what is a costing on that?

Stuart asked for Cllrs Dot and Phil to contribute to the discussion.

Phil said the statement has as a supposition that there won't be population growth - there definitely will be. We must have secure water supply – the only way is Byrrill Creek or Clarrie Hall. There is no other alternative.

Joanna directed a question to Phil. 2 weeks ago at a Farmers Federation Meeting when they asked you about a groundwater options, isn't it true you said to them "don't bother – there are only 2 options, the dam options."

Phil confirmed he had, and replied that it was his personal opinion.

Joanna said to Phil – "Didn't you say the other options were just put in, so as to seem like there was a choice of options?" and so if you analyse it, that there are only 2 options in your view?

Phil stood up and replied - those comments are taken out of context – if you want to continue like this I will just leave.

Don asked for a point of order in the meeting.

Dot apologised for being late and added that she needed to go away and digest the Statement. Dot voiced she had not made up her mind on anything but will take all the information on board and decide on its merits. She advised most importantly from her perspective, is the Far North Coast Regional Strategy by which she is guided, also the Local Government Act and The Urban and Employment Land Strategy. She advised that she is guided by these types of documents and needs to absorb all that information. Dot advised she will not form an opinion at this point in time.

She reminded the CWG of her request at the outset of the process where she had said we all need to bring passions to the table and leave agendas at the door.



Stuart confirmed to the Group that this is not about forcing people to support a position that they don't agree with he will not allow that to happen. Maybe the majority will support x and some y – that is the process.

Stuart then asked Anthony and Tim if they would like to respond.

Tony interjected that if Phil had been here for more meetings he may have a better idea that population can be controlled; it was in a paper Tony had prepared and that report is attached to previous minutes.

Anthony said that he didn't wish to respond on any particular item – we are not here to convince anyone in anyway – I think we are covering ground already covered.

Tim added he wanted to thank the Group for the amount of work in preparing and submitting the Statement. He added that he was hoping to get a copy of it earlier – to get it right now is hard to provide feedback. Again there are a lot of points which have been brought up earlier.

Sam then added what this shows is that it has crystallised the ideas, a lot is repeated – this qualified our feelings, our questions haven't been answered regarding water harvesting, water recycling. We are basing this information on all the information which has been given to us. Our questions haven't been fully answered.

Phil added that with the developments coming on line, there will be an increase in the population coming into the area within the next 20yrs.

Rob explained the reason why he put his signature to the Statement by saying that professionally, his background is in the water and environmental areas – particularly water sharing plans. The Draft 2010 Water Sharing Plan stated that a dam can not be constructed on Byrrill Creek but that Clarrie Hall is possible. He also added it makes sense that the spillway at Clarrie Hall is widened as required by the 2002 Dam Safety Report during construction of the raising – there is a spillway caveat on the dam at the moment.

Don said of the document handed to us tonight - the public read the minutes of meeting – there will be areas of concern – I think this document should have been put forward at the public information sessions. This document should not go out to the public yet – at some point yes - but this is not the final story. Don asked for the minutes to reflect that if we had a decent attendance at the 3 public information sessions – we could have engaged the public more – if this document ends up in the minutes with a vote of 8 – that should not be the decision of the Community Working Group. Don raised a question to the 8 people who attended the meeting last Wednesday–if there is anyone that did not support the Statement?

Stuart asked the Minutes to reflect the following which was agreed by all CWG members:

This represents a statement of the CWG by 8 members. 8 people supported this document in its entirety and 4 did not.

Colleen said to Don this is close to your heart – the land at Byrrill Creek that was acquired 30yrs ago. The Council (& community) has a worthwhile asset in that land and it can be used for other things – it could be sold to support other initiatives eg rainwater tank rebates.



She agreed that there were only 40 people that attended those information sessions – 40 does not reflect the whole of the Tweed Shire.

Don's response was that neither does 80 at the Uki meeting on Saturday. Colleen responded that percentage wise; 80 is a lot from such a small community.

Tony asked for clarification – to leave this statement on the table does that mean another meeting?

Tim replied No the statement will be attached to the minutes just as previous minutes have had other handouts from members attached to them. This does not mean we need another meeting. The next thing to talk about tonight is the process from here.

Process from here

- How do we move forward and finalise

Stuart asked the Group to consider the 3 options: Clarrie Hall Dam, Byrrill Creek Dam and the SEQ pipeline options and which has the greatest environmental impact based on the information at hand. How can we assist Council with the options?

- Which has the most significant impact?
- What is the worst case scenario?
- Which has the least impact?
- And why?
- Where is council at?

Joanna addressed the Group with a statement advising that at the Uki Water Options Meeting, Ian Ratcliffe, Senior Solicitor, From the EDO (who was one of the presenters) had researched the legislation on both dam proposals— she produced a report and advised the largest ramification out of legislative research was that the Draft Tweed Water Sharing Plan stated new in-river dams were prohibited (read from statement attached).

In Part 9 Rules for granting and amending water supply works approvals, Division 1, General point 36

- 36 In-river dams

New in-river dams requiring approval within the Mid Tweed River Water Source and the Byrrill Creek Water Source on third order stream or higher are prohibited.

The Minister may consider applications for in-river dams within these water sources, excluding the Mid Tweed River Water Source and the Byrrill Creek Water Source, consistent with the principles of the *Water Management Act 2000*

She believes that for Council to put Byrrill Creek up as an option - is prohibited under the current legislation.

Anthony confirmed that was what the draft plan on exhibition had said. Council had made a submission in October 2009 for it to be changed and the prohibition be removed, but it is uncertain what will be in the final Plan.

Richard said But the plan is there now.



Anthony responded that it is a draft plan. The Water Sharing Plan is due to be gazetted in April 2010.

Joanna had researched this with Dept of Water representative, Tim Rabbidge in Alstonville, and there was an application to amend this clause, put in by Council on 25 Oct, Council's request came due to water supply. Byrrill Creek had kept coming through as high conservation however, if this amendment went through, construction of a dam would still require a comprehensive assessment to be done. This had also been confirmed by a meeting of inter-government agencies. Joanna said we were not given this information and felt that there appears to be some deception.

Anthony addressed Joanna's concerns - When Council started this process in 2007 – Byrrill Creek was an option like the others. In 2006 Council had responded to a draft Water Sharing Plan and then heard nothing from the NSW Office of Water until Sept 2009 when the draft Joanna has was produced. Council was given a short few week period to provide a response. Until that time Byrrill Creek Dam was an option and when we became aware it could be removed through that process we made a formal request to have that changed. As per the request made by Cllr Milne today – we emailed the group a copy of the full submission this afternoon.

Rob complimented what Anthony said and added that a dam on a 3rd order stream is generically included. He also sees that even if the prohibition is lifted, it will be very difficult to gain State Government license to construct and operate the dam. He also returned to his point that the other thing the CWG was not supplied with was there was already a caveat on replacement of the spillway at CHD since 2002.

Richard advised he had written to NSW Office of Water (Tim Rabbidge) and asked for a copy of the Tweed Draft Water Sharing Plan. This spells out what's allowed and what's not.

Anthony confirmed that Council provides a submission like anybody else. Rob agreed submissions are put in by community and Council.

Sam asked does the recommendation of this group have any bearing on this?

Joanna added that from a letter about legislation requirements from National Parks and Wildlife, it states National Parks would have to go through EPA Act and a detailed environmental statement (DECCW) and the Tweed Shire LEP would need to be amended. Parts of the park would need to be revoked and those parks were part of the North Eastern Forest Agreement and it would need to go through State & Federal government levels of approval..

Stuart added there are governance questions in relation to this.

Tim confirmed this and reminded the group of some of the other processes being undertaken in parallel to the CWG. For example:

 Council has engaged planning and legislative specialists to give professional advice on the governance issues raised by Joanna. Council has also held inter-governmental agency meetings to receive feedback from government departments. The results of those studies and meetings will be used as input to the MCA under the 2 criteria specifically for planning and legislation.



• In a similar way, Council continues to hold discussions with the Aboriginal community outside of the CWG forum. Their advice will be used as input to the Cultural Heritage criterion.

The CWG's focus is looking at environmental & social issues. The feedback will assist Council to better understand these impacts, and will be used as input to the MCA under the criteria specifically for social and environmental issues.

Stuart reiterated: We are looking at the environmental and social aspects.

Rachel wished that the CWG had been made more aware of those parallel processes – this would have given the CWG more confidence in Council's overall approach.

Tony queried why the CWG hadn't been informed about the submission regarding the Draft Water Sharing Plan. Why weren't people informed at the Council meeting?

Anthony replied that the limited time we had to respond did not fit in with a council meeting, so it was done at officer level (Anthony). Ultimately, if we find that Byrrill Creek is prohibited it would be taken off the table but if it was not we need to go through all avenues. Council historically has made an investment in that site and requested we get an opportunity to pursue that option and it be considered.

Tony again asked for clarification – has that had any bearing on the timeline set for the CWG agenda?

Anthony replied – No - we were asked to make a preliminary decision in 2006 and didn't hear anything more until Sept 2009 when we made a response. We have been working on both our demand management strategies and looking at augmentation options for a long time – these are not influenced by the timing of the Water Sharing Plan.

Joanna added, the Solicitors advice with the water sharing plan is that it is likely to endure for 10yrs – if the council makes a decision on these options prior to implementation of the Water Sharing Plan of the Tweed it might be easier to "get it through" – Council would only need a license for the construction of the dam under the existing Water Act, 1912 but once the Water Plan Act is in place it will be much tougher.

Anthony said because of the pending legislation – it would be highly unlikely that the NSW Office of Water would allow something like that to be "rushed through".

Both Rob and Rachel agreed with Anthony and added that the process Council would need to follow would not enable all of the studies and approvals to be gained in time anyway.

Richard added one of the social issues: Aboriginal Cultural Heritage – Council has had Aboriginal Cultural Heritage Studies done at Clarrie Hall in 2006 and Byrrill Creek in 2009 -We have been asked to consider the social issues and that is an item we have had no information on.

Tim responded that we gone over this several times previously. We are not able to pass on the reports without permission. Council is respecting the Aboriginal Advisory Committee requirements and requests. Our preference was to have representatives from the Aboriginal Community directly involved in the CWG, however the Aboriginal Community advised



Council that they preferred to be consulted directly in their forum – and we must respect that.

Rob advised he was speaking with a Tweed Byron Aboriginal Council member who had wanted to see a report sent to CWG. However he acknowledged that there are various views within the Aboriginal Community, and this view may not be representative of the AAC's standpoint.

Don added we have had an apology from Jackie McDonald for the last 4 meetings and she is has been provided with a copy of the minutes and other documents, so they are informed of the process.

Don then asked Anthony if the Council's solicitor is also up to speed with the legislative process. Anthony believes we have a handle on the situation. Council's legal counsel has not been briefed at this stage.

Pryce said I think that certain information on Byrrill Creek was not shared and that was disappointing. It comes back to qualification again. I still want to know what the repercussions are of a drought? I know Joanna you sent me information but I need someone to qualify or confirm that this is correct. It is significant information for the public.

Stuart said Byrrill Creek may have issues down the line but at this stage there is nothing there to say it is not an option.

Stuart then asked which is the last choice you would like to see environmentally?

Tony asked how do you compare such different environmental issues against one another? How do you compare a group of subjective things together – this is why we have to give a rating. There is a better method.

Mark stated that the MCA is a tool that deals with complex variables. In 2008 it was written into our Terms of Reference for the purpose of this study. MWH applied that tool, which was considered appropriate amongst others, however we could have used another one and then justified one against the other. The MCA was used for the course screen. From his perspective, he carried out the exercise and was not sure what the scores were going to reveal. As Rachel found when she played with the numbers previously, the MCA is robust.

Mark added, that the CWG needs to bear in mind the process that has occurred and how things have changed along the way – nothing is static:

- We are facing evolving legislation
- When we started there was no Desalination Plant at Tugun nor a SEQ grid
- In April 2010 there will be new legislation

We need to continually revisit things and ensure that the decision is based on the most up to date information at the time.

Rachel added she is happy to back Clarrie Hall Dam or Byrrill Creek Dam but not the pipeline option because there is not enough information on that option.

Colleen added with all the information to hand – just pick one option in your heart that says "I can live with that one".



Don and Rob agreed with Colleen.

Robyn said with the CHD option we were given a variety of height levels for the raised dam. Do we all assume its raised to the highest possible height?

Tim said it was an initial study – the final study clearly states 70m was the max height.

Sam suggested the group think about the 2 options with their connectivity and corridors ie wildlife corridors, proximity of dam to national parks and expanding the footprint – look at the bigger picture.

Rachel suggested the Group to give one of 3 options a grading either:-

- 1. Acceptable
- 2. Unacceptable
- 3. Don't know (various reasons)

Stuart asked the group to write down their thoughts and apply to the sticky board coded to: Red light – no cannot live with this choice Green light – yes can live with this choice Yellow – don't know enough

Tables attached.

2. Options Assessment - Assessment - Ratings

Stuart asked the Group for one word to describe the process so far:

Rachel	Validation
Sam	What I expected
Colleen	Relieved
Tim	Outliers - hopefully we have some common ground
Robyn	Understandable
Pryce	Difficult
Mark	Relieved
Phil	No comment
Don	As expected
Richard	Predictable
Joanna	the path of least resistance
Anthony	Group appears to have common ground
David	Interesting
Tony	Reflects an overall view
Rob	Qualified
Dot	Progress
	- 3

Stuart asked the Group what is all this telling us?

Rob - there's a trend



Sam - more info is required about the pipeline and if you want to build a dam go with CHD but hands off Byrrill Creek.

Pryce - social is not as big an issue as environmental Rob – again pipeline we don't know enough about it

Dot – to qualify why I am not putting anything up there or input because I will be one of 7 people making a decision on this, I would like to observe here tonight.

Stuart said within this group feedback was required on environmental and social impact. Your output to us will be channelled into our MCA tool. This tool uses numbers. If we can gain some kind of consensus to us for numbers, that is our ideal situation. Converting this type of exercise into numbers will be difficult. The process will continue after – if the group cannot provide numbers – TSC and MWH will interpret.

Stuart asked how useful it would be to apply numbers to their choices such as: 1 = Bad, 5 = Less impact

Joanna suggested the Group look at weightings first rather than ratings. She believes it is limiting the group rather than just environmental and social, to look also at legislative implications, Aboriginal Cultural Heritage and even established technologies.

Rachel asked if you want a number there is discomfort in averaging. How do we deal with consensus with some part of the group?

Rob added I am having difficulty with the numbers and I cannot give a rating to an unknown – professionally I won't go there. Figures can be misinterpreted in the future. The sticky board is what I have to say.

Sam supported Rob's comment also – when it comes to placing numerical value on qualitative data – it grossly oversimplifies our statements – so I have great reluctance to do this.

Colleen said to Sam you're qualified in this area and I'm not, so I would definitely have more difficulty.

Stuart asked is there a piece of advice we can offer input on the tool?

Mark said the MCA is a tool and it has limitations - we use them to decipher relativity of importance.

Tony added there is a better method than this.

Stuart asked if we could clearly say in terms of environmental impact, which option has the least level of resistance?

Response: Clarrie Hall Dam – am I right in saying CHD is regarded by most as having the lowest level of resistance?



There was general agreement in the room.

Don said to Stuart that this room does not reflect the broader views of the community.

Rob added we are part of the community. I understand Don's point, but in all honesty we are part of the process, not the answer.

Colleen added the community has had the opportunity to inform the process.

Tony I agree with those 2 members. Unfortunately to contact 70,000 people is a costly and time consuming exercise.

Stuart in terms of social - which of these options has the most support?

Clarrie Hall Dam?

There room again appeared to be in agreement.

Stuart said there seems to be some common ground, however there is a struggle for people to put a number on that - and that is to be expected.

Tim said it is a very difficult thing to do. If you aren't comfortable putting a number to it, no one will be forced to. He reiterated that the MCA does require numbers and that Council and MWH will have to interpret the outcomes of the CWG to convert to numerical values if the group cannot.

Pryce acknowledged that Joanna has worked very hard to get all this information. The people of the Valley should know this information. This should be made aware to the public that Byrrill Creek Dam wasn't a good idea. The public may have attended more sessions. What I am saying is that you need to have all the information – It's not fair to the public. There must be public knowledge that the Council is applying for this to be re-entered. It's not a bunch a crackpots that are green!. Someone else has said lets pull this choice off the table. But it may slide under the door – if the broader public are not made aware.

Phil said this option is still on the table – it's waiting on clarification from the State government.

Don added its not that many months ago the Gold Coast had water restrictions – why don't we put something in the Tweed Link to the majority of the Tweed Shire along the lines of - do you want to have water restrictions over the next decade or do you want water in the future – we might get some more feedback? People are concerned with supply of water.

Sam said that is too much of a binary question.

Tony said the majority has said no – surely the group says it is a no.

Rachel suggested the group might be able to provide some numerical feedback. Looking back on the ratings between CHD and BCD and in both cases, CHD has had a 3 "moderately" and BCD has had a 2 "more constrained" ratings applied.



Rachel asked the group if it thinks that the difference between BCD and CHD as represented environmentally & socially is greater than the relative difference shown by the 3 and 2 used?

8 yes 1 no 3 unqualified

Rachel asked whether the difference on just the environment is greater than 3 and 2? 9 yes 3 undecided

Rachel asked whether the difference on just the social issues is greater than 3 and 2? 5 yes 7 undecided

Colleen said there is a big difference with initial socially and down the track socially - the future of the valley.

- MCA weightings

Joanna again proposed we look at all weightings not restricted to just social and environmental because we're looking at the whole picture.

Sam believes we are not able to because too much detail and not enough expertise.

Tony wants numbers to put a score on it.

Stuart reminded him that the group had said no to numbers.

Stuart asked for discussion from the Group which is more important choice to them social or environmental?

Dot started discussion by stating in her view is social is more important because we can assist with nature and work with it - if we have everything in balance and work together as a co-operative society we can work together but not if we're killing each other for water.

Sam said his choice is environmental – if there is no environment – there is no society.

Robyn agreed with Sam – her choice is for environment.

Colleen in reply to Dot said we have a dam – it stopped the nature side of Doon Doon Creek. If we leave one stream open then nature can continue uninterrupted. The environmental aspect is more important because we have had it wrong so many times in history. Rather than greed, sit back wait and allow nature to reveal itself.

Joanna said we live in an area which has world heritage status – The environmental significance is what drew people here in the first place. We have a sacred mountain in the middle. We must preserve it – to destroy it is mindless. Environmental significance.

Rachel said we came here for the environment – it is a finite resource fantastic environmental global track of over exploitation.

Pryce said it is not an easy answer – Environmental is important. Social is so "spread out" – If I had long-term roots here I would be upset if my family was buried where it was to be



flooded. But do we want water in the future - yes we do. It's tough. When it comes to Council making a decision – everyone will lampoon them – he doesn't envy Council's job.

Phil said his vote is on the social side – We have to look that we will have 80-90,000 people plus that we must have certainty for the environment.

Don added that no one in the room would be aware that the Mebbin National Park was known as Mebbin Forest and prior to that it was a dairy farm. The environment comes back. If there was a dam built the environment would come back. We need to make a decision here for all the Tweed Shire. Both issues are important for the whole of the valley.

Richard added the environment is the most important factor. We have got available water here now without a dam option. These aren't the only options. It is a complex problem. Social in terms of more people to the valley is highly critical decision – environmental are we going to destroy a pristine area. Both are exceedingly important.

Rob agreed with Dot in that there needs to be the balance – environmental values enhanced by local LEP aimed strongly for environmental - yet realise the social impact. He believes innovative planning should embrace both.

Robyn added if you change the environment you will change the social implications – people will move away.

General consensus we can't have one without the other.

Sticky Board

Stuart asked everyone to re-do this exercise, but this time on the sticky wall.

Environmental Weightings

Tony – the group generally wants to give a rating to the option.

Stuart said one thing he can see is that social is not more important. In terms of weighting – 6 people feel environment should be weighted more heavily. No one feels social is more important than environment.

What's written on the whiteboard vs what's stuck on the sticky board are quiet different.

Tony has said people have listened to what the others have said and the question was asked incorrectly – giving the differing views.

Joanna wants some method to rate the other criteria.

Anthony asked Joanna and the group if he drew a matrix on the board showing the 10 weightings, would it be a helpful approach?. Dot asked for the group to do this via email for anonymity.

It was agreed unanimously.

Tim will prepare a weightings matrix for the group to weight as higher, lower or equal.



Colleen asked if we are coming to a conclusion tonight?

Tony asked if you send everyone an email you will average them out – what are they going to do the? It is not productive.

Tim said we will use Tony's approach of comparing the social and environmental criteria against each of the other criteria one at a time.

In terms of weighting all the criteria, he suggested we need to start from where Sam pointed out that we have struggled for so long as a group to become informed about the 2 criteria – we can probably give some good informed feedback on these criteria. To try and weight the other criteria will not be as meaningful, since we are not as informed in those areas. To get some feedback as to the relativity of the environmental and social against the other criteria or existing weightings would provide further assistance to Council.

How does this criterion weighted higher or lower than environmental or social?

Tony asked who selects the weightings for the criteria? We have all put time and effort into it. I am concerned we could do this, take an average and be way out.

Tim explained his thoughts on the whiteboard (see attached).

Richard added we have never talked about secure yield – water in Clarrie Hall Dam and water in the river – doesn't take into account water already available: greywater, reclaimed water and bulk stormwater harvesting..

3. The report - Select CWG recommendation text / Maximise our common ground

Stuart said to the Group that this is about providing Council with the things you believe are most relevant/important. As a group outline which are the critical pieces of information.

Prioritisation in dot form. The 3 things as a group we believe are critical points: Which criterion has the most significance.

Stuart and Tim produced a large scale flip chart of the draft report and asked the Group to apply colour coded dots to the most significant points itemised so far under each subheading.

Pryce suggested it would have been interesting to have recorded everyone's on the various options as a secret ballot at the beginning so they could have been compared with the final outcome now.

The Group progressed through the outline of the report indicating their preferences by highlighting the most important aspects contained within the report by placing red dots which showed more significance.

Tim highlighted under Success of demand management – points 2 and 3 were fairly similar. Both points where combined (see page 10). Points 5, 6 & 7 were combined.



The exercise continued throughout the report. Those issues supported by the most number of dots were brought into the "CWG Recommendations" section of the report. Members had the opportunity to have their disagreement to any of those issues noted.

- Pryce disagreed with page 14 some of those options don't appear to be options. Joanna wrote that we were boxed into 2 dams and 2 pipelines and that was what I meant by that statement.
- Pryce objects to a full EIS it would have cost the ratepayers. EIS on a preferred option, as Council has proposed is the more sensible approach.
- Rachel on page 14 the group is less comfortable with the process and starting point as a whole.
- Tony believes the last one page 15 "The purpose of the CWG.." is not relevant to this discussion.
- A number of people did not feel uncomfortable speaking on behalf of their constituents.
- Joanna I feel I can represent people from my area
- Colleen The value of water is devalued. Priorities for water.
- Don did not support 2nd point Water recycling before DAMS page 17.
- Tony raised a question for the need for a construction safety plan for CHD.

Rob suggested pick out one option but throw in some demand management strategies.

If Tony were given 4 options he could strike out 2 options. He would have liked to have seen 4 options he considered credible.

Rob disagreed and said there's nothing worse than giving the community 13 options and having to come down to 3. It is just information overload.

Pryce added Council will ultimately make the decision. How we go down the deciding factor I can't work out.

Environment

Colleen asked the question why employment generation is not considered ?

Robyn added there has been too little action by Council to push for 3 pipe system for Cobaki.

Joanna believes the rural areas are subsidising water for urban areas.

Population policy

Don asked is the current population sustainable?

Joanna Council has never looked outside the box with the types of the development being proposed. It could be much more sustainable.

Town planning

Robyn said the LEP is a separate issue.

Rob suggested we should lead not follow with our planning.



Miscellaneous

Tony added the compensation must be adequate based on a reasonable set of criteria.

It was agreed that Tim would use the information and exercises from tonight's weightings and ratings discussions to formulate the first part of the report. A copy would be sent out to the CWG members for confirmation before finalising.

Tim asked people to note that there would be deadlines placed on responses. No response by the relative deadlines will be considered as acceptance.

4. Other issues

Tim again invited the CWG members to the hand-over presentation and meeting organised for them on Thursday 11 March 1:30-2:30pm at the Civic Centre – Council Chambers Foyer. It will give the group the opportunity to officially hand-over the report to Council and mingle and discuss issues with the Councillors. A light finger food lunch will be provided.

Anthony outlined the process for the report to go on public exhibition. It will be recommended to Council's March meet on 16.03.2010 that the report be put on public exhibition and that the exhibition period be extended beyond the current 26.03.2010 closing date.

Joanna asked that the Demand Management Submission closing date be extended, and to be the same as the Water Option Submissions as the 2 are interlinked and its confusing to the public to have 2 different dates.

Joanna wants the closing dates extended and for the DMS to be also extended to the same final date.

Anthony responded that he can not confirm that, but will take the request on board.

Tim acknowledged Tony's kind offer to sit down with Council to give feedback on the community consultation process and how it might be improved. Tim proposed to send an email to the CWG Members at a future date "after the dust has settled" to gauge interest in such a process.

Richard tabled a letter addressed to GM, entitled "Request for an Expert Independent Review of Tweed District Water Supply Augmentation Project" signed by several members of the CWG. (copy attached).

Stuart asked for one word response to: How useful do you feel?

Necessary Achievement, Lot of work Validation, Happy Lot of discussion



No guarantee Interested in the final report Interested Better process tonight Concerned being overridden by council Valued Provide environmental and social vaules are used Somewhat useful Negligible,

Stuart and Tim acknowledged the enormous effort that the members had gone to and thanked the Group for their commitment to and participation in the process.

This was the final meeting of the Community Working Group. Meeting closed at 11.15pm

Post meeting note: Minutes adopted remotely by CWG 08.03.2010



Comparison of Environmental Impacts (sticky wall)

OPTION	Raise Clarrie Hall Dam	New Byrrill Creek Dam	Pipeline to SEQ Water
I can live with this option because:	CHD 2 [™] option Has further considerations to volume and water quality Tolerable with full EIS and mitigation options Least damaging Support, proviso – effective relocation of Aboriginal Cultural Heritage sites - Wildlife corridors - In tandem with contingency options Existing footprint – Still ecologically bad CHD 1st option CHD Environmental less damaging than other options Minimum impact - Maximum outcome Easiest less invasive \$8m on spillway not wasted even some positive	BCD 1 ^{°°} Option Byrrill Creek No 2 option	High greenhouse/carbon but min ecological
I don't know / am not sure	CHD is a last dam option subject to Council reusing available water		Not enough information - actual application seems unlikely under current political stands. Insufficient detail on options and environmental impacts No agreement with yet with QLD government Piped water supply uncertain Waiting for qualifiers Could have Aboriginal Cultural Heritage impacts
l cannot live with this option because:	Too much habitat destruction – koala habitat, gullies and farmland	High conservation value Not sustainable - Old Practice Illegal under Draft WSP Don't support Environmentally protected catchment In prohibited dam area Death for the Valley Many species under threat and Greenhouse gas Too high environmental conservation status on vegetation and fauna Ecological significance Unacceptable loss of high environmental values	SEQ No Option No an option due to ongoing costs and political Can't support GHG or marine destruction



Comparison of Social Impacts (sticky wall)

OPTION	Raise Clarrie Hall Dam	New Byrrill Creek Dam	Pipeline to SEQ Water
I can live with this option because:	Minimal impact socially - intact landholders needs to be met. CHD already damaged Least affected willingness of locals for shire benefit Community understand and have made provisions for the impacts. Support CHD 2 nd Option More acceptable to increase dam wall height than a new dam at Byrrill Creek	Support BCD 1 st Option Number affected will benefit the whole shire with secure water supply	People will support it
I don't know / am not sure	Don't believe we have adequately canvassed social impacts to distinguish between options Data about compensation	Don't believe we have adequately canvassed social impacts to distinguish between options	Piped water supply – uncertain SEQ – Politically unacceptable Least social impact compared to Dams but environmentally unacceptable Insufficient info on SEQ option
l cannot live with this option because:	Sacred sites flooded, farmers lose prime land or is cut up income lost	Valley people and accesses torn apart total decimation People will oppose it vehemently Don't support High ecological are required for future generations BCD loss to future generations of a major ecological asset Sacred sites, too many homes lost main access lost. Too much dislocation of community.	Can't justify power use and marine loss Short sighted unsupported by other parties. Many residents will be affected through this development



Which criteria is most significant – Environmental or Social? (sticky wall)

CRITERIA	Raise Clarrie Hall Dam
ENVIRONMENTAL	80,000+ are coming here in future because of the environment. Concrete and highrise are not attractive ENV (5) > SOC (3) – it is finite irreplaceable resource Save the environment - secure the yield – its all important Blank sheet (no comment) Sacred site, 60,000years of history. Why do we all live here? – heritage site, a special beautiful environment Society is only a part of the environment
BOTH	Inter-related Environment equally important / Socials is important – to save more available water is good for the environment Both important – water most important Both related Environmental issues have given us the society we have today. To drastically alter the environment will impact on the society, creating extreme social unrest. I won't have the luxury of being single issue focussed. I started the argument for the sake of it. Truth is I cannot separate one from the otherI have so much more to uncover, investigate, learn and quite possibly have a ball over. However I am going to have to make a decision and I will, when I have all the info.
SOCIAL	

MCA Discussion - Ratings

Option 1	Raising Clarrie Hall Dam	Environmental Constraints	GHG & Energy	Social Acceptability	Cultural Heritage Impacts	Established Technologies	Lead Time & Escalation	Costs	Secure Yield	Planning Obligations	Leg Acce
	Ratings	3	5	3	3	5	3	5	5	4	
Option 2	New Byrrill Creek Dam (16,300 ML)	Environmental Constraints	GHG & Energy	Social Acceptability	Cultural Heritage Impacts	Established Technologies	Lead Time & Escalation	Costs	Secure Yield	Planning Obligations	Leg Acce
	Ratings	2	4	2	2	5	1	4	5	3	
Option 5	Pipeline to SEQ Water Grid	Environmental Constraints	GHG & Energy	Social Acceptability	Cultural Heritage Impacts	Established Technologies	Lead Time & Escalation	Costs	Secure Yield	Planning Obligations	Leg Acce
	Ratings	5	1	3	4	5	4	2	3	2	







MCA Discussion - Weightings

Option 1	Raising Clarrie Hall Dam	Environmental Constraints	GHG & Energy	Social Acceptability	Cultural Heritage Impacts	Established Technologies	Lead Time & Escalation	Costs	Secure Yield	Planning Obligations	Leg Acce
	Weightings	4	3	3	4	4	2	4	5	4	
Option 2	New Byrrill Creek Dam (16,300 ML)	Environmental Constraints	GHG & Energy	Social Acceptability	Cultural Heritage Impacts	Established Technologies	Lead Time & Escalation	Costs	Secure Yield	Planning Obligations	Leg Acce
	Weightings	4	3	3	4	4	2	4	5	4	
Option 5	Pipeline to SEQ Water Grid	Environmental Constraints	GHG & Energy	Social Acceptability	Cultural Heritage Impacts	Established Technologies	Lead Time & Escalation	Costs	Secure Yield	Planning Obligations	Leg Acce
	Weightings	4	3	3	4	4	2	4	5	4	



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Option 1	Raising Clarrie Hall Dam	Environmental Constraints	GHG & Energy	Social Acceptability	Cultural Heritage Impacts	Established Technologies	Lead Time & Escalation	Costs	Secure Yield	Planning Obligations	Leg Acce
	Score = 151	12	15	9	12	20	6	20	25	16	
Option 2	New Byrrill Creek Dam (16,300 ML)	Environmental Constraints	GHG & Energy	Social Acceptability	Cultural Heritage Impacts	Established Technologies	Lead Time & Escalation	Costs	Secure Yield	Planning Obligations	Leg Acce
	Score = 117	8	12	6	8	20	2	16	25	12	
Option 5	Pipeline to SEQ Water Grid	Environmental Constraints	GHG & Energy	Social Acceptability	Cultural Heritage Impacts	Established Technologies	Lead Time & Escalation	Costs	Secure Yield	Planning Obligations	Leg Acce
	Score = 111	20	3	9	16	20	8	8	15	8	



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Formal Statement from members of the Tweed Shire Council (TSC) Water Supply Augmentation Community Working Group (CWG)

We the undersigned wish to make the following statement about the TSC's future water options and the community consultation process:

Firstly, we wish to acknowledge that the Tweed Shire needs to have a secure water supply for the future. Secondly, we would like to congratulate the TSC's efforts in engaging the community in this vital decision. As members of the working group we have been provided with lots of data and information regarding the options, but this does not readily translate into sufficient knowledge to alleviate our concerns.

The need for additional water supply

We have particular concerns with the assumptions that justify the need for additional water supply. These assumptions include population growth, community adoption of demand management and recycling strategies, and the associated costs. WATER MANG - WATER

SUPPLY AUG- comm Most importantly, the population growth and the water demand projections need to be reviewed. We are concerned with the impacts of Councils planned large population, in terms of impacts on the environment, social services and existing infrastructure. We propose an independent review of the water demand projections be carried out, including: FILE No.WARC MANG -

- population growth projections
- the potential impact of current and additional demand management strategies
- alternative in-catchment bulk water supply options (stormwater harvesting and febuse programs), and

DOC. No:

REC'D: - 3 MAR 2010

the impacts of climate change scenarios. .

Such a review, undertaken by a reputable scientific institution (e.g. University of Technology, Sydney or the CSIRO), would clarify whether the actions currently proposed under the water supply augmentation process are warranted.

The four water supply options presented

We are concerned that Council has already constrained their decision to the four water supply options presented, «

 \subseteq without establishing adequate community engagement processes or consideration of the impacts on carbon emissions and the loss of the environmental values of the areas that may be destroyed.

The pipeline options (3 and 4) may be unviable due to the lack of political commitment from the host areas. We believe the energy and carbon costs of these options are unjustifiable in this climate. Furthermore, groundwater extraction in coastal and hinterland areas is also likely to have significant environmental impacts and community opposition.

The remaining two options are the raising of the existing Clarrie Hall Dam and the proposed Byrill Creek Dam. We believe Byrrill Creek is of such high environmental significance that it should not be considered an option. The NSW Tweed Draft Water Sharing Plan clearly states that a new Byrrill Creek dam is prohibited. Thus the raising of Clarrie Hall Dam appears the only remaining viable option (of the 4 presented).

We would like to see the proposed independent review of the Demand Management Strategy evaluate the potential for additional water saving measures such as mandatory rainwater tanks, stormwater harvesting and recycled water before committing to the raising of Clarrie Hall Dam. Contingency options should be regularly reviewed as new technologies emerge and costs change.

The CWG process

We appreciate the efforts that TSC has made to engage us, as community representatives, in this process. However, we feel that the process has been rushed and some of our concerns dismissed. In addition, the engagement of the wider community has not been adequate for such an important and complex issue with long-term ramifications for the Shire.

In Conclusion

We, and the community, would like to be reassured that TSC's demand strategy and water options selection process is in line with national and international performance standards, and appropriate to our environment. We strongly urge Council to commission an independent expert review of the need for additional water supply, prior to the commencement of detailed planning or environmental impact assessment of the preferred water supply option.

Signed: J. Gardred	1/3/2010	JOANNA GARDNER Po box 3322.
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KLOHAMOTTY		ROBERT LEARMONTH
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Sofa	1/03/2010	AVTHONY THOMPSON
Tony THOMPSON		20 BLACK WOODS ICE.
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Draft Water Sharing Plan Tweed River Area unregulated and alluvial water sources



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Minister's foreword

I am pleased to place on public display the draft water sharing plan for the Tweed River Area Unregulated and Alluvial Water Sources, 2009.

Water is a key natural resource, vital for the health and survival of our native flora and fauna. It is essential for hasic human needs and agricultural production, as well as for recreational and aesthetic purposes.

Commencing a water sharing plan will be a significant step for the future management of the unregulated rivers within the Tweed River catchment and the adjoining smaller coastal catchments of Cudgen, Cudgera and Mooball Creeks.

The Plan, once finalised and gazetted under the Water Management Act 2000, will be legally binding for 10 years. The Plan will provide clearly defined access rights and a decade of security and certainty for all water users, including irrigation, town water supply and the environment.

The draft Plan was developed by an Interagency Regional Panel comprising staff from the former Department of Water and Energy, Department of Environment and Climate Change, Department of Primary Industries and the Northern Rivers Catchment Management Authority. It builds on the work done by the Far North Coast Water Management Committee during the first round of water sharing plans. While some targeted consultation has already

occurred with a number of the key stakeholder groups, further public comment is essential to this process.

The draft Plan proposes a number of new provisions to maintain and improve the long-term health of riverine ecosystems as required by the State Plan. The draft Plan will benefit from community input. I'd like to draw your attention to some particularly important recommendations and have highlighted each of them in the text of the Jraft Plan as Minister's Notes. Your comments on these aspects are especially invited.

The draft plan will be on public exhibition until 9 October 2009. I commend this draft plan to you and ask that you make submissions on its content. A submission form is available from www.dwe.nsw.gov.au

All submissions will be referred to the Interagency Regional Panel for consideration. It is intended that the water sharing plan will commence on 1 April 2010.

To obtain the best outcome for all, it is important that water management is a shared, community-driven process. I look forward to receiving your comments on this draft Plan.

The Hon. Phillip Costa MP

Phillip Rosta

Minister for Water

extract from DRAFT Water Sharing-Plan

Part 9 Rules for granting and amending water supply works approvals

Division 1 General

34 Granting and amending water supply works approvals

This Part is made in accordance with sections 21 (b) and 21 (e) of the Act.

35 Runoff harvesting dams

- (1) New or expanded runoff harvesting dams shall, in addition to other considerations, be subject to the dam capacity not exceeding that which is consistent with the access licence share component specifying the runoff harvesting dam as the nominated work.
- (2) When the share component of an access licence that nominates an approval for a runoff harvesting dam is reduced either by the Minister, or on application of the licence holder, or by an assignment in accordance with Part 13 of this Plan, the Minister shall impose an additional condition requiring the dam to be modified so as to reduce its capacity, or requiring the water taken and evaporated from the dam to be reduced, consistent with the reduction in share component.

Note. Extraction of water from a runoff harvesting dam requires an unregulated river access licence nominating an approval for a runoff harvesting dam, unless the runoff harvesting dam is within the maximum harvestable right dam capacity for the property on which it is located, in which case no licences or approvals are required.

Note. Following the assignment of water allocations from a water allocation account of an access that nominates an approval for a runoff harvesting dam, the Minister may impose conditions requiring that runoff harvesting dam by-pass flows.

36 In-river dams

New in-river dams requiring approval within the Mid Tweed River Water Source and the Byrrill Creek Water Source on third order stream or higher are prohibited.

The Minister may consider applications for in-river dams within these water sources, excluding the Mid Tweed River Water Source and the Byrrill Creek Water Source, consistent with the principles of the *Water Management Act 2000*.

Note. Taking of water from an in-river dam requires an access licence unless it is taken in accordance with section 52 of the Act (domestic and stock rights). In either case, however, the dam requires a water management works approval unless exempted by regulation under the Act. All new or modified in-river dams will also require assessment under the Fisheries Management Act 1994.

Division 2 Taking water from the alluvial sediments

37 Rules for granting or amending water supply works approvals being used to take water from the alluvial sediments

This division is made in accordance with sections 21 (c) and 21 (e) of the Act, to minimise extraction interference between neighbouring bores and to ensure minimal harm to groundwater and their dependent ecosystems.

Note. Extracting groundwater results in the draw down of water levels in the vicinity of the extraction. It is important to manage these local effects. Extraction may result in unacceptable water level declines in other works/bores close by, increasing the pumping costs associated with this extraction, or even cutting

Part 16 Amendment of this Plan

78 Amendment of this Plan

This part is made in accordance with section 45 (1) (b) of the Act.

79 Amendments due to floodplain harvesting

This Plan may be amended so as to provide for the floodplain harvesting of water, subject to the amendments not affecting the outcomes of the long-term average annual extraction limit specified within this Plan.

Note. This means that this Plan can be changed to issue and manage floodplain harvesting licences provided that the long-term average annual extraction limit (LTAAEL) does not increase or decrease. Floodplain harvesting in coastal systems is limited compared to inland systems. By not amending the LTAAEL with the granting of these licences, coastal systems are being consistent with inland systems where growth is managed within the existing LTAAEL.

80 Amendments for stormwater harvesting

The Minister may, under section 45 (1) (b) of the Act, amend: (a) Part

3,

- (b) Part 4, (c) Part 8,
- (d) Part 9, (e) Part 10,
- (e) Part 11, Division 2 and 3, (f) Part 14,

and

(h) Part 15,

to include rules for any new category of access licence established under the Act for the purpose of stormwater harvesting.

81 Amendments for possible enlargement of Clarrie Hall Dam

K Water Managament act.

extract from DRAFT Water Sharing Plan

The Minister may, under section 45 (1) (b) of the Act, amend any relevant clauses of this Plan as a result of any future enlargement of Clarrie Hall Dam in the Mid Tweed River Water Source.

TWEED SHIRE COUNCIL SUBMISSION TO AMMEND DRAFT WATER SHARING PLAN 25TH OCTOBER 2009

The blue contour line represents a proposed top water level of 125 m AHD and the red contour line represents a maximum flood level of 130 m AHD. This size dam would have an approximate capacity of 36,000 ML. Larger sized copies of these maps are provided in the attachments to this submission.

Council requests that the Draft Water Sharing Plan be amended to permit the option of a future dam for town water supply at Byrrill Creek.

8. Trading rules

Are these too restrictive or insufficient to protect environmental/cultural values? (Refer to Part 13 Access licence dealing rules).

It would appear that Part 13 clauses 69 to 73 inclusive, prohibits any transfers from Tweed Shire Councils Water Act Licences to other adjacent Water Utilities/Authorities in NSW and QLD. This prohibition removes all cost effective options available to Council for drought management contingencies and significantly reduces available options for water supply augmentation.

Council requests that the Draft Water Sharing Plan be amended to permit options for the transfer of water to and from adjacent Water Utilities/Authorities in NSW and QLD for town water supply purposes with in the share component of the Mid Tweed Access Licence.

9. Water access licences that can be applied for

Are the categories of access licence which can be applied for appropriate? (Refer to Part 8 Rules for granting access licences)

No comment provided.

10. Circumstances where plan can change

Are the circumstances appropriate? (Refer to Part 16 Amendment to this Plan)

Council would request that the Minister also be able to amend the Part 13 - Access Licence Dealing Rules, of the Draft Water Sharing Plan to accommodate Council's request in item 8 above, to permit options for the transfer of water to and from adjacent Water Utilities/Authorities in NSW and QLD for town water supply purposes with in the share component of the Mid Tweed access licence.

11. Mandatory conditions

Where existing licence cease to pumps are at a higher level of restriction than the access rules proposed under the draft plan the existing cease to pump will continue to apply. Do you consider this to be appropriate?

Council considers the mandatory conditions appropriate.
Relative Weightings for MCA Criteria

Historically	Environmental Constraints	GHG & Energy	Social Acceptability	Cultural Heritage Impacts	Established Technologies	Lead Time & Escalation	Costs	Secure Yield	Planning Obligations	Legislative Acceptability
Screening Report)	4	3	3	4	4	2	4	5	4	4

CWG Member assessment

Name:

Social Criterion	Environmental Constraints	GHG & Energy	Social Acceptability	Cultural Heritage Impacts	Established Technologies	Lead Time & Escalation	Costs	Secure Yield	Planning Obligations	Legislative Acceptability
In your view are social issues more or less significant than these other criteria:										

Environmental Criterion	Environmental Constraints	GHG & Energy	Social Acceptability	Cultural Heritage Impacts	Established Technologies	Lead Time & Escalation	Costs	Secure Yield	Planning Obligations	Legislative Acceptability
In your view are environmental issues more or less significant than these other criteria:										

23/2/2010 LANCE TARVEY NATIONAL PARKS & WILDLIFE SERVICE MURWILLUMBAH

Dear Lance,

Thanks for your information over the phone. If you could you please clarify the questions below via email by Thursday if possible?

Many Thanks for your time, Joanna Gardner

REPLY 24/2/2010 from Lance Tarvey

Please see my notes below. I should clarify that my answers relate to my role as an officer of the Parks and Wildlife Group within the DECCW. They are preliminary in nature & may not be comprehensive. No doubt numerous other issues are likely to arise during the planning and assessment process.

Regards, Lance Tarvey

1. Approximately how many hectares would be inundated of both National Parks(For Byrrill Creek the larger 36,000ML dam)

Council's Fact Sheet 6 (raise Clarrie Hall dam) states that "approximately 2 hectares of the flood inundation area lies within Mount Jerusalem National Park". Fact Sheet 7 (construct Byrrill Creek Dam) doesn't estimate area affected within Mebbin National Park other than to state that the "inundation area encroaches on the boundary with Mebbin National Park. Depending on the size of the dam, the inundation area would either border (the park) or cover low lying areas up to two kilometres into the park's north-eastern corner".

From the flood level indicated on the map on Fact Sheet 7, my estimate is that approximately 15 to 20 ha of Mebbin National Park would be inundated at times of flood.

2. What do you see as the major environmental impacts for both dams?

Areas potentially inundated within Mebbin NP contain some important vegetation including the sub-tropical rainforest near Cutters Camp adjacent to Byrrill Creek and is also likely to inundate the Byrrill Creek walking track in the park.

The nature of dams is of course that they flood gullies which typically contain deeper soils and are generally more moist than ridges. Hence they contain rich vegetation (especially rainforest) and in the Tweed will contain threatened plant species and probably Endangered Ecological Communities.

Other impacts could be fragmentation of habitat and barriers to fauna movement.

Threatened fauna is likely to be affected eg the Golden-eyed Barred Frog (*Mixophyes iteratus*) and the Large-Footed Fishing Bat (*Myotis adversus*) are known from the inundation area within Mebbin NP. Detailed survey will no doubt reveal more.

Fact Sheet 7 notes that Aboriginal Sites will be affected, detailed survey could reveal additional sites including on park.

The above is not comprehensive and further issues may be raised by DECCW.

3. Mebbin Campground would be cut off from existing road access, both from Tyalgum & Cadell Road... What do you see as the solution?

There is no really obvious solution. Any options require a much more detailed examination. The below are just preliminary thoughts no doubt many other issues could arise for consideration.

To approach the campground from the south it may be feasible to construct bridging south of the campground but cost may be prohibitive.

To approach from the north new roads could be constructed around the head of the dam waters but obviously this would have major environmental impacts.

An alternate route via Brays Creek road into the park and along closed fire trails could be developed but would bring traffic down Brays Creek Road (so impact on residents who currently experience no through traffic) and add considerable distance to the journey.

Perhaps consideration could be given to closing Cutters Camp and establishing a new campground at a more easily accessible location but this would require detailed investigation.

4. Have National Parks discussed with Tweed Council compensation or rededication of other land, for the land that would be inundated?

In short no but it is early in the planning process. I think there are 2 aspects to this; firstly compensation for loss of park estate and secondly the broader issue of compensating for loss of biodiversity.

5. What sort of legislative requirement would be needed during this process? Particularly, as I understand, that both National Parks were part of the RFA agreement.

The planning process is set out in the NSW Environmental Planning and Assessment Act other presenters are more qualified than myself to comment on legislative requirements. I assume that a detailed Environmental Impact Statement would be required as part of this process. DECCW may have a concurrence role.

I would say that park areas that would be affected by either the Byrrill Creek Dam or the raising of Clarrie Hall would need to be revoked (ie removed from the park) and that this can only be done by act of state parliament. This is thus at the discretion of parliament and of course can't be guaranteed.

The Parks and Reserves of the Tweed Caldera Plan of Management (which includes Mebbin and Mt Jerusalem NP's and is a statutory document) would need to be amended. Tweed Shire LEP would need to be amended and areas zoned to permit either of the dam proposals.

As you note above both parks were established as part of the Upper North East Forest Agreement, an agreement between state and federal governments and the timber industry, and following a detailed forest assessment. I'm unsure of the implications of revoking parts of either park for the Forest Agreement but I imagine that negotiations would have to be entered into again with both governments and the timber industry. It does sound complex.

6. The Council owned land, bordering Mebbin National Park, has not been environmentally assessed (except for 10% of the land for forestry plantation, & timber harvesting) Would you consider that a full EIS would need to be carried out on this land <u>prior to</u> a decision by the CWG or Council on whether to go ahead with the dam or not? And would this also be the case with Clarrie Hall area?

I think the actual process is matter for Tweed Shire Council and the NSW Dept of Planning (as set out in the EPA Act) but I would say a comprehensive and detailed assessment needs to be undertaken prior to any decision being made to approve any of the options including the Byrrill Creek Dam or the raising of Clarrie Hall Dam.

28 February 2010

116 Harbour Drive Tweed Heads NSW 2485 ·

The General Manager, Tweed Shire Council, PO Box 816, Murwillumbah, NSW 2484

Dear Sir

<u>Re request for an expert Independent Review of the</u> <u>Tweed District Water Supply Augmentation Project</u>

At the last meeting of the Community Working Group (CWG) on the 1 March 2010, a majority of Community members signed a formal statement:

"We strongly urge Council to commission an independent expert review of the need for additional water supply, prior to the commencement of detailed planning or environmental impact assessment of the preferred water supply option."

We now request that Tweed Shire Council seek an independent review of the Option selection process; the water demand management projections; projected population growth; and that the impacts of climate change scenarios be carried out.

Tweed Shire Council selected Montgomery Watson Harza (MWH), an international water consultancy some two years ago to manage the screening of Tweed water supply Options Stage 1 and Stage 2; prepare Tweed Shire Council's 'Drought Management Strategy'(2009); prepare the Demand Management Strategy Versions (2008) and (2009) and jointly assist in the Community consultation process and other related matters.

MWH will even assist finalisation of the MCA Report containing CWG recommendations and all public submissions before finally going to Tweed Shire Council, who will make the final decision on Tweed's bulk water supply option.

.Throughout the Tweed District Water Supply Augmentation Project, MWH has been supported by a seconded officer from NSW Public Works and Tweed Shire Council staff.

Although many reports were referenced during the project many consider that the project was an 'ln house' affair, and therefore an external independent review of the whole project would be beneficial to ' council

Background to this request for independent expert review

Coincidently, another part of this international consultancy 'MWH Australia' was a joint consultant that recommended the construction of the Traveston Dam to the Queensland Water Commission.

While the Queensland Government approved of the Traveston Dam's construction, the Federal Government did not give its approval and this dam did not proceed after much controversy. The Federal Government rejection may have been on environmental grounds but an independent study by the Institute for Sustainable Futures, University of Technology Sydney may also have had some bearing on the final decision.

The Mary River Council of Mayors commissioned an independent review of supply and demand side options for the SEQ region. An independent study was prepared by the Institute for Sustainable Futures, University of Technology Sydney.

Concerns of the Mary River Council of Mayors included:

• the direct and significant impact of the Traveston Crossing scheme on their area and community;

• the perceived deficiency in community consultation and the decision-making processes; and

• concerns that the Traveston Crossing scheme is inappropriate from economic, social, environmental and risk perspectives,

The independent expert review found:

- A diverse portfolio of options can ensure supply security for South East Queensland (SEQ) well into the future, certainly to 2050. Such options include: increasing water supply availability (supply-side options); decreasing the demand for water (demand-side options); and meeting water supply needs during deep droughts (drought response options).
- With the implementation of demand-side options, in addition to the existing suite of supply-side and demand-side options proposed by the Queensland Government, there will be no need for the Traveston Crossing scheme, or other additional supply infrastructure, in order to meet the supply-demand balance over the period to 2050.

Page 72 - Review of Water Supply-Demand Options for South East Qld - Final Report.

Our Group sees some relevance between the proposed construction of the Traveston Dam and Council's proposed construction of either their number one rated option 'Raising the Clarrie Hall Dam Wall or Number two option 'A new Dam at Byrrill Creek.

The CWG considers that the Water Project Team has not built a convincing business case for either Dam option without considering an adequate reduction in Tweed Shire's demand for water including reuse and new supply programs

There is conflicting information between several Council documents: Demand Management Strategy Versions 2008 and 2009, Drought Management Strategy April 2009 which makes it difficult for residents to easily understand. Consequently very few written submissions were received by Council in response to Stage 1 of Tweed Shire Council's Demand Management Strategy (2008).

WaterTSC advised CWG Members in December 2009 that: "an expert review of the entire process and EIS recommendations will be carried out by an independent consultant to give Council further certainty. before applying for development approval."

menber

The CWG and our community requests that Council seek an expert Independent Review from a reputable institution like the Institute for Sustainable Futures, University of Technology Sydney or the CSIRO and not just only another water consultancy. The independent expert should review the Option selection process; water demand management projections; projected population growth; and the impacts of climate change scenarios.

Yours sincerely

01/03/10 P.EBERRHMR

Members of the Community Working Group

Tweed District Water Supply Augmentation Project

- Gardron

B2: List of information shared

B2.1: Council to CWG

E

CWG Meetings		
CWG Meeting 1 01/12/2009		Meeting Agenda
		Process Agenda - Proposed Meeting Dates
		CWG Contact List
		Draft Terms of Reference V2
		Fact Sheets x 9 (4 bundles)
		Tweed District Water Supply Augmentation Options Study
		Appendix E Extract x 2 (Tweed District Water Supply
		Augmentation Options Study)
		$BC \Delta 3 map \times 2$
		Pipeline to SE OLD Grid A3 map
		Presentation to CWG - Overview
		Presentation to CWG - Scope Outline
		Twyford CWG slides
CWG Meeting 2	18/01/2010	Meeting Agenda
		Draft Minutes of 1 December 2009 Meeting
		MWH Tweed Shire Council Demand Management
		Strategy A1187200 - Dec 2009
		MWH Tweed Shire Council Demand Management
		Strategy – Stage T MW/H Twood Shire Council Domand Management
		Strategy – Stage 2 Non-Residential Program Evaluation
		A1187200 – December 2009
		Natural Heritage Trust The Restoration Prioritisation of
		High Conservation Value Riparian Lands of the Upper
		and Mid Tweed River. A Preliminary Survey Using a
		Rapid Assessment Approach.
		Northern Rivers Catchment Management Authority Byrrill
		Creek Riparian Rehabilitation Plan – March 2006
		Peter Parker Environmental Consultants Pty Ltd Byrrill
		Creek Forestry Venture An Environmental Assessment of
		Selected Harvesting – August 2000
		Creek Reafforestation Programme & Flora and Fauna
		Assessment – December 1998
		Greenloaning Biostudies Ptv Ltd Proposed Raising of
		Clarrie Hall Dam – Final Report - April 2008
		Presentation - a Two-pronged approach
		Presentation - 4 shortlisted options
CWG Site Visit	01/02/2010	Agenda
		Activity Sheet
	04/00/00/0	Site visit map
CWG Meeting 3	01/02/2010	Agenda
		Drait Minutes of 18 January 2010 Meeting
OWO Meeting 4	1 - 100 100 10	Lable 1- The Importance of CHD and BC Issues
GWG Meeting 4	15/02/2010	Agenda

		Draft Minutes of 1 February 2010 meeting Presentation by Stuart Waters, Twyford MWH (Mark Hunting) Presentation Social Impact Quantifier Environmental Impact Quantifier
CWG Meeting 5	01/03/2010	Agenda
		MCA Discussion Ratings and Scores Public Information Session Notes - Tweed Heads Public Information Session Notes - Murwillumbah Public Information Session Notes - Pottsville Questions Register as at 26 February 2010 Estimate check for new Clarrie Hall Dam Technical Note 2: Large Stand Alone Rainwater Tanks - by MWH Draft CWG Report

Outwards Emails		
Outwards Email	04/12/2009	Draft Minutes of 1 December 2009 meeting
		CWG Terms of Reference
		Presentation Scope Outline
		Presentation Overview 2
		Twyford's Presentation
Outwards Email	17/12/2009	Questions Register
		CHD Determination of Options Size and Dam Raising
		Options Study Final Evaluation Report
		DMS Extracted Graphs and Curves
		Tweed Shire Leakage Report
		IWCM Water Modelling
		Appendix A Table
Outwards Email	17/12/2009	Rainwater tanks
		MWH & Public Works report, Construction of Dam on
Outwards Email	17/12/2009	Byrrill Creek Update of Cost estimates, Dec 2009.
Outwards Email	17/12/2009	(report distributed 16.12.2009)
		Demand Management Strategy Stage 2 - Combined
Outwards Email	22/12/2009	Final Dec 2009
		Demand Management Strategy Stage 2 - Amended Final
		Dec 2009
		Demand Management Strategy - Stage 1 Amended Final
Outwards Email	22/12/2009	Dec 2009
Outwards Email	22/12/2009	CWG Questions Register
		CHD Raising Cost Estimate
		TSC Water Supply Figures
Outwards Email	13/01/2010	Meeting 2 Agenda
		CWG Terms of Reference
		Draft Minutes of 1 December 2009
		Augmentation 2nd letter
Outwards Email	21/01/2010	Minutes of 1 Dec 2009
		CWG Terms of Reference
		Minutes of 18 January
Outwards Email	21/01/2010	Minutes of Meeting 2

		Adopted Minutes of 1 December 2009
		Draft Minutes of 18 January 2010
		CWG Terms of Reference
Outwards Email	28/01/2010	Agenda for Meeting 3
		Site Visit Map
		Itinerary for Site Visit
Outwards Email	02/02/2010	Media Release for Public Meetings
Outwards Email	04/02/2010	Draft Minutes of Meeting 3
Outwards Email	05/02/2010	Presentation and Preparation for CWG Meeting 4
Outwards Email	05/02/2010	Site Visit Work Sheet
Outwards Email	09/02/2010	Questions Register Update
		BCD Council Owned Land
		BCD NPWS
		CHD Council Owned Land
		CHD NPWS
		TSC Water Monitoring
Outwards Email	10/02/2010	Draft Notes from Site Visit
Outwards Email	11/02/2010	Agenda for CWG Meeting 4
Outwards Email	12/02/2010	Minutes from Meeting 3 and notes from site visit
Outwards Email	17/02/2010	Draft outline of the CWG Report
Outwards Email	18/02/2010	Draft Minutes of 15 February 2010
		Adopted Minutes of 1 February 2010
		Site Visit Notes
		Joanna Gardner's amendments
Outwards Email	19/02/2010	Social and Environmental Matrices
Outwards Email	22/02/2010	Proposals for Report
Outwards Email	22/01/2010	The organising of the Public Meetings
		Annual volumes Estimate at Bray Park Weir 1969 to 2009
Outwards Email	23/02/2010	and NRCC Fortnightly Report
Outwards Email	26/02/2010	CWG Meeting 5
		Draft Minutes of Meeting 15 February 2010
		Agenda for Meeting 5
		CWG Report Rev4
Outwards Email	01/03/2010	Submission to draft water sharing plan
Outwards Email	02/03/2010	Weightings table

B2: List of information shared

B2.2: CWG to Council

CWG Meetings			
CWG Meeting 2	18/01/2010	An Overview of the Byrrill Creek Dam Area by Joanna Gardner	
		Caldera No Dams by Sam Dawson	
CWG Site Visit	01/02/2010	Points of Interest CHD - Colleen Edwards	
CWG Meeting 3	01/02/2010	Environmental Effects on Byrrill Creek Dam by Joanna Gardner Community Survey Report – Water Options by J.Morrison	
		Environmental Assessment Council Land by Peter Parker Rhonda James letter to the CWG Caldera Environment Centre - NO DAM No Dam by Sam Dawson	
CWG Meeting 4	15/02/2010	Presentation by Jenny Pearson (Social Effects on Families inundated by proposed Byrrill Creek Dam) Presentation by Malcolm Bailey (Effect of Living Below a Dam Wall Construction Site) Presentation by Joanna Gardner (The Social Effects of the proposed dam at Byrrill Creek) (Letters on Social Impacts from R. Hoopman & A McInerny - G Gerrard and J Dawson) (Letter & Statement on social Impacts on Businesses from R & M Ridgeway and P van Lieshout) Presentation by Colleen Edwards Presentation by Sam Dawson Presentation by Eddie Roberts Presentation by Paul Hopkins Presentation by Tony Thompson	
CWG Meeting 5	01/03/2010	Draft Water Sharing Plan Extracts by Joanna Gardner Lance Tarvey NPWS Statement on effects of Dam (supplied by Joanna Gardner)	
		Letter to TSC GM from some CWG members	
		Formal Statement from members of TSC Water Supply Augmentation Community Working Group (CWG)	

B3: List of additional work undertaken

B3.1: By CWG Members

Additional Work by	An Overview of the Byrrill Creek Dam Area by Joanna
	Community Survey Report – Water Options by J.Morrison Environmental effects & Considerations for the proposed Byrrill Creek Dam by Joanna Gardner
	The Social Effects of the proposed dam at Byrrill Creek by Joanna Gardner
	Uki Public Meeting 07.12.2009 – organised by Joanna Gardner
	Uki Public Meeting 27.02.2010 – organised by Joanna Gardner
	Tom Alletson: Values of Byrrill Creek & Impact of a dam at Byrrill Creek
	Formal Statement from members of the TSC Community Working Group CWG Version 5 signed

AN OVER VIEW OF THE BYRRILL CREEK DAM AREA Joanna Gardner

Background On Dam:

- 1977 Reconnaissance Engineering Geological Survey of NSW, & Dept Public Works NSW
- 1978 Geological Survey of NSW, Feasibility investigation on Byrrill & Doon Doon Site
- 1980-1982 Clarrie Hall dam built
- 1983- Caveats placed on affected land in Byrrill Creek from this date.
- 1986 -Council purchases Wades land (1,131ha) at back end of Byrrill Creek.
 - Land leased to Ken Morrow for cattle adgistment
- 1993- Joint NSW Forestry & Council Forestry Plantation on 230ha of the land. Maturity 25-30yrs
- 1998- 2000 Council plants an extra107ha & 56 ha
- 2004- NSW Dept Commerce: Construction of Byrrill Creek Dam & Cost estimate for 16,000ML dam
- 2007- SMEC commissioned to investigate dam at Rocky Cutting, Eungella
- 2007- Byrrill Creek Dam @ 16,300ML costed at \$38.3 million.
- 2009 October- NSW Dept Works (designer of Clarrie Hall Dam) commissioned to look at a larger 40,000 ML dam at Byrrill creek with estimated cost initially @\$51 million, & now @ \$58.4 million

Affects of Proposed Dam:

The dam wall would be located at "Pretty Gully". It would be an earth & rock fill dam with the spillway height at 40 mts high, (contour level 125-130mts) and 50 mts wide. According to the Geology Reports "the site has some severe geological problems, the main one being the considerable depth of weathering on each abutment, High leakage conditions have been encounteredwhich would commit the site to a fully lined spillway. An extensive program of grouting would be required to establish an effective grout curtain"

The catchment area is 53 square km. for the larger dam and The amount of land inundated is 400ha for a 40,00ML dam & 240ha for the 16,000ML dam.

6 dwellings would be flooded, one of them council owned. The dam would affect 24 land owners:14 at Pretty Gully & 10 others. The dam does not just flood Byrrill Creek valley, but also Kunghurloo & parts of Mebbin Springs. Peter Vanlieshout loses approx 1/3 of his land. Access roads to 19 people's property would be affected.

The road west to Tyalgum would be flooded from Pretty Gully & due to terrain and cost, it probably would not be replaced. Many people who live on the Tyalgum end of Byrrill Creek would lose their access to Uki & Kyogle road. Access to Mebbin National Park would be via Tyalgum, or Cadell Rd, the Camp ground would only be accessible via Cadell Rd, not Tyalgum, unless a bridge was built, which is highly unlikely.

Conservation Value of Byrrill Creek:

Byrrill Creek Valley is a biodiverse wildlife corridor that links Terragon, Mebbin National Park, Wollumbin National Park & State Conservation Area, & ultimately Mt Warning National Park.

In 1995/96 the Byrrill Creek Landcare group received funding of \$3,264 for 2 projects, to stabilise & revegetate along the creek banks.

The Tweed Catchment Stressed Rivers Assessment Report 1999, identified the Byrrill Creek subcatchment area as the highest conservation value riparian area within the Tweed, because of its high proportion of riparian vegetation cover, and high percentage of diversity of wet flora species and schedule 1 & 2 wet fauna species.

A further 2 Surveys, Tweed Landcare Ecosure in 2003, and the 2004 Tweed Council Vegetation Management Survey supported this view, rating it as the best ecological condition, & highest biodiversity within the Tweed Shire.

During 2007 to 2009 Byrrill Creek has been part of a Northern Rivers Catchment Management Authority Riparian Rehabilitation Scheme to manage weed infestation, in which 73% of land holders with riparian zones along the creek participated. Total funding was \$350,000

In 2010 Byrrill Creek will be part of the Northern Rivers Catchment Management Authority project, to enhance landscape connectivity, through strategic wild life habitat corridors, using revegetation & rehabilitation of existing native vegetation. Funding for this project is \$63,000.

Total funding for all of the above projects is \$416,264 plus in kind labour contributions of \$154,342 by land care members.

In July 2009 I collated a 45 page Byrrill Creek Wildlife Survey in which 20 property owners & residents participated. 15 species of vulnerable, endangered & threatened species (both State & Federal Acts) were recorded. The Survey also showed that both southern & northern ridges along the valley were most likely core Koala habitat areas & that narrow sections of the creek & road were used as corridors by koalas accessing either hillside. This was also backed up by Rhonda James Koala survey, which is part of the Council's own Vegetation Management Strategy of 2004. Why spend all this energy, time and money to restoring a high quality conservation area to then flood it all?

The Stressed Rivers Assessment Report DLWC 1998 classified Byrrill Creek as category U4, being of low environmental and hydrology stress, due largely to the low levels of water extracted from the creek. Doon Doon Creek, however has water extraction rates that create medium levels of environmental and hydrology stress to give it a stress rating of S4. A dam on Byrrill Creek is therefore likely to create considerable environmental stress as well as the destruction of habitat of the Giant Barred Frog (Threatened EPBC Act), Bush Hen (Amaurornis olivaceus,) (T: EPBC Act) the Powerful Owl (Ninox Strenua) & the Barking Owl (Ninox Connivens) (Both T:EPBC Act) and the numerous Platypus, who have all been recorded living within or close to the creek in the proposed dam catchment area. The dam would also limit Koala migration and breeding patterns.

Community Survey – Water Options

TWEED DISTRICT WATER SUPPLY AUGMENTATION PROJECT

SURVEY REPORTS



DISCLAIMER:

This survey has been commissioned by community representatives to the Community Working Group for their information and has <u>not been commissioned or endorsed</u> by Tweed Shire Council or the Community Working Group examining the Tweed Shire Water Supply Augmentation Project.

PURPOSE:

This community survey is intended to assist nominated representatives to the Community Working Group to better present *all the concerns and issues* of all Tweed Shire residents affected by one or more of the water supply options being considered for the Tweed Shire Water Supply Augmentation Project.

It is also meant to stimulate discussion and consideration for the other alternative options that are still available to help meet the needs of the Tweed Shire in to the future, even though most of these options are not currently being considered.

DATA MANAGEMENT:

Each survey form received has been allocated with a number and each page noted with the same number which corresponds with the 'citizen number' which appears in each of the reports.

The same 'citizen number' relates to a single survey form and results for that number can be cross checked with the original archived survey forms.

REPORTS and RESULTS:

The reports generated represent the <u>raw data</u> of the survey forms and no interpretation is included.

The survey results presented in this document represent the responses of the participants and can be further appreciated by reading individual comments presented in the full *Survey Reports* document.

The reports of the 'Comments' provides additional background context and is partially representative of community concerns and aspirations relating to each question.

DISCLAIMER:

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- 1. Should Tweed Shire retain its semi-rural and village character?
 - Yes 152 **95.6%** No 7 **4.4%**
- 2. Should Tweed Shire have high density development such as in South East Queensland?

Yes	9	5.66%
No	148	94.3%
Unanswered	2	1.25%

3. Should the population of the Tweed Shire be planned to double by 2036 (in 27 years)?

Yes	17	10.7%
No	133	83.64%
Unanswered	9	5.6%

4. Should the population of the Tweed Shire be planned to be limited to suit available water supplies?

Yes	145	91.2%
No	11	6.9%
Unanswered	3	1.88%

5. Should the population of the Tweed Shire be planned to be limited to suit environmentally sustainable levels?

	Yes	153	96.2%
	No	5	3.1%
Wildlife habita	ıt	132	83%
Prime farming	land	113	71%
River	health	130	81.7%

6. How important is the environment to you when council makes development decisions?

No Importance	0	0%
Some Importance	7	4.4%
Important	13	8.2%
Very Important	135	84.9%

7. Should council reconsider any other water supply management options?

Yes	143	90%
No	3	1.88%
Unanswered	13	8.2%

8. Which other options do you think has merit for further consideration?

	<u>Number your o</u>	rder of p	<u>reference</u>
New dam at Rocky Cutting on Oxley River	Yes	14	8.8%
	No	103	64.77%
	Unanswered	40	25.15%
Artesian groundwater supply	Yes	22	13.83%
	No	94	59.11%
	Unanswered	43	27.04%
Pipeline link to Rous Water at Ocean Shores	Yes	23	14.46%
	No	90	56.6%
	Unanswered	43	27.04%
Pipeline link to SEQ Water at Tugun	Yes	20	12.57%
	No	95	59.74%
	Unanswered	43	27.04%

Desalination, sea water	Yes	27	16.98%
	No	98	61.63%
	Unanswered	43	27.04%
Desalination, ground water	Yes	13	8.17%
	No	103	64.77%
	Unanswered	43	27.04%
Recycled direct use	Yes	106	66.66%
	No	30	18.86%
	Unanswered	24	15.09%
Recycled indirect use	Yes	118	74.21%
	No	10	6.28%
	Unanswered	19	11.94%
Stormwater harvesting	Yes	134	84.3%
	No	7	4.4%
	Unanswered	18	11.39%
Funded domestic rainwater tanks	Yes	152	95.69%
	No	1	0.6%
	Unanswered	6	3.8%
Usage reduction technologies	Yes	140	88%
	No	3	2.0%
	Unanswered	15	9.4%

Dry composting toilets	Yes	136	85.5%
	No	8	5%
	Unanswered	14	8.8%
Other methods	Yes	55	34.6%
	No	4	2.5%
	Unanswered	100	62.9%

9. Would you use recycled water?

(a)	For drinking	Yes No	62 70	39% 44%
(b)	Household use; washing, toilets	Yes No	132 13	83% 8.2%
(c)	For gardening and other	Yes No	145 3	91.2% 1.9%

10. Are you responsible for the management of land that is affected by one of the proposed dam options?

Yes	51	32%
No	95	60%
Riparian Conservation	26	16.3%
Landcare	18	11.3%
National Parks	7	4.4%
Timber plantation	0	0%
Streamwatch	8	5%
Aboriginal	1	0.6%
Tourist site	6	3.8%
Other user	13	8.2%

11. Are you a tenant on land directly affected by one of the proposed dam options?

Yes	18	11.3	
No	131	82.4%	

Residential lease	8	5.0%
Farming lease	4	2.5%
Other lease	5	3.0%

12. Do you own land that is directly affected by one of the proposed dam options?

Yes	35	22%
No	112	70.4%
Unanswered	10	6.3%
Clarrie Hall Dam	5	3.14%
Byrrill Creek Dam	30	18.9%

13. Have you been approached by council to sell them your land?

Yes	4	2.51%
No	115	72.32%
Unanswered	38	23.89%

(a)	Are you familiar with NSW State Legislation?		
<i>E.g.</i>	g. Land Acquisition (Just Terms Compensation) Act		
Yes	18	11.32%	
No	64	40.25%	
(b)	Have you so	ught legal advice?	
Yes	1	0.62%	

45.28%

14. How much of your property will you lose?

72

All	6	3.77%
Half	1	0.62%
Third	0	
Quarter	2	12.57%
Less	17	10.69%

No

15. How much of the affected area is productive farmland?

All	3	18.86%
Half	1	0.62%
Third	0	
Quarter	6	3.77%
Less	15	9.43%
Unanswered	131	82.38%

16. Which type of farming activity is affected?

Livestock	4	25.15%
Small crops	10	62.89%
Orchards	5	3.14%
Timber	1	0.62%
Other	6	3.77%

17. Is a tourism activity affected on your property?

Yes	5	3.14%
No	42	26.41%
Unanswered	111	60.81%

18. Is wildlife habitat affected on your property?

Yes	36	22.64%
No	31	19.49%
Unanswered	78	49.05%
Koala	29	18.23%
Platypus	29	18.23%
Wallaby	30	18.86%
Other	25	15.72%

19. Do you record wildlife sightings in a diary?

Yes	27	16.98%
No	75	47.16%
Unanswered	55	34.59%

(a)	If not, would you be willing to start recording sighting		
Yes	46	29.55%	
No	25	15.72%	

20. Will primary vehicle access roads to your property be affected?

44	27.67%
50	31.44%
63	39.62%
41	25.78%
11	6.91%
6	3.77%
20	12.57%
5	3.14%
	 44 50 63 41 11 6 20 5

21. Will service access roads within your property be affected?

Yes	23	14.46%
No	65	40.88%
Unanswered	85	53.45%
Minor changes	4	2.51%
Major changes	10	6.28%
Total replacement	4	2.51%

22. Will electricity supply lines need to be relocated?

Yes	12	7.54%
No	71	44.65%
Unanswered	76	47.79%

23. Will telephone cabling need to be relocated?

Yes	18	11.32%
No	63	39.62%
Unanswered	78	49.05%

24. Will buildings need to be removed or relocated?

Yes	12	7.54%
No	68	42.76%
Unanswered	92	57.86%

Dwelling	6	3.77%
Shed	5	3.14%
Other	0	

25. What construction related activities will impact on your amenity?

Machinery noise	57	35.8%
Blasting	55	34.6%
Dust	57	35.8%
Large trucks	73	46.0%
Night construction	46	29.0%
Traffic delays	67	42.0%
Dangerous traffic conditions	64	40.2%
Loss of access	48	30.2%
Closure of roads	63	39.6%
Road damage	71	44.6%
Disrupted water supply	29	18.2%
Disrupted power	25	15.7%
Disrupted phone	31	19.5%
Unanswered	77	48.4%

26. How do you find the proposals affect your feelings on the following?

(a) Permanent loss of wildlife habitat due to dam construction

Relaxed, no concern	9	5.6%
Some Importance	5	3.1%
Concerned	21	13.2%
Very Concerned	84	52.8%
Stressed, impacting health	29	18.2%
Unanswered	13	8.1%

(b) People displaced from homes for dam construction

Relaxed, no concern	6	3.7%
Some Importance	11	6.9%
Concerned	32	20.1%
Very Concerned	74	46.5%
Stressed, impacting health	21	13.2%
Unanswered	16	10%

(c) Divisions within the local community

10	6.2%
12	7.5%
32	20.1%
69	43.3%
20	12.5%
19	11.9%
	10 12 32 69 20 19

(d) Anxiety for your family's future

27	16.9%
22	13.8%
34	21.3%
39	24.5%
18	11.3%
23	14.4%
	 27 22 34 39 18 23

(e) Uncertainty for land use planning

Relaxed, no concern	19	11.9%
Some Importance	11	6.9%
Concerned	40	25.1%
Very Concerned	50	31.4%
Stressed, impacting health	20	12.5%
Unanswered	21	13.2%

(f) Uncertainty for property values

39	24.5%
24	15.0%
32	20.1%
29	18.2%
15	9.4%
	 39 24 32 29 15

The survey results presented in this document represent the responses of the participants and the context of the results can be further appreciated by reading individual comments presented in the full <u>Survey Reports</u> document.

Community Survey – Water Options

TWEED DISTRICT WATER SUPPLY AUGMENTATION PROJECT

<u>condensed</u> SURVEY REPORTS



WATER OPTIONS SURVEY REPORTS © 2010 Author; J. Morrison, PO Box 3074, Uki, NSW, 2484

DISCLAIMER:

This survey has been commissioned by community representatives to the Community Working Group (CWG) for their information and has <u>not been commissioned or endorsed</u> by Tweed Shire Council or the Community Working Group examining the Tweed District Water Supply Augmentation Project.

The options proposed by council are;

- 1) Raise Clarrie Hall Dam
- 2) Build Byrrill Creek Dam
- 3) Connect to SEQ via pipelines
- 4) Connect to Rous Water via pipelines, construct bore field

PURPOSE:

This community survey is intended to assist nominated representatives to the Community Working Group to better present *all the concerns and issues* of all Tweed Shire residents affected by one or more of the water supply options being considered for the Tweed District Water Supply Augmentation Project.

It is also meant to stimulate discussion and consideration for the other alternative options that are still available to help meet the needs of the Tweed Shire in to the future, even though most of these options are not currently being considered.

REPORTS and RESULTS:

The reports generated represent the summary of the <u>raw data</u> of the survey forms and no interpretation is included.

The survey results presented in this document represent the responses of the participants and can be further appreciated by reading individual comments presented in the document.

The reports of the 'Comments' provides additional background context and is partially representative of community concerns and aspirations relating to each question.

Question 1 -

Should Tweed Shire retain its semi-rural and village character?

Yes **95.6%** No **4.4%**

- Beauty is in the rural 'nature' of region. Tweed still functions; Murwillumbah already hard to park in work hours.
- Population growth is unavoidable, though with planning it can be achieved
- That's why we're here
- · Development turns Tweed in to another Gold Coast
- And plant or regenerate more rainforest
- The low key character is important to the communities preferred values. See councils Strategic Plan 4/24
- The Gold Coast is a tourist destination based around theme parks. We don't want that to happen here
- Because it is much nicer like it is now than being a huge city.
- I believe that this area should be left as it is.
- Retain scenic landscape important.
- The last large survey done under Lynn Beck as Mayor, said village style development & I don't think that has changed. I like Nightcap Village when they supply their own water.
- That's the appeal and that's why tourists come here. Salt & Pepper are a disaster and an eyesore. Keep things on a small scale, NOT Mega Club Med style (no thanks tacky tacky.
- 160,000 or 250,000 will spoil this area. There is not enough parking in Murwillumbah now and certainly not enough water.
- Its precisely why I moved here and over the last 30 odd years have seen vast changes one dairy farm left out of four between Uki and Murwillumbah. Tweed coast is fast becoming the urban sprawl - houses fill the house blocks with no space for gardens.
- This is what attracted us back into the area.
- It's the reason I came here for.
- The charm of this area is what brings tourism here.
- One of the reasons people choose to settle in this area is the distinctive character of small villages nestled amongst the dramatic scenery. Another is the excellent agricultural produce - if we over develop (thousands of houses squashed on to tiny blocks) we will not be able to a) produce enough food for the population and b) maintain the distinctive character of the Tweed Valley and caldera.
- · That is what Makes the Tweed Shire what it is.
- The biodiversity of the Tweed Shire deserves to be left to the wildlife.
- Its one of the things that makes the area attractive and a lovely place to reside in.
- There are not many areas left like the Tweed and we need to preserve and maintain what we have.
- Few people want Tweed to become Gold Coast. Even fewer want to pay costs for developing new housing for developer driven housing boom.
- As long as possible.
- · Needs planning laws and council policies to this effect,
- Soft sensitive village atmosphere maximum 2x stories on buildings.
- That is why we moved here
- Please
- · It makes for more sustainable living including community sustainability
- Why I live in the Shire.
- In parts that are rural urban expansion is not a problem foe me. (Terranora, Tweed Heads)

Question 1 -

Should Tweed Shire retain its semi-rural and village character?

Yes **95.6%** No **4.4%**

- Definitely This will be a selling point for tourism.
- Definitely that's why we live here, and why tourists spend big dollars in our Shire.
- Why not like Trentham in Victoria; eco-friendly housing, we could set a great example.
- Quality, not quantity , most important!
- it should, but it won't.
- Most decidedly
- Absolutely, why else would we live here.
- That what make this area unique
- Yes, west of Murwillumbah. East, south-east & south-west. It will preferably need to grow.
- But I do realise that many people want to live in suburban areas on the coast.
- Yes, high density mass housing developments are inappropriate, this is the country side.
- I bought land here 59 years ago, why do you think I have stayed ?
- This is suited to surrounding natural environment.
- This is a wonderful community in which to live and I believe it is due mostly yo its semi-rural and village character.
- It offers diversity in lifestyles and lifestyle choices.
- Its true value.
- Uki and Byrrill creek are beautiful areas, please respect and honour that.
- Allows space to return to being human !
- Definitely, this is the only way forward, in a world subject to climate change.
- But this question is a little out of date. Just look around you at Murwillumbah, Pottsville, Kingscliff, Banora Point, Tweed Heads West.
- That's why the residents chose to live here.
- As much as is possible, however population growth has to be catered for. With hopefully better results than the Tweed Coast debacle.
- For as long as possible.
- · In the areas which still have this character
- It is one of our major assets.
- Major tourist attraction of the Shire.
- There is ample high density urban development elsewhere for those who want it.
- Absolutely yes, Tweed
- Perhaps some low-key tourist development, but one-story only and is keeping with the local heritage flavour!
- It's why we are here
- It is this character that makes it unique. Tweed Shire should NOT be destroying this for urban sprawl.
- Yes, this is the reason we the newcomers, came to live here. It also the reason tourists come. It needs to be preserved.
- There is already dense development pockets around the coast and Banora / Terranora etc.
- · Eco-centric development is voluntary simplicity in design and in practice
- Absolutely. It is part of the reason that makes this area so unique

<u>Question 2 -</u> Should Tweed Shire have high density development such as in South East Queensland?

Yes 5.66 % No 94.3 % Unanswered 1.25 %	
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- · Not enough water now. Must ensure adequate waTer-wise solutions in place first.
- Have we control in cinjunction with State Planning Policy? POWER BACK TO LOCAL COUNCIL
- That's NOT why we're here
- · We don't want more development as it conflicts with conservation of the environment and wildlife habitat
- OK for Tweed
- Any new development e.g. Kings Forest/ Cobaki/ Rise should be self-sufficient with water e.g. 20,000 litre tanks.
- There are enough huge developments
- Our beautiful environment will be destroyed if they clear the land for housing etc.
- No farther than Tweed Heads
- Unsustainable, lose quality of life. Wildlife moves on.
- Keep high density north of Tweed River. No development on Fingal Spit.
- No thank you.!
- We don't need another Gold Coast here. Maybe Tweed Heads and Tweed Heads South could get bigger multi-storey
 - as they are already commercial centres. Keep coastal and rural areas simple (that's the appeal) Evolve naturally.
- We came to live here in peace and value rural lifestyle.
- Our farming land should be retained not developed. New estates should have 1/4 land as green belt, trees, recreational areas.
- Such a development is incongruous with this area
- As above we have seen how the urban sprawl has obliterated the landscape and made the Gold Coast just another conurbation with no distinctive character. A ghetto in the making.
- Natural devastation that will be un-repairable.
- · Definitely not, this would bring huge negative impacts in this massive sacred zone
- I should think that there is enough of that sort of thing already and probably too much so.
- We need to work towards a more sustainable environment and go for low density development.
- The ecology of the valley is too fragile too much risk of pollution of the water going through Murwillumbah
- High density brings traffic congestion, pollution, breakdown of social cohesion would destroy our lifestyle. The
 community should be polled before that direction decided. The ecology of the valley is too fragile, too much risk of
 pollution of the water.
- Absolutely not
- Management of natural resources and the public estate should be the focus not old chestnuts such as 'high rise' and 'low rise' development.
- Develop regional centres e.g. Lismore Kyogle Murwillumbah
- No, no, no, no.
- Not what I came to experience i.e.; high density.
- In appropriate urban areas and properly planned not row after row of townhouses or apartment blocks.

<u>Question 2 -</u> Should Tweed Shire have high density development such as in South East Queensland?

Yes	5.66%	No	94.3%	Unanswered	1.25%
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- No, we are running out of buildable land and we won't have the infrastructure in place for high density.
- No. Too many of these already
- It shouldn't , but it will.
- · Nothing wrong with development carried within the guidelines that take in the environment
- There is too much of this already.
- We need to keep the uniqueness of this area.
- Yes, east of the freeway only.
- In specific areas not in rural village areas.
- High density mass housing developments are designed as un sustainable. Mandatory sustainability should be legislated for all new mass housing developments.
- A BIG NO ! What work would there be for people ?
- · High density should be restricted to pre-existing high density areas to restrict land use.
- I disagree with dense population because of the effects on the environment.
- Absolutely not. Tweed Shire is unique and should be kept so. But we need to stop urban sprawl as well.
- Definitely not ! Too much traffic and crime.
- Not necessary at all. Less work more time to live.
- NO WAY ! This is a very significant area. Many flora and fauna in this area are only found here. We need to ask ourselves, what will we leave for our children and theirs.?
- Maybe. If only to house future population growth which I am afraid is inevitable. Look at the damage done by single dwellings on a greater amount of land.
- That's why the residents chose to live here. If you want to live in high-density development, there are other options available.
- But only around Tweed Heads. Tweed Coast has already been developed enough. Obviously population will increase
 here but planning needs to be managed better.
- · But it already has at Tweed and Bilambil heading south.
- Who wants another Gold Coast ?
- It will be unsustainable in the future and create costly social problems.
- Need to differentiate Tweed from Gold Coast.
- Definitely not. The Gold Coast is always held up as the example for how NOT to allow development.
- We already have enough development as it is, and high-rise would be ugly and out of character, and we don't have the water to sustain this.
- Appalling thought people, traffic, pollution, shops galore selling rubbish.
- We are destroying so many nplaces, leave this as a quite backwater.
- Generally no. Perhaps in very small pockets like Tweed Heads if necessary, so the rest of the Shire can be low density or more areas left in a natural state.
- Ugly, Unsustainable and environmentally unfriendly
- Nobody wants it. That's why we live here !

Question 3 - Should the population of the Tweed Shire be planned to double by 2036 (in 27 years)?

Yes 10.7% No 83.64% Unanswered 5.6	Yes	10.7%	No	83.64%	Unanswered	5.6%
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- Need GREEN employment (not retirees) as high unemployment area
- If we have to. Where do the 'projections' come from and commissioned by who?
- Unrealistic drain on services and sustainability
- We should limit population growth
- Where is it going to double? I assume it will double current built up areas.
- Should be based on environmental/ social carrying capacity
- No, we need to conserve the Tweeds beauty so our children and grandchildren can enjoy it too.
- While population increase is inevitable, this should not be to the detriment of what makes Tweed Shire uniquely beautiful and important environment for native plants and wildlife.
- If we allow our communities to grow we become like cities and soon there will be next to no places such as this in America.
- Slow down growth in line with infrastructure.
- Especially Kings Forest and Cobaki very bad.
- In the last 22 years I've been here, I have seen the population grow exponentially, especially the last 8 years, so I
 would not be surprised to see population double in 27 years time. So infrastructure should be planned; water, power,
 roads, transport etc. Smart planning (climate change).
- Why is bigger always better? (The council view). There is not the space, water, public facilities, food growing areas to support this. It's greed of developers, corruption of State government and local council that is driving this.
- Coastal region are not places for population growth. Unless you want to be swimming out your windows.
- To preserve our biodiversity and ecology, we need more trees less people.
- If this means that the Shire won't cater for sustainability for environment and socially (i.e. sufficient access to leisure areas for children) then NO.
- What is the 'carrying capacity' of this region in terms of water availability, food production, social services etc? We could
 possibly accommodate another 20,000 but must remember that the population of Tweed Shire has already doubled
 in the past 30 years and that we are already straining to provide services such as health, education, public transport,
 social services etc to the population that is here now ... let alone water, good quality food. Environmental amenity etc
 (one example is that we used to be able to grow oysters at Terranora, but the inlet is too polluted now.)
- Don't know, it depends on what is decided and acted upon now!
- Sub-division of rural blocks would destroy this area.
- We don't want big business taking over to comply with the population boom.
- I don't think a doubling of population will be a good thing See Q1.(Its one of the things that makes the area attractive and a lovely place to reside in.)
- Do not know what the population is of the Tweed, but it needs to be on a sustainable and environmentally concious level.
- Careful. Self sustainable developments are a MUST.
- No reason to allow this. Planners need to consult the residents and not allow this abomination. If they want the Gold Coast - let them move there.!
- Environmental and population growth pressures will inevitably bring population increases abd this should be planned for - but not actively sought and encouraged.
- Population growth should not be the focus of either State or local Government policies .. See 2 above.(Management
 of natural resources and the public estate should be the focus not old chestnuts such as 'high rise' and 'low rise'
 development.)
- · Protect the coastline and river banks and wetlands.

Question 3 - Should the population of the Tweed Shire be planned to double by 2036 (in 27 years)?

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Yes 10.7% No 83.64% Unanswered 5.6%
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- Some growth is inevitable but not that much.
- Not sure of the demographics but population growth should only be of the sustainable type and LOW DENSITY
- People have to live somewhere. I think it's unlikely to happen as we don't have a big industrial base or anything to
 employ these people.
- Definitely not. With hospitals and roads already under pressure we can't cope with the people we've already got.
- Who makes these decisions? Any consultation?
- But it will
- Places can be too loved, everyone wanting to live here. Soon becomes just another overpopulated area. Tweed Shire
 is majic, please keep it that way. Let's make it a special place people can enjoy when they visit, but limit population.
- This is evolutionary development in line with the rest of the country. Other\people are entitiled to live here just as much as the person who designed this survey.
- Depends population should be limited to available resources (not solely water)
- Why must the population always increase? The current Government policy of immigration and baby bonuses is flawed and short sighted.
- The demos will require it, and again, in Murwillumbah and east of the freeway.
- Sustainability is an issue with any population increase. The Far North Coast Regional Plan is that there is significant population increase.
- Would they all be on the dole ?
- I believe this will not be sustainable unless consumption is cut back by 2/3.
- However if this is the anticipated growth for the Shire then appropriate infrastructure should be planned for.
- Having said that, I don't know how you can control population growth other than to restrict development so there are few homes and housing for increase in population.
- Environmental impact, inadequate services to support that increase of population.
- · Growth is inevitable and it would be wise to be prepared.
- Definitely not ! Too much traffic and crime.
- Not necessary at all. Less work more time to live.
- the only development here should be Eco: for the future.
- But it already has been as we all know to 160,000. After 2036 a change may take place.
- This is a very large country spread out a bit.
- It's taken well over 100 years to get to present population level and doubling that number in less than one quarter of the time would seem to be a very sharp increase.
- · Hopefully not.
- · We all need to live somewhere.
- Antiquated thinking. Need to plan for stable population.
- Not sustainable
- Australia's population is rapidly escalating, but I doubt that the prediction is for a doubling within 27 yrs. We should keep pace with the average, but not wildly exceed it.
- Yes if it reduces excessive urbanization elsewhere. No if not.

Question 3 - Should the population of the Tweed Shire be planned to double by 2036 (in 27 years)?

Yes	10.7%	No	83.64%	Unanswered	5.6%
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 Stay ir 	the big cities.				
 Please mair 	e let us ensure ntained and tha	though that t general	at organic - culti environmental c	ure gardening be stror common sense be kep	ngly encour ot.
 No, the 	ere needs to be	e a popula	ition cap, not on	ly here but worldwide.	
• This d	oes not seem s	sustainabl	e.		
 Insufficiency 	cient infrastruct	ture and w	vater		
 How m boor 	any habitats o n propaganda	f eco serv model feti	ices get elimina ish.	ted so a fresh McMan	sion can ta
• It's a li	kely scenario.				

<u>Question 4 -</u> Should the population of the Tweed Shire be planned to be limited to suit available water supplies?

Yes	91.2%	No	6.9%	Unanswered	1.88%	
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- Need two things: Sustainability directives and water-wise sensitive design
- With urban water tank schemes. We DO need to expand admitted. But there ARE other options. Be creative. Look around (Web)
- Far more sustainable
- If people want to use 200 litres of water each per day, they shouldwalk to the closest creek and carry it back on their heads, just to appreciate it.
- · Should be limited to allow healthy river flows that provide for an abundant
- There is room for more efficient water use e.g. use of recycled water and capture of storm water.
- Suburban enclaves should be self sufficient in water needs. Make recycled water available.
- People building granny flats would be easier on the sewerage and the water supply.
- Tweed Shire should look after its own in regards to water. If we have a bumper year of rain, then we could sell excess
 after creek/rivers flushed. Tweed Shire water infrastructure plans should be limited to local domestic use and not
 planned for profit to sell specifically to other areas outside Tweed Shire.
- Set population limit to 100,000. No more population developments.

<u>Question 4 -</u> Should the population of the Tweed Shire be planned to be limited to suit available water supplies?



- Any new developments should in their DA's be self sustaining each house to have underground tanks, grey-water recycling, storm water harvesting set up for the whole development.
- This makes sense.
- Also to retain farming land and forest, habitat etc, Trees bring us rain.
- I think there is great potential for Tweed Heads to lead the way amongst regional centres to incorporate sustainable technologies (i.e. solar, wind) There is great community potential to be harnessed.
- I am a farmer (amongst other things) and when planning stock numbers and what to plant one of the vital considerations is the availability of water for our animals and market garden in a dry series of years (such as 2001-2004). Why would planners consider doing otherwise when it comes to human 'carrying capacity' ?? Surely this would be extremely foolhardy and downright irresponsible.??
- That seems sensible
- Tweed Shire has enough water for its locals.
- Makes sense
- Absolutely as we do not want to encourage more dams etc.
- The whole planet need intelligent planning not greedy ones. The Tweed valley also.
- Absolutely, planned release of building allotments can regulate growth so no dramatic shortages occur.
- Also see 2 & 3 above. (2- Management of natural resources and the public estate should be the focus not old chestnuts such as 'high rise' and 'low rise' development.. 3 - Population growth should not be the focus of either State or local Government policies .) Caution here - easy enough nowadays to supply water through better resource use and new technology for much larger population.
- · And other facilities e.g.; public roads, amenities.
- Anyone with a brain would say yes.
- And new dwellings have evry H2O saving device i.e.: at least 10,000 litre tanks, grey-water recycling, low H2O appliances.
- · As should the entire Nation 25 million cap as exists?
- Council planned the Byrrill Creek Dam in the 1980's to cater for expansion in to already approved subdivisions at Terranora creek. Not necessarily lower than planned, just well planned. !
- Yes, of course, it's not rocket science.!
- Unless each household harnesses own water supply.
- Logic!
- As above (3) Places can be too loved, everyone wanting to live here. Soon becomes just another overpopulated area. Tweed Shire is majic, please keep it that way. Let's make it a special place people can enjoy when they visit, but limit population.
- Expand water supply at the Micro not the Macro level
- Just like it was not limited before the Clarrie hall was built.
- Essential, surely.!
- Sustainability
- This is the only environmentally friendly way forward.
- Or increase the water supplies.
<u>Question 4 -</u> Should the population of the Tweed Shire be planned to be limited to suit available water supplies?

Yes	91.2%	No	6.9%	Unanswered	1.88%	

- Not a Police State
- But how?
- So far the Tweed Shire has put the cart before the horse.
- Unless all homes are required to have their own rainwater tank and consumption is cut back to less than half.
- Increased water storage should be planned for. Dams, rainwater tanks (these can become acidic and need to be monitored.) Taking the water underground etc.
- Absolutely. Water is a finite resource. I used to think it was a renewable resource but with climate change no more.
- Responsible actions that support the health and wellbeing of environment and community.
- Ultimate limiting factor.
- It is common sense to live within your means. Credit does not extend to the environment.
- Its common sense, there is no other way.
- My humble opinion in this survey will not affect the world order need for overpopulation. This is the question, the answer is not popular It's a whole Earth approach for 1 child per family.
- That makes sense.
- With climatic change or variation water supply will most likely need to be augmented.
- Tweed shire has plenty of water available.
- And all other infrastructure.
- The population of Tweed (and elsewhere) all need to reduce their water usage.
- Antiquated thinking. Need to plan for stable population.
- Absolutely.
- YES
- Obviously, everywhere should be planned to suit available water supplies.
- Communities are capable of collecting their own water ie: individual dwelling collection and storage and water management systems should be introduced as mandatory building regulations.
- This is a practical solution.
- Current available supplies and allow all households to utilize tank water.
- Smart forward planning

Question 5 –

Should the population of the Tweed Shire be planned to be limited to suit environmentally sustainable levels?

•	Yes	96.2%	No	3.1%		
Wildlife habitat	83%	Prime farm	ing land	71%	River health 81.7%	

- Medium to high density development is unsuitable for this area. High Biodiversity value and agricultural farmland is a much needed community resource
- · Because this cannot be replaced! Once again, be creative, and use other options
- One of the last refuges on the planet
- Farming is for vegetables not livestock which is polluting and wasteful of water
- Especially to increase the depleted fish stock levels, a food source, that everyone has right to, but must be carefully nurtured.
- Leave the Tweed green.
- Planning increases must be contingent on infrastructure capacity, environmental sustainability and social amenity.
- Tweed River can't take anymore sewer plant overflows.
- What about the hospitals, Police, mental health facilities? Small blocks will breed delinquents, what about the people living in these awful mini-cities? Put too many chooks in a pen and they will peck each other.
- All river, creek, and main gullies should have wildlife corridors / wild vegetation 20 metres each side for water quality
 and wildlife corridors. Grazing and agricultural land should stop being worked when slopes become too steep and let
 natures vegetation grow from there upwards.
- All creeks / riparian areas should be planted out for animal corridors, erosion control etc. Also socially sustainable medical services, hospitals, etc which are already pushed to the limit.
- Needs to be discussion of the fact that conventional agriculture is on a technological treadmill and therefore economically compromised. Sustainable agriculture may evolve more from a gardening base. Population needs to have adequate land in which to small farm garden.
- The weed Shire has an opportunity to preserve our ecology and improve our rivers. A role model Shire will always have thriving tourism and the planet needs it as do the people on it.
- · People are enthusiastic to protect their environment in all these things.
- Above all, we must preserve the character of this region in order to sustain development into the future. As the climate changes, we need to buffer the existing population against potential disaster (Bushfire, flood, crop failure, storm surge all take their mental and physical toll). Talking with long term residents (from generations of Tweed farmers), one soon realises the importance od landscape and emotional wellbeing.
- · Valley of contrasts
- Council should be aware of the sustainable levels of the shire. Any shire!
- Too much good farm land already goes to development, not only around here but across the whole country.
- Absolutely, we need to reserve our flora and fauna, waterways, wildlife habitat.
- All the above this valley is a gem, lets keep it that way.
- This area is an important wildlife corridor and needs careful conservation.
- With 3 world heritage National Parks, enhancement of biodiversity values and natural systems, in conjunction with sustainable human use would be an alternative way of saying this.
- We all should be eating local produce.
- And the well-being of the people who live here.
- See as above. (Anyone with a brain would say yes.)
- Clarrie Hall Dam maintains flows in the river at times it would otherwise not flow. The dam is better for wildlife.!

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Question 5 –
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Should the population of the Tweed Shire be planned to be limited to suit environmentally sustainable levels?

Yes	96.2%	No	3.1%	
Wildlife habitat 83%	Prime fa	arming land	d 71%	River health 81.7%

- Of course, it's all interconnected and if one thing fails, we all fail.
- Unless built sustainable housing e.g.; mud-brick, straw-bale etc.
- Again, logic.
- This area is of World heritage significance, let's prove we can be guardian of this wonderful area and therefore have the right to live here. Tweed Shire needs to be managed with great care and respect.
- Only suited to a yes vote.
- Environmental sustainability needs to cover all aspects of the community. There are other aspects here to also
 consider.
- Anything else would be suicidal.
- Where appropriate, population growth is a reality.
- Most people didn't live here 30 years ago move out the dole parasites.
- Whose idea of sustainable ?
- Any and every new mass housing development must be sustainable, by legislation and planning consent.
- · Families worked hard to make a living and life was simple.
- It depends on the type of farming.
- I don't think we can afford to think in a way that isn't wholistic. Sustainability means taking into account everything about our environment including plants and animals.
- Credit does not extend to the environment.
- All of the above, No wonder everyone wants our water, but it is limited as we are seeing this year (very dry conditions). Blue-green algae in our rivers very early in summer. So why take more water from them.? It makes no sense at all. Its just a quick fix. Many bushfires locally also.
- As above (My humble opinion in this survey will not affect the world order need for overpopulation. This is the question, the answer is not popular - It's a whole Earth approach for 1 child per family.)
- However this question neglects a very important point 'Human Needs'.
- They should all be kept in mind while planning.
- Need for small acreages hobby farms, eco tourism.
- Our rivers are living ecosystems. The health of the land and its occupants depend directly on the health of the waterways.
- Prime farming land: currently on the Tweed, we produce sugar on beautiful river loam soils. This land could be utilised
 to produce the tweeds food requirements. Bring on community gardens and education to support every capable
 resident to grow food! People of all ages and abilities are able to participate in food production in some capacity- if
 they knew how.
- The rainforests/forests/waterways/coast of the Tweed Valley are host to the second highest biodiversity levels in Australia, something so rare needs to have threatening processes (ie human impacts) limited so remaining habitats can be kept as intact as possible. Rampant development causes habitat fragmentation, a leading cause of species decline and extinction due to the lack of genetic diversity in the small, isolated, surviving pockets of habitat.
- Development of small community managed food gardens is essential.
- Too late for the Kunghur community. All of the above will be damaged by the Mebbin Springs & Kunghur developments. It is pointless to plan for unsustainable development.
- It's time to set a precedent with the DA's

Community Survey - Water Options

<u>Question 6 -</u> How important is the environment to you when council makes development decisions?

No Importance 0% Some Importance 4.4% Important 8.2% Very Important 84.9%

- This region is valuable for its biodiversity and could be a 'food bowl' for Gold Coast & SE Queensland.
- It is what the main tourism is based on (and will be more reliant on)
- Most important
- Our biodiversity needs a lot more protection
- · This rainforest environment is vital to our planets survival
- · Healthy fish stock levels are a right for all, especially aboriginal community.
- · We need to wake up and save the environment
- It should not be up to a minority group to make decisions for the whole community which affects our environment as a whole.
- There needs to be environmental impact studies even when there is a proposal for small seemingly insignificant changes.
- Council needs to make representations to State to change/ upgrade BASIX and sustainability criteria.
- · Never compromise environment, all life is precious not only humans.
- · Where is the damn koala plan of management for the coast?
- All major development decisions should be transparent and made public and with public input. Main industry here is the tourist industry, who come here for beautiful natural scenery and beautiful tranquil beaches.
- Community consultation is of the utmost importance but the council is so pro-development that they ignore submissions
 e.g. Nightcap Village, Kings Forest. Katie has pushed for sustainable developments but always voted against by the
 majority of councillors. Koala management plan is still not in place.
- We live in one of the most beautiful environmental and culturally diverse areas in Australia if not the world. We need to protect this area, it is important especially for the future and the effects of global warming!
- If there is no environment, eventually there is no economy.
- I would like the council to listen to its people.
- A dam is a destructive band-aid which will have a detrimental effect on everything downstream. We have the knowledge and technology to adjust to new ways of living e.g. solar, composting, recycling, awareness, tanks.
- To quote Al Gore: 'There is no economy without environment'. It's that simple, stupid! i.e. we cannot sustain development without considering it's impact on the environment.
- Not just council, but everyone else also
- We all need the simple things in life. Our environment is important not only for us but the children of the future.
- Should be first priority
- This council doesn't seem to think the environment important apart from a couple of recently elected councillors
- As it is the reason why we moved here to get away from urban sprawl and enjoy this beautiful area we live in.
- Council must establish a set of binding principles that guide 'development decisions'. Again, development, although still the vernacular term, should not be language of choice. See previous notes.
- This whole area is environmentally important to maintain
- For all the obvious, known and well canvassed reasons.
- Planning guidelines are quite strict already I'm happy to believe Council staff if they either approve or deny development applications.

<u>Question 6 -</u> How important is the environment to you when council makes development decisions?

No Importance	0%	Some Importance	4.4%	Important	8.2%
	Ve	ry Important	84.9%		

- We want to live in a clean healthy environment. This would also attract tourism.
- It's vital to maintain a clean and green Shire.
- Consultation needed every time.
- Trying to preserve and improve what we have.
- When will we learn respect for the environment and her part on this planet. Without her we can not survive. I want my
 grandchildren's grandchildren to experience what we have been fortunate to experience. Think globally, act locally !
- This planet supports us cover it in bitumen, concrete and housing at our peril.
- It is one of the significant characteristics of the 'Green Cauldron'.
- Coastal development decisions don't seem to have considered the environment at all, so far.
- Council development decisions often dismiss environmental concerns and are development rather than environment biased.
- How we treat the land now will affect it in future.
- Conservation of natural habitat and environmental equilibrium of existing forest reserves is essential to the planets future.
- If we kill our environment we kill ourselves.
- I can't tell you how ugly the Salt & Pepper developments are in comparison to the pristine bush that used to be there. All the water sustaining grass lawns. The environment is critical.
- For too long have we made development decisions based solely on economic rationale. It is far too obvious that this is not sustainable.
- Top priority.
- If we do not look after our environment/ habitat, we won't have one ! Then what ? We need to make some very smart decisions for long term, not just a quick fix !!
- The environment nurtures us, we should nurture it.
- In recent past, Council has wrecked Tweed Coast.
- It should always be considered.
- We must stop taxing the future and live compatibly with our environment.
- A healthy environment underpins economic sustainability.
- It is a PRIMARY concern of utmost importance.
- The environment is the most important issue, we won't go far without having a healthy environment to support us.
- No environment, no economy.
- We have a unique rainforest area in this region, and it is very important for the ecological health of this region.
- Imperative. Council is gatekeeper. The councils failure to recognise the detrimental effect of these developments to the quality of life for the residents should not continue.
- Its time the council took the lead to protect the environment.
- In this day and age it is more important then economic concerns.
- Council doesn't have any eco-philosophers amongst any of its multi tiered levels of corporation technicians.
- Absolute importance

<u>Question 7 -</u> Should council reconsider any other water supply management options?

Yes 90% No 1.88% Unanswered 8.2%	
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- Catchment management initiatives & grey-water/stormwater/wastewater recycling and harvesting composting toilets etc
- Rainwater tanks should be part of the Building Code
- I reiterate be creative, look further afield for more options (stage 3)
- Every residence has rainwater tanks and composting toilet options
- I cannot think of any other
- 3 tanks, tank walls localised rain water collection
- Larger water tank mandate
- New technologies developed in abundance these days these should be investigated to minimize depleting the river flows
- Recycle water, at least for toilet, clothes washing & gardens. Subsidise water tanks so that more people always mean more water available
- Water tanks and recycled water for all new developments.
- Vital especially composting loos and larger tanks.
- Compulsory water tanks for all people with town water.
- Recycle water, use rooftop water, harvest, filter and store drain water, .Water tanks on every urban hill.
- Population cap.
- Raising Clarrie Hall Dam would double water supply with less land loss rather than a new dam.
- \$51 million dollars would buy a lot of 40,000 gallon tanks and dry composting toilets
- Recycled direct (see below) Population cap.
- More rain water tanks, recycled water.
- A dam should be the last resort.
- Options! How many water tanks and/or dry composting toilets can be supplied downstream for the cost of money available for Tweed water augmentation?
- Option five sounds great, tanks on all roofs and recycle all waste water.
- They are called water tanks they use big ones at the Currumbin Eco Village.
- Absolutely!
- At least start by assessing the potential for how water tanks on every house and all major buildings i.e. schools, shopping complexes.
- Unfortunately I was not able to make it to the 7th December meeting at Uki. One option that is simple to institute and
 very effective is to insist that all new developments have dual reticulation onsite grey-water re-use, piped alongside
 the potable water supply and built into every house. For developments such as Seabreeze this would mean a
 wetland onsite to clean and harvest the stormwater and grey-water generated by the development.
- Why not work with what already exists.!!
- Yes city water management, rain tanks etc.
- Extra water supply
- A new dam at Byrrill Creek.
- There are plenty of common sense options to pursue other than more dams etc. rainwater tanks, recycling grey-water etc.

<u>Question 7 -</u> Should council reconsider any other water supply management options?

Yes 90% No 1.88% Unanswered 8.2%

- Maybe increasing Clarrie Hall dam. Encourage grey-water re-use for instance we should not be flushing drinking water down our toilets. Go composting. Go back to water tanks, etc.
- · Consider water harvesting, storage and use options, not just 'supply'.
- Everyone should have water tanks large.
- Recycling
- Recycled water, larger tanks for town. Compulsory large tanks for all new industrial sites.
- Much more recycling, harvesting and storing of our mostly abundant water.
- Subsidise all homes (in the Shire) tanks, pumps & plumbing.
- The short list gives adequate choice. They should build the Byrrill Creek Dam as planned for 20 years.
- Don't know what other options?
- Tanks for all new houses as a BASIX requirement. 2) Harvesting water off the roofs of public buildings.
- Each house water harnessing.
- Desalination, recycle
- Recycle water Singapore water tastes good.
- Household rainwater tanks encouraged and subsidised increasing cost to reduce water consumption.
- Micro level, use a water filter to filter. Minimum 5,000 gallon domestic H2O tanks for potable water.
- All supply options should be on the table for comparison, including; recycling and expansion of tanks in use.
- The most sustainable.
- Dams are controversial and are the best way to augment supplies. Encourage more use of rainwater tanks.
- New dam at Byrrill Creek
- Recycling wasted water.
- Especially option 9, which was dismissed as 'unproven in Australia', even though it is in extensive use in Europe and Asia.
- Natural increase, human, animal.
- We live in a land of drought and flooding rains, instead of letting the water run out to sea channel it underground in to existing bore water.
- Rainwater tanks, water reduction devices, localized treatment of water fed back into local areas.
- Domestic under garden cisterns.
- Anything that is sustainable and ecologically sound.
- Dry toilets, recycled water, tanks, common sense not driven by big business.
- There are always alternatives.
- There are a number of options outlined below that deserve consideration. However I would be happy to see Clarrie hall or Byrrill Creek Dam. And I am a Byrrill creek resident.
- Definitely the size of water tanks in all new houses.
- Rainwater tanks (Maybe underground)
- Byrrill Creek
- Need to consider all demand (population) and supply issues (e.g. recycling)

<u>Question 7 -</u> Should council reconsider any other water supply management options?

Yes	90%	No	1.88%	Unanswered	8.2%	
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- Recycled water from sewerage. All buildings including commercial and industrial should be forced to save water and use it for toilets, gardens, cleaning etc. There should be much greater emphasis on REDUCING CONSUMPTION..
- Of course
- Most definitely. Mass storage in dams is too costly to the environment and an unnecessary central control over water collection and management
- Limit population growth so there is less demand for the water.
- Tank restrictions should be phased out in the medium term.
- Recycle water, educate people to conserve water, dry compost toilets, tanks for collection on every roof domestic and commercial.
- No Dams more rainwater tanks and grey-water systems.
- Water Tanks
- Council is part of the non-solution. Council, the best mediocrity money can buy.

Question 8 -

Which other options do you think has merit for further consideration?

1.	New do	m at Rocky	Cuttin	g on Oxley Rive	r	
	N	0.0 <i>m</i>	NT			25 150
	Yes	8.8%	NO	64.77%	Unanswered	25.15%
2.	Artesia	n groundwat	ter sup	ply		
	Yes	13.83%	No	59.11%	Unanswered	27.04%
3.	Pipelin	e link to Rou	ıs Wate	er at Ocean Sho	res	
	Yes	14.46%	No	56.6%	Unanswered	27.04%
4.	Pipelin	e link to SEQ	2 Wate	er at Tugun		
	Yes	12.57%	No	59.74%	Unanswered	27.04%
5.	Desalin	nation, sea w	ater			
	Yes	16.98%	No	61.63%	Unanswered	27.04%
6.	Desalir	nation, groun	ıd wate	er		
	Yes	8.17%	No	64.77%	Unanswered	27.04%
7.	Recycle	ed direct use				
	Yes	66.66%	No	18.86%	Unanswered	15.09%
8.	Recycle	ed indirect us	se			
	Yes	74.21%	No	6.28%	Unanswered	11.94%
9.	Stormy	vater harvest	ing			
	Yes	84.3%	No	4.4%	Unanswered	11.39%
10.	Funde	d domestic ra	inwate	er tanks		
	Yes	95.69%	No	0.6%	Unanswered	3.8%
<i>11</i> .	Usage	reduction tec	hnolog	gies		
	Yes	88%	No	2.0%	Unanswered	9.4%
<i>12</i> .	Dry co	mposting toil	lets			
	Yes	85.5%	No	5%	Unanswered	8.8%
<i>13</i> .	Other i	methods				
	Yes	34.6%	No	2.5%	Unanswered	62.9%

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<u>Question 8 -</u> Which other options do you think has merit for further consideration?

- Reaforrestation Planting thousands of trees in/around catchment to increase rainfall restore FULL rain cycle & mitigate climate change impacts.
- Large rainwater tanks are the only holistic and integrated option which doesn't abuse the land.
- · Recycled water, not for drinking thanks
- · Reduction of livestock farming which uses almost half total water supply
- Plant more rainforest they are our rain makers. More tanks per household.
- Theory per Janis Birkeland Positive Development Urban Design initiatives e.g. water tank wells, green scaffolding,. We know how to make rain these days, we must plant rainforest trees.
- London has lower rainfall. Decades of recycled water use, no ill effects.
- All waste water where practical (storm water, treated sewerage, etc) should be recycled for agriculture, industrial use, gardens, domestic cleaning etc. Two taps - clean and recycled water taps. Large factory roofs, all roofs should collect water in tanks.
- Desalination uses too much power, greenhouse emissions etc, toxic brine waste. Indirect recycling in their plan is
 pumped all the way back from Kingscliff to Clarrie Hall Dam It's ridiculous, it should be on site.
- All agriculture changed to biodynamic in order the soil becomes more friable and accepting of water. Dept Agriculture study by Small & McDonald to be examined in this regard.
- I would consider recycled water in gardens for sure.
- 7 = Education
- Community education is imperative to support reduction.
- · All BUT new dam or ground water options
- Just upgrade Clarrie Hall, infrastructure already standing and area already adapted to dam, large paddocks rather than bio-diverse flora and fauna areas that really need full protection in such a fragile area.
- Static population no real increase (as doubling) in population growth for 10 20 years.
- Teach water conservation. Ban use of reticulated water for some non-essentials, like cleaning footpaths and paved areas. Introduce a sliding scale of charges for water use - exponential after a certain threshold is reached. Reducing waste and leakage will save a high %.
- Start with the options circled 'Yes' above; limit water hungry industry. Look at dams, desal and ground water as longer term contingencies.
- Why raise the issue of artesian supplies? Have you spoken to Stella Wheildon re this?
- Opportunity to be more self sufficient each household.
- FULLY funded tanks. We already have some usage reduction technologies.
- Items; b,h,j,k are already available, in use, or can be if a person wants them. If grants for tanks from Federal or State government grants.
- Council and Government should be demanding that the responsibility be put back on the house hold.
- FREE domestic rain water tanks.
- Should provide water for the Shire from within Shire borders.
- Re; (c & d,) Can they spare the water? (i) If a way can be found to do this economically.(I) Where feasible.All water is recycled anyway.

<u>Question 8 -</u> Which other options do you think has merit for further consideration?

- Refer; a, c, &d) I do not know enough about these to comment.
- Re option of Byrrill Creek Dam or raising Clarrie Hall Dam ?
- Artesian groundwater, only if it is plentiful.
- · Compulsory domestic rainwater tanks. Dry composting toilets in country areas only (acreage)
- Limited development in accordance with climate change. Whole new LEP to take into account climate change, would be cheaper in long run.
- Council must now go back to the listing of options process, include other options (a new Option 5 Wise Water Use) and allow community input into the selection of the shortlist.
- Limit the intake of people to workers. Excuse bad writing I have broken wrist.
- Mass reduction of consumption.
- I don't have a full understanding of the effectiveness etc of some of the above implementations.
- I'm lacking education in this topic and need to research the options listed above.
- Tanks at houses.
- I don't fully understand the implication of each suggestion.
- Desalination done correctly. Tanks on houses, integrated cisterns in all new slabs compulsory.
- Dams are not the answer. It's a short term solution and just adding to our environmental problems when you look at the big picture. People have to be more responsible with our precious water usage. South East Queensland needs to become more accountable and use other methods of water collection NOW, not wait until the next drought, like the last one in 2003 -04 !!
- Using expensive treated water to flush toilets is the most ridiculous usage imaginable !
- High density housing should pay for added water usage. Infrastructure cost shouldered by profit making developers.
- Educate consumers add the cost of water rises, these options will become economically viable.
- Artesian source robs surface water. Options g,h,l,j,k,&l These are complimentary, should ALL be implemented.
- Desalination should not involve power from a polluting source i.e. coal fired.
- We need much greater emphasis on reduce, reuse & recycle. If we have to have a larger public water storage area, then the only acceptable solution is raising the wall of Clarrie Hall Dam. Definitely no pipelines or new dams, and leave the artesian basin alone.
- Too many variables and unknowns to answer these questions.
- Maybe as Clarrie Hall Dam is already there we should raise the dam whilst fixing the wall.
- More education starting in preschool.
- Europe and other developed countries have been recycling domestic water for years. Change the NSW Government rules on size of water tanks domestically. They need to be bigger.
- · Surely the money used for building dams could buy a lot of rainwater tanks.
- Council isn't ethically equipped to be involved in these matters. Every drop of water is a Deity. Teaching children to
 respect water like a God is where it all starts.

Community Survey - Water Options

Question 9 -

Would you use recycled water?

(a) (b)	For drinking	Yes	39% 83%	No No	44% 8.2%
(b) (c)	For gardening and other	Yes	91.2%	No	0.2 % 1.9%

- Prefer to catch rainwater for personal & domestic use Rainwater tank, (Supplement with Mineral Colloids)
- Recycled water has been used in hospital theatres in Canada for decades
- Others can, so can we
- Water has memory
- Recycled water is being used in Qld with no problems.
- I have a rain water tank, when this empty I buy drinking water.
- Technology exists, consequences are known, no problems.
- No confidence that recycled drinking water plant maintenance is done properly. One failure and we all get poisoned. I
 think any new major developments should have this water.
- Great idea!
- All of the above.
- I'm not sure about drinking recycled water yet.
- Unproven health risks
- Toilet composting should be compulsory.
- I grew up in the UK on 'recycled' water. What's the problem? As a rural landholder, I have lived on tank and spring water for decades. Recent research published in the MJA shows that tank water is fine for human consumption.
- So much water just goes to waste in cities, the mentality really sux !!
- Rainwater tanks with appropriate filters for drinking water. Recycled water (household recycling) for other uses. There is nothing wrong with recycled H2O as long as it is safe.
- Rainwater for drinking. We have a 1000 litre tank for drinking in 25 years we never ran out of drinking water.
- I am prepared to use recycled water for ALL uses assuming treatment and monitoring are adequate.
- All water, everywhere, has been recycled over and over.
- Recycled water would be cleaner than the blue-green algae we're drinking at the moment. I would rather use recycled water than what we do now.
- If I had to, but prefer not due to all the chemical processes to 'sanitize' it.
- Suitably treated waste or stormwater is fine for non-potable uses.

Community Survey - Water Options

Question 9 -

Would you use recycled water?

(a) For drinking Yes	39%	No	44%
(b) Household use; washing, toilets Yes	83%	No	8.2%
(c) For gardening and other Yes	91.2%	No	1.9%

- As in London.
- This has been going on in Japan for 50 years. Why are we so backward ?
- Would use for drinking, dependant on process used.
- If this option is feasible (economically, environmentally, scientifically) then it should be imposed and not offered as an option. (Remember Toowoomba)
- I use rainwater for drinking now.
- Not sure for drinking.
- For years I lived in areas using recycled water and cannot understand why people are so against it.
- Toilets and garden only
- I use tank water.
- I am confident there are contemporary technologies that are way effective and efficient producing clean water. All
 water runs through natural cycles like recycling.
- If done well and THAT is possible.
- For the masses. No need to ever use myself.
- PLEASE NOTE: all water on this planet is recycled, we have not had any new water for millions of years.
- It is only suitable for toilets and gardens.
- Would you ?
- Recycled water should be the norm for domestic, business and industry. It is crazy that we don't consider recycled
 water from sewerage. The science and technology is there, and governments should focus on public education, not
 pander to dysfunctional psychological YUK factors.
- I don't need to. That doesn't mean others might need to
- I personally have no need to use recycled water. I collect all the drinking water I consume in tanks and solar pump dam water for my garden.
- This is common sense. Yes, the issue of finer water integrity come into consideration.
- Used in the UK no problem.
- Why not ? The technology is there to clean it.
- Water is already recycled by nature.
- Maybe drinking.
- If you were stranded on a desert island (Australia) and over used your water urine drinks will be the new coca-cola.

<u>Question 10 -</u> Are you responsible for the management of land that is affected by one of the proposed dam options

Yes	32%	No 6	0%		
Riparian Conservation	16.3%	Landcare 1	1.3%	National Parks	4.4%
Timber plantation	0%	Streamwatch	5%	Aboriginal	0.6%
Tourist site	3.8%	Other user	8.2%		

- Lots of money and hard work gone in to regeneration
- But I do go along this creek for picnics and wildlife

<u>Question 11 -</u> Are you a tenant on land directly affected by one of the proposed dam options?

Yes	11.3	No 82.4%		
Residential lease	5.0%	Farming lease 2.5%	Other lease	3.0%

•Shouldn't matter

Managers

•Wish I was so if it goes ahead I could just leave !

<u>Question 12 -</u> Do you own land that is directly affected by one of the proposed dam options?

Yes	22%	No	70.4%	Unanswered	6.3%
Clarrie	Hall Dam	3.14%		Byrrill Creek Dam	18.9%

- Have Crams Farm
- · Would lose a quarter of land
- We are downstream of Clarrie Hall Dam but are not aware of any CHD proposed modifications.
- Flood control not a good thing I live down stream.
- · Not this time until some twit decides to add Rocky Cutting Dam
- What does 'directly' mean? My land won't be flooded but my access to Uki and Lismore will be cut and two-thirds of my 'bush fire escape routes' will be gone.
- Pretty Gully Co-operative

- I live on the river at Murwillumbah, we are all connected.
- We are managers of this property and encourage other water management options.
- As for question 10.
- Devastation / outrage !
- Downstream. back into the whole ridiculas scheme.
- Do not believe in anonomous survey: Colin Gorrel, Clarrie Hall Dam, C/- Uki Post Office.2484. Phone: 0266 799137
- Resident Pretty Gully. I think Byrrill Creek Dam is a good idea.

<u>Question 13 -</u> *Have you been approached by council to sell them your land?*

	Yes	2.51%	No	72.32%	Unanswered	23.89%	
(a)	Are you fam	iliar with NSV	W State Le	gislation? (E	.g. Land Acquisition (Ju	ıst Terms	
Compe	nsation) Act 1991)						
	Yes	11.32%	No	40.25%			
(b)	Have you so	ught legal adv	ice?				
	Yes	0.62%	No	45.28%			

- Will be seeking legal advice if need be
- Not directly relevant to us (to date)
- Not directly affected.
- Council never seems to carry out procedure by the book any more ?
- We've all seen 'The Castle' and under 'Just Terms Compensation".
- I may be wrong but they tell me council pays all legal fees.
- I would seek further advice if the need arose.

Question 14 -

How much of your property will you lose?

All	3.77%	Half	0.62%	Third	0.00%
Quarter	12.57%	Less	10.69%		

- No advice has been given by council
- None
- 20ha Our most useful community shared land will be lost.

- 30 acres All river flats and level open land.
- 1 acre
- None No water inundation.
- None
- Not affected
- None
- Selling out.
- As I understand it, Pretty gully Co-op would have a small amount of land resumed. I assume we would be fairly compensated.

<u>Question 15 -</u> How much of the affected land is productive farmland?

	All	18.86%	Half	0.62%	Third 0.00 %	6
(Quarter	3.77%	Less	9.43%	Unanswered	82.38%

- None
- It is the best open and level land that could be put under crops.
- 1/4 acre
- None
- 300 acres
- This is a private nature reserve these days.

Question 16 -

Which type of farming activity is affected?

Livestock	25.15%	Small crops	62.89%	Orchards	3.14%	
Timber	0.62%	Other	3.77%			

- Gardens
- A family of six live in the house on the property.
- None
- Not affected
- None. Blue-Green algae increase, this time the powers that be should monitor all surface runoff of the catchment for fertilizer, salts, chemicals etc.
- None at Pretty Gully

<u>Question 17 -</u> Is a tourism activity affected on your property?

	Yes	3.14%	No	26.41%	Unanswered	60.81%	
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- Mebbin campground won't be accessable any more.
- Bed & Breakfast.
- Not affected
- Thank God !

Question 18 -

Is wildlife habitat affected on your property?

	Yes	22.64%	No	19.49%	Unanswered	49.05%	To
Koala	18.23%	Platypus	18.23%	Wallaby	18.86%	Other	15.72%

- All animals that live in or near Byrrill Creek
- 5 sq kilometres Having grown up in Byrrill Creek till 12 years old and moving back 1 year ago, I would say wildlife
 has tripled in the catchment area since reafforestation.
- All of them, There is no place for them to eat, breed, mate, etc.
- It would be if land were acquired, but question is not relevant to our situation
- Black cockatoos, damming will drown a large percentage of native trees thus limiting food sources. Green tree frogs have already become very rare which is a sign that the environment is changing.
- Wildlife will use my non-flooded land as a refuge and will compete with the resident populations both will suffer.
- Water level severs wildlife corridors, threatened frogs and platypus lose habitat.
- Many hundreds of species.
- Platypus live in the lagoon where the dam wall is to be built. Koalas cross the creek to access south side of the valley near dam wall. The Giant Barred frog lives along the creek. (Threatened species)
- 7 acres, Protected frogs, snakes, lizards, bird life.
- My property is a narrow acre that runs along the creek. Kingfisher and tortoise live on the creek. Brush turkey and bower bird live on the property.
- Huge, With a dam of this gross enormosity, the wildlife for miles will be affected. What about 'World Heritage'?
- All native wildlife will be affected since we border world heritage corridors within the dam site vicinity.
- All
- Bandicoot, sugar gliders
- Raising Clarrie Hall will have minimal damage to this area as initial dam building did cause damage.
- All wildlife must be affected.
- Seasonal creek flow will be affected.

Community Survey - Water Options

- I feel for the people in the areas of the proposed dam sites and the stress that they are going through as we experienced the same 03 -04 with the proposed Rocky Cutting Dam option. This option was one of the most ridiculous options ever been considered and thank goodness it was squashed, after much rallying and discomfort for the entire community. When will you guys learn there is no quick fix. Climate change is HAPPENING and we need to change our ways. Stop this crazy building spree and water wastage. Go green, its not just for hippies, its our future and the sconer we get used to it the better our future may be. And yes, we will have to make some sacrifices, but smaller sacrifices made now are better than sacrificing our future survival and health on this planet.!
- All of the above an a lot more. Platypus survive, others retreat. Some is flooded and other habitat is increased.
- I believe after initial riverine disturbance, wild life in Byrrill Creek would benefit if a dam was built.
- Damming rivers radically affects river flow. We do not know enough about the complex ecosystems to know the full
 effects.
- All wildlife corridors will be effected between the forest on the south side of the dam and the north. Even though we will be about 4km from the dam I'm certain it would affect the territorial boundaries of some species that at present can roam everywhere and at present have benefits to their health and survival.

<u>Question 19 -</u> Do you record wildlife sightings in a diary?

	Yes	16.98%	No	47.16%	Unanswered	34.59%	
<i>(a)</i>	If not,	would you be w	villing to sta	art recording si	ightings?		
	Yes	29.55%	No	15.72%			

- There was a koala in a tree near my house 2 nights ago, platypus in Byrrill Creek
- I would be willing to record and take photos because some animals are rare and endangered species.
- Refer to Byrrill Creek Fauna/ Flora survey.
- We observe the movement of wildlife regularly.
- I don't live there it's rented.
- A tenant in my house made recordings.
- Our State is losing its National Icon (the Koala)
- Not in a rural area
- Too many to count.
- 38 years.
- Leaving property soon, moving elsewhere.

<u>Question 20 -</u> Will primary vehicle access roads to your property be affected?

	Yes	27.67%)	No	31.44%)	Unanswered	39.62%	, o
	Public 1	roads	25.78%	D	Private	roads	6.91%		
Minor change	es	3.77%		Major o	changes	12.57%	Total replac	cement	3.14%

- New roads will have to be constructed. This will damage more of the environment.
- New roads will disturb even more habitat.
- If we are lucky.
- Flooding to our public road access.

Community Survey - Water Options

- Not living in that area
- I understand Doon Doon and Commissioners Creek Roads need raising if Clarrie hall Dam wall is raised.
- It will become a dead-end road, being shorter in length than it is now.

Question	<u>n 21 -</u>	Will service a	ccess ro	ads within	your property	be affected	?
	Yes	14.46%	No	40.88%	Unanswered	53.45%	
	Minor changes	2.51%	Major	changes 6.2	8% Total rej	placement	2.51%

- Total restructuring of the property's road system will be required.
- Parts replaced by council.
- My entire property will be flooded if the dam goes ahead.
- Not within, but to and from
- No replacement. The Shire will be buying the whole property.
- This was taken into consideration at time of development Application for Pretty Gully Co-operative.

<u>Question 22 -</u> Will electricity supply lines need to be relocated?

19%	
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- We are on Solar Power and tank water only
- I don't have mains electricity.
- At front of property affecting 5 residences.
- Solar
- Have never had 240volts to the farm.
- Not sure.
- Unlikely
- No power supply here.

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Question 23 -
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Will telephone cabling need to be relocated?

	Yes	11.32%	No	39.62%	Unanswered 49.05%	
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- Don't know.
- Off the grid
- Digging up roads for new cables will be too costly.
- I think so
- But no worries, I will be compensated on price of landline cable.

- Most likely.
- Unlikely
- Not sure.
- It'll be drowned at the bottom of Pretty Gully if it hasn't been dug up by then.

<u>Question 24 -</u> Will buildings need to be removed or relocated?

Yes	7.54%	No	42.769	%	Unanswered	57.86%
Dwelli	ng	3.77%	Shed	3.14%	Other	0.00%

- I would personally love to see this house returned to its original state and maybe even used as a museum.
- Dismantling and relocating is not possible. Too labour intensive and costly.
- Gardens and vegetable production.
- 2 dwellings.
- An old building at front of property, no big deal.

<u>Question 25 -</u> What dam construction activities will affect your amenity?

Machinery noise 35.8%	Blasting 34.6%	Dust	35.8%
Large trucks 46.0%	Night construction	29.0%	
Traffic delays 42.0%	Dangerous traffic cond	itions	40.2%
Loss of access 30.2%	Closure of roads	39.6%	
Road damage 44.6%	Disrupted water supply	18.2%	
Disrupted power 15.7%	Disrupted phone 19.	5%	
Unanswered 48.4%			

- Everyone on the way to and from town will be affected
- How are we meant to live when there is a mining site down the road?
- Not to mention that I will be forced to relocate.
- Would need to move away during construction, though looting and security issues would prevent this.
- Byrrill Creek
- Don't know?
- Any dam construction impacts on our regional CO2 emissions and loss of environmental amenity. It therefore affects my wellbeing and amenity.
- · We will have better roads after construction of new dam

Question 25 -

What dam construction activities will affect your amenity?

- All roads will be fixed at end of construction and will be better
- Roads will improve
- All of the above will impact on residents adjacent or near dam construction.
- None
- None of the above
- Any road work will affect my B&B and venue.
- None of above.
- Not sure about disrupted water, power or phone.
- None
- All above.
- Increased heavy traffic on Kyogle Road. It's bad enough now.
- I don't know, possibly the above.
- All above
- Unsure.
- All of above.
- We live near one of the proposed sites but our land would not be directly affected, but we would be indirectly.
- Increased road noise.
- All only temporary.
- How many tonnes of material would be used on the wall ? Where would it come from ? How would it get there ? Dams take up to five years to build (small)
- None
- I would not be able to access bush walking in Mebbin National Park or enjoy the use of it.
- No, not live near the proposed dam site.
- Loss of recreational opportunities and visually offensive. Removal of wildlife habitat.
- · Again and again progress needs to be about refining this process called voluntary simplicity

Question 26 -

How do you find the proposals affect your feelings?

(a) Permanent l	oss of wildlife	habitat due to dan	n construction
Relaxed, no conc	ern 5.6%	Some Importance	3.1%
Concerned	13.2%	Very Concerned	52.8%
Stressed, impacting h	ealth 18.2%	Unanswered	8.1%

(b) People displ	aced fi	rom hom	es for dam constru	iction
Relaxed, no conc	ern 3	.7%	Some Importance	6.9%
Concerned	20.	1%	Very Concerned	46.5%
Stressed, impacting h	ealth	13.2%	Unanswered	10%

(c) Divisions wi	thin th	e local c	ommunity		
Relaxed, no conc	ern (5.2%	Some Importance	7.5%	
Concerned	20.	1%	Very Concerned	43.3%	
Stressed, impacting h	ealth	12.5%	Unanswered	11.9%	

	(d) Anxiety for your family's future					
	Relaxed, no concern		16.9%	Some Importance	13.8%	
	Concerned	21.3%	Ver	y Concerned	24.5%	
Str	essed, impacti	ng health	11.3%	Unanswered	14.4%	

	(e) Uncertainty for land use planning					
	Relaxed, no concern		11.9%	Some Importance 6.9%		
	Concerned	25.1%	V	ery Concerned	31.4%	
St	ressed, impactin	ng health	12.5%	Unanswered	13.2%	

(f) Uncertainty for property values						
Relaxed, no c	concern	24.5%	Some Importance	15.0%		
Concerned	20.1%		Very Concerned	18.2%		
Stressed, impacti	ng health	9.4%				

Question 26 -

How do you find the proposals affect your feelings?

- Promote small dams on farms, tanks and conservation When will we learn BIG DAMS ARE NOT A FEASABLE OR VIABLE OPTION?
- Holistic and integrated what could be more holistic than rainwater tanks shire wide. Mandatory building codes for water tanks
- it may not affect me personally (i.e. own land), but ultimately the decisions will affect the entire community.
- Byrrill Creek must not be dammed or we will all be damned.
- Aren't we meant to get a say in what happens? What happened to the voice of Australian people?
- I live in Tyalgum.
- Not 'very concerned' very angry slaughtered wildlife, unsustainable human population, development, mad council, profligate water use.
- Could impact health in future if anxiety increases.
- Due to current NSW Labor government legislation developer caps, we will be paying an extra \$32 million at the moment. Wish one of you would ask Max Boyd why he OK'ed all this population growth as Administrator.
- To see this valley and peoples' homes flooded, land bulldozed, wildlife habitat destroyed would be heart breaking.
- The thought of a dam going in at Byrrill Creek brings feelings of anxiety and uncertainty to most residents. Respect for landowners choice of lifestyle is very important.
- Thanks for asking about feelings.
- I wish council would just give up the idea.
- I feel a sadness that council would even consider a dam with Mt Warning being 2nd to Kakadu for the diverse ecology.
- Dams are old technology and ultimately will always fail to provide for out of control population numbers. I refer back to my comments about 'carrying capacity'. We should completely exhaust all other avenues before investing dollars which would be more economically spent elsewhere on dams. I have not done the maths but am reasonably certain that charging what water is worth would help to reduce consumption and obviate the need for another dam. Community education has limited growth of water consumption in the Brisbane City Council area why not take a leaf out of their book? Lastly, I wish to re-iterate my main point: onsite grey-water re-use should be mandated in every new development. Dual reticulation works: make it easy for householders and businesses by supplying it from word go. Thank you :).
- About time for Council to start listening to the people + respect the wildlife.
- It seems these dam proposals are for future nuclear devastations. Tell us the truth.
- New dam at Byrrill will improve the area and provide better for the future with water availability. Clarrie Hall dam has
 provided better water for todays usage we need to be better prepared for the future.
- Will improve property value. A dam at Byrrill Creek will improve our Tweed Valley water supply.
- The Clarrie Hall dam was built successfully by Tweed Shire Council. A new dam at Byrrill Creek can be done in the same way and provide better for the future !
- Apart from 2 councillors, this current council should hang their heads in shame. They're a big disgrace and don't care
 about residents, only their own personal gain and profit ! Who voted them in again after being sacked once before ??
 I cannot believe it, it defies credulity.
- I don't live close to dam but I'm an inhabitant of the Tweed valley. It's the best place on the planet.!
- Another 'water option' to consider in any future planning for the Shire is rising sea levels over the next decades. Therefore all development should be confined to areas 10 metres above current sea level and which then impact the hill country and problems with roads, erosion, slippage etc will arise. It's all going to look very different in 50 years time folks.!
- Excellent survey congratulations.

Question 26 -

How do you find the proposals affect your feelings?

- d,e,& f no concern because I am not located near Byrrill Creek site or Clarrie Hall Dam. I would have great concerns re Byrrill Creek also trucks etc, traffic through Uki for either option. Another factor is huge cost involved of either option. Capture, recycling etc would have to be more cost effective.
- PS: Urban dweller one rule rain that falls on your land is yours ! = harvest it !
- Thanks for all your effort!
- This survey is 'development focussed' NOT environment, very disappointing.
- Dams are unfortunate but necessary reality. Water may become more scarce, especially when the population increases.
- As my home is located in the Uki village without more knowledge on the impact of projects in this area, I cannot
 ascertain the effects on the village.
- I think the best option, if we must build / expand existing dams would be Clarrie Hall. But keep the water in the Tweed Shire. South East Queensland needs to cater for their own needs and if they were smart, it should have been organized by now, not crying poor every time there is a drought. This causes a lot of stress for rural NSW / Tweed and it should not be our problem. !
- A man is created for happiness, that happiness is within him, in the satisfaction of simple human needs and that all unhappiness arises not from privation but from superfluity.
- Is there a plan for flood free access to construction site ? New bridge at river, Cedar Creek etc.
- In the future, water will be one of the most valuable resources. I suspect political greed plus the Nightcap Village development are major motivators.
- ATTITUDES must change and councils need to LEAD the way through example, policy and public education. Farming practices need to change. (For example, a farmer at Bray Park has his paddocks watered by huge sprinklers, undoubtedly drawing hundreds of litres a minute and operating in the heat of the day.) Constructing new dams and pipelines for unconstrained development is irresponsible and unsustainable. The emphasis has to be on reducing our use of water and becoming more self-sufficient. Water may be a basic human right, but not hundreds of litres a day. There should be a certain allocation of 'free' water per person (say 25L per person per day), and excess water use should be prohibitively expensive. Those who live on the land have a greater appreciation of the true value of water, and use far less per person than those who live in the urban sprawl. Building dams to satisfy the wasteful practices of urbanites is wrong. All developments (including renovations) should have water storage commensurate with the surface area of the roof say 5MI for the average house. We should be aiming for majority self-sufficiency.
- John Moran 0407156800 Call if you need to debate any of these issues.

This survey and associated reports have been collated and compiled by John Morrison. Any enquiries, questions or comments can be directed to;

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ENVIRONMENTAL EFFECTS & CONSIDERATIONS FOR THE PROPOSED BYRRILL CREEK DAM

This paper should be read in conjunction with: "An Overview of the Byrrill Creek Dam" J. Gardner

Environmental Effects of the proposed Dam

Impacts would fall into different categories:

- Construction related: Widening or damage to existing access roads & surrounding vegetation, Heavy machinery, cement works, pipes, traffic, noise, air pollution, resource use, green house gas emissions
- Dam wall Site & construction zone: Complete eradication of existing land & river features and destruction of habitat and species.
- The catchment area of 400ha would be clear felled of existing trees & vegetation up to the 125 mt contour mark to ensure water quality in catchment, again total loss of habitat & profound affect on all species
- Inundation of the area; the land lost, and all of the ecological, social, cultural, economic and climate impacts associated with this.
- Hydrological Changes: the impact of water being retained by the dam & the lack of water available to the natural environment downstream with changes to flow rate, frequency and duration and water quality, especially until levels within the dam reached spillway level. At present Byrrill Creek is rated as category U4, being of low environmental and hydrology stress, due largely to the low levels of water extracted from the creek. (Stressed Rivers Assessment Report.)
- The dam wall would be a barrier to fish, eels, platypus, turtles and other aquatic species & interrupt migration and breeding patterns
- Species that live within the riparian zone, from insects, to frogs, platypus or vegetation along creek banks, would have to adapt to new conditions, but many may not be able to.
- Erosion downstream could be exacerbated by the dam wall, as it would prevent natural migration of silt downstream during floods & heavy rains.
- Looking at the larger environmental picture of the Upper Tweed River, if a dam was built at Byrrill Creek, it would mean 2 dams in adjacent catchments on this stretch of the river, which is already rated S3: High Hydrological stress & Medium Environmental stress (Stressed Rivers Assessment Report.) The reduced flow into the upper catchment of the Tweed would further degrade the quality of an already stressed river.

The Byrrill Creek Sub catchment has been the subject of 8 Assessment Reports/ Projects

- 1. Flora & Fauna Assessment of 100ha for TSC for Reafforestation. Parker 1998
- 2. Stressed Rivers Assessment Report (August 1999) Tweed Catchment, NSW Land and Water Conservation
- 3. Environmental Assessment of Selective Harvesting for TSC Forestry Plantation. Parker 2000
- 4. Tweed Riparian Restoration Prioritisation Report (2003) Ecosure, Burleigh Heads
- 5. Tweed Shire Vegetation Management Strategy (2004)
- 6. NRCMA Byrrill Creek Riparian Rehabilitation Project 2006
- 7. PAS Key Corridoor Connections Project 2009
- 8. A local Byrrill Creek Fauna & Flora Survey compiled by J. Gardner 2009

There has been no complete Fauna & Flora Assessment of the proposed dam site. Parkers Surveys of Council owned land were of limited areas compared to the 1,0131ha owned. (No 1. was of 100 ha primarily on the southern side of Byrrill Creek road.) Less than 10% of the Council land was surveyed & the flora and fauna reports were quite specific in scope, addressing reafforestation and limited logging. Many of the Surveys above were rapid assessment style, & some are quite dated.

I suggest that there needs to be a new assessment of the entire site commissioned, ASAP, before an intelligent & informed decision could be made by the CWG or the Council about the 4 options.(see enclosed letters from R. James & Peter Parker) I understand that legally, this assessment would have to meet the NPW DECC Threatened Species Survey Guideline.

Threatened Species

The proposed dam site, encroaches on Mebbin National Park to the west, and the area north & north east are bounded by Wollumbin National Park & Mt Warning National Park, which is world Heritage status. There have been numerous assessments done in these adjoining biodiverse parks with a high percentage of recorded Endangered, Threatened or Vulnerable fauna & flora species. An assessment of priority fauna species through the PIA identified 42 priority Flora species & 37 priority fauna species (6 amphibians, 7 reptiles,13 birds,& 11 mammals) Their habitat extends beyond park boundaries along the Byrrill Creek valley which acts as a corridoor linking all the well forested ridges. Much of the ridge vegetation comprises mixed forest of Tallowoods (Koala Primary food Source) and Grey Gums, Flooded Gums, Iron barks, Blackbutts and Forest Oaks (Koala Secondary food Source). Data from Tweed Veg Mapping & the Byrrill survey indicate they are likely core Koala habitat areas.(40 sightings & 5 resident koalas near homes- Byrrill Survey) An intensive 4 month study of the Endangered Giant Barred frog was carried out within Mebbin. Down stream in Byrrill Creek 13 sightings have been recorded, 4 of them within the dam catchment area. These are just 2 examples of many threatened & vulnerable species that would be affected by the dam <u>which indicate a need for a detailed new Assessment of the whole dam catchment.</u>

High Conservation Status

With the exception of Parkers Assessments, which were for specific reasons, all reports classified the Byrrill Catchment area as High riparian Conservation status. This is reflected in total Funding for Riparian projects at Byrrill Creek of \$416,264 plus in kind labour contributions of \$154,342 by land care members.

The area in the vicinity of the proposed dam is comprised of <u>Myrtaceous Riparian Low Closed Forest to Woodland</u> which is classified within a Rainforest category & occurs as a Riparian Community. It comprises a low closed riparian forest to woodland community found in a relatively narrow band fringing creeks or in gully sites within sclerophyll forests. Tweed Veg Management Strategy allocated it a High Conservation Status 2, which is considered rare, comprising less than 0.7% of all bushland, with most of the best examples within Byrrill Creek.

In the Tweed Riparian Restoration Prioritisation Report, of the 6 subcatchments of the Tweed, 86 sites were surveyed & ranked. Byrrill Creek ranked the highest Conservation Value, with an average 70% and Diversity, 79%. Within the top 30 high priority sites, 10 are in the BCk catchment. Most of these sites (except Cedar Creek sites) will be affected by the proposed dam site. Of particular concern is Site Rank 4 (BYBY2), which is within the proposed dam wall construction site & runs 300metres upstream of the dam site. Another site, (BYBY4), ranked as number 1 priority within the Tweed, is approx 800 mts downstream of the dam wall and would be severely affected by reduced water flows of the dam upstream. Further sites downstream would not be as severely affected as Cedar Creek would provide extra water flow. Be that as it may the whole riverine eco system of Byrrill Creek would be affected by the proposed dam. The dam wall site is at the northern end of a beautiful natural lagoon, where daily sightings of platypus occur.

Aboriginal Heritage Sites within the Catchment Area

There are several sites of Aboriginal Cultural significance on the Council land, which would be inundated. It is interesting to note that when "Boodjeragali', an Aboriginal Organisation, applied to Council to look for cultural artefacts on their land in 2002 they were denied access.

Toxicity within the Catchment

<u>Dip Sites within the Catchment</u> There are 2 abandoned Dip sites within the proposed catchment area. The Byrrill Creek Dip at the eastern end of the Council land and the Maybeirne Dip at the western end. Toxic chemicals (many banned these days) may have leached into the surrounding soil and ultimately pollute the water quality if the dam is approved. Uncle Harry Boyd was concerned about the Dips at the Uki Water Options Meeting. <u>Spraying of Groundsel & other weeds</u>

For many years from 1984 council commissioned their land to be sprayed with 24D and 245T, the active constituents of Agent Orange, which would have residual effects in the soil, and affect water quality.

The Bigger Picture

The Byrrill Creek area is geologically part of the inner dyke complex of the Mt Warning Massif. As a World Heritage listed area, scenically beautiful, it comprises the southern side of Wollumbin, a spiritually significant site to the Aboriginal people and to residents who live in its shadow. Residents & tourists could no longer travel in a scenic circuit around Mt Warning as there would probably be no access. A dam would destroy the integrity of the "whole".

Compiled by Joanna Gardner CWG Representative for the Byrrill Creek Area.

Bibliography & References

This Paper was assessed as correct by Mark Kingston, TSC Natural Resource Management, on 19/2/2010 who suggested 2 small detail changes which have since been implemented.

DOCUMENTS SUPPLIED TO THE CWG

Flora & Fauna Assessment of 100ha for TSC for Reafforestation. Parker 1998 Environmental Assessment of Selective Harvesting for TSC Forestry Plantation. Parker 2000 Tweed Riparian Restoration Prioritisation Report (2003) Ecosure, Burleigh Heads

DOCUMENTS SUPPLIED (4 VOLUMES) BY TWEED SHIRE COUNCIL Tweed Shire Vegetation Management Strategy (2004)

DOCUMENTS AVAILABLE IN PDF FORMAT FROM BUSHLAND RESTORATION SERVICES NRCMA Byrrill Creek Riparian Rehabilitation Project 2006 PAS Key Corridoor Connections Project 2009.

PDF FORMAT AVAILABLE FROM THE INTERNET:CATCHMENT MANAGEMENT AUTHORITY Stressed Rivers Assessment Report (August 1999) – Tweed Catchment, NSW Land & Water Conservation

AND ALSO A 45 PAGE local Byrrill Creek Fauna & Flora Survey J. Gardner 2009,

SOCIAL EFFECTS OF THE PROPOSED DAM AT BYRRILL CREEK

Pl ease Note: This Paper should be read in conjunction with complete Results of the Community Water Survey which including some landholders at Clarrie Hall. However the rest of this paper relates to Byrrill Creek Dam area only

INUNDATION:

6 dwellings will be inundated, & 15 residents on Byrrill Creek Road will need to relocate. 2 families will not be compensated due to caveats placed on the original DA's of the land. From TS Council figures the Council will need to compensate 12 affected property owners & calculate 35 residents are affected, however on Pretty Gully alone 37 people are affected & I estimate at least 56.

Water Survey Results:

Quest 12; 22% own land directly affected by dam Options: 18.9% Byrrill creek, 3.14% Clarrie Hall. Quest 11: Tenants on land directly affected by dam =11.3% Farming Lease=2.5% Quest 14:How much of property do you lose: All=3.77%, 1/2=62%, 1/4=12.57%, Less=10.69% Quest 24: Will buildings need to be relocated: Yes=7.54% Comment: Dismantling & relocating is not possible. Too labour intensive & costly

PROPERTY ACCESS ROADS:

A further 19 people will lose their road access to their property. Road access has been a big social impact issue here. Although Council has been asked on a number of occasions, where would alternate access roads be located, there has been no reply. Concern of 2 residents is that alternate access routes would not be via Byrrill Creek, but possibly Kyogle Rd & Tyalgum, I resident is concerned that a longer access road will be more maintenance & cost. (*See attached letter R. Hoopman*) I other resident is concerned that an alternative route for 16 + families would run close to his house, impacting on his privacy.

Survey: Quest 21: Service Access roads within property affected: Yes=14.46% Major changes=6.28%

BYRRILL CREEK ROAD ACCESS:

The proposed dam would cut the front end of the valley from the back end, if the road was not replaced. (High costs, difficult terrain & environmental impacts may eliminate a proposed replacement road). At the Mebbin end of Byrrill Creek Road, Palm View Hamlet is located, with 29 shares & another 4 neighbouring properties. A few families there, have children who attend Aetomah School, situated on Kyogle Rd, & they use the road on a daily basis for school runs during the week. *(See attached letter G. Grayson)*People further afield towards Tyalgum would also be affected. Access to Mebbin National Park & routes via Mebbin & Cadell Rd would also be inundated.

Survey: Quest 20: Public access roads affected: Yes=25.78% Comments: 3 felt that after construction the road will be better& 2 felt environmental impact was an issue.

COMMUNITY & SOCIAL COHESION

Many residents feel the proposed dam will cut them off from the Byrrill Creek community, which erodes the social fabric of the valley as a whole. From Survey results & interviews, 3 residents & 2 businesses support the concept of a dam, but the majority who returned their surveys did not. This adds a sense of divisiveness within the community.

2 residents point out the lack of privacy after the proposed dam is finished ie vandalism, hooning, parties, which is what happened at Clarrie Hall, which in the end was resolved by locked gates in the evening, which could restrict access for locals.

ADEQUATE COMPENSATION

There are concerns by some residents of adequate compensation, as many Clarrie Hall residents did not feel adequately reimbursed at the time of their buy backs. These concerns are about real estate values of homes being depreciated due to the dam, the value of the land inundated, and access roads. It is interesting to note that in the Public Works Document, of the total Dam Cost estimate of \$58 million, that only \$2.4 mill is set aside for land purchase <u>and the reconstruction of Byrrill Creek Rd.</u> Peter Van Lieshout calculates his Forestry Plantation is approx worth this alone! (*See attached statement*) I wonder where these figures were derived from? On top of all this, many have felt the burden of caveats placed on their land years ago for a future dam in the 2025 which places the land & its use in limbo.

DISRUPTION OF ESSENTIAL SERVICES

As well as road disruptions to residents, essential services such as Electricity & Phone would be disrupted, during relocation of these services. Residents who use Byrrill Creek as a water supply may encounter difficulties with water supply after the dam wall is built.

Survey: Quest 22 & 23: Telephone relocated: Yes= 11.32% Electricity:7.54 % Interesting to note that in Comments 5 people indicated they were on Solar or stand alone systems.

COMMERCIAL ENTERPRISES: FORESTRY & TOURISM

Within the Byrrill Area, as compared with Clarrie Hall, farmers are not affected, except for some cattle adgistment on the Council Land. However commercial Tree Plantations on Council land and Peter Van Lieshout's land would be affected. Most of the trees will not meet maturity until 2020-2025.Peter Van Lieshout has 100 HA under a joint forestry agreements & approx 200ha contract with a private company, FEA, who lease his land, which provides an annual income.(*See Attached statement*)Investors would expect their promised returns.

Tourism:

Both Peter Van Lieshout & the Ridgeways, are involved in tourism. The latter owns the Mount Warning Forest Hideaway Motel, & the former runs Youth Camping Holidays, with 200 school children attending per week. Peter Van Lieshout considers the proposed dam would be an asset to his business, & would like free access to it for water based activities. Peter Ridgeway considers that during the construction phase there would be a downturn in business, but afterwards, it would enhance tourism.

(See Attached Letters)

On a broader scale, an employee at the Heritage Rainforest Centre in Murwillumbah, has said that many tourists request what could they do to see an overall view of Mt. Warning, and the Tourist ring route through Uki, Byrrill Creek to Tyalgum, then via Eungella to Murwillumbah is a favourite recommendation by workers there.

Beyond commercial businesses, many residents have spent years establishing gardens & orchards, around their homes that would be lost.

Survey: NB Mainly Clarrie Hall Replies

Quest 15: How much of your affected land is productive farmland? All=18.86%, 1/4=3.77%, Less=9.43% Quest 16: Which type of Farming activity is affected? livestock=25.15%, small crops=62.89%, orchards=3.14% Quest 17: Is Tourism affected on your property?Yes=3.14% Comment: Bed & Breakfast would be affected

PROPOSED DAM CONSTRUCTION SITE

During the construction period there would be huge impacts on residents, particularly those living in close proximity to the site. Impacts would include Blasting, Drilling & Machinery noise & vibrations, presumably night construction, as was the case with Clarrie Hall, Bulldozers & heavy machinery & trucks using Byrrill creek Rd. This is a narrow winding road, in some parts one way, which would create road closures & traffic delays. There is also the safety issues with wide trucks, & particularly at School Bus times, with children in close proximity to the road. Most residents who live close by will be forced to relocate until completion, many are on low incomes & could not afford current rental prices. There is a dire lack of rentals in the Uki area & construction workers would want this accommodation as well. The later bulldozing of 400 ha of land, much with high conservation values would be heart rending to many residents, & many comments in Surveys & interviews reflected the environmental destruction as being of overall importance to them.

Survey: Please refer to entire Question 25 & comments.

Comments Further afield: in Uki & a Kyogle road user felt the extra construction traffic would be an impact. Quest 18: Is wildlife habitat affected on your property: Yes=22.64% : Koalas, wallabies & platypus = 18.5% approx. Please refer to comments

ABORIGINAL CULTURAL HERITAGE:

There are several sites of Aboriginal Cultural significance on the Council land, which would be inundated. It has been passed on to me that there are possibly 3 burial sites, a birthing site and a camp site,& various tool sites, which would be a serious cultural & social impact on the local aboriginal community.

SOCIAL FEELINGS

Many of the residents living here have lived here quite long term, and feel a strong connection to the land here and the community in which they live. Please refer to "SOCIAL EFFECTS ON FAMILIES INUNDATED BY PROPOSED BYRRILL CREEK DAM" Presented by Jenny Pearson at the CWG Meeting 15th February. Others have the attitude "well its not in my backyard", or have expressed little interest in the matter. A few support the concept of a dam here. It is hard to get feedback & the anonymous Survey was most helpful. In the Survey there were a few in depth questions & lots of comments on how the Councils Water Option proposals affected people's feelings. These included feelings about loss of habitat, people's homes, anxiety about the future, divisions within the community,& closer to the dam site locations,: uncertainty for land use planning and property values. The answers were graded in 5 categories according to importance. Note that people beyond affected landholders answered these questions. *Please refer to Complete Question 26 & comments. Of most concern were: Permanent loss of Wildlife Habitat rated highest: Very Concerned=52.8% People displaced from homes: Very Concerned=46.5% Divisions within the community: Very Concerned=43.3%*

A Question from Alan, a Byrrill Creek Resident to the Tweed Shire Council

With all due respect to all traditional owners. Regarding Spiritual connection to land, why is it assumed that only Aboriginal people, with a provable connection to land have credibility? Many non indigenous people in this area have a deep connection of a spiritual nature to this land. Where is this connection being acknowledged, especially in regard to Byrrill Creek, just below Wollumbin?

Compiled by Joanna Gardner (Byrrill Creek CWG Representative)

PLEASE SEE ATTACHED APPENDIXES:

1 LETTERS ON SOCIAL IMPACTS FROM: *Attached* Robyn Hoopman & Andy McInerny Grayson Gerrard and John Dawson of Palmview Hamlet

2. LETTER & STATEMENT ON SOCIAL IMPACTS ON BUSINESSES: *Attached* Peter & Maxine Ridgeway, Mt Warning Forest Hideaway Peter Van Lieshout.

3. .."SOCIAL EFFECTS ON FAMILIES INUNDATED BY PROPOSED BYRRILL CREEK DAM" Presented by Jenny Pearson at the CWG Meeting 15th February. *See Minutes CWG 15/2*

4 " EFFECT OF LIVING BELOW A DAM WALL CONSTRUCTION SITE " Presented by Malcom Bailey at the CWG Meeting 15th February. *See Minutes CWG 15/2*

My Resources for this Paper included:

- 1. The Community Water Survey Data Base & Comments.
- 2. Data given to me by Tim Mackney, Water Projects Manager, on Affected Land holders of Byrrill Creek.
- 3. Written Statements by 10 affected tenants or landholders
- 4. Telephone interviews & written statement by Businesses that would be affected by the Dam.
- 5. Notes taken from 8 Byrrill Creek Residents Meetings
- 6. Conversations or phone calls from residents living here

My Thanks to the Residents living within the Catchment area of Byrrill Creek Dam.

APPENDIX: SOCIAL IMPACTS LETTERS

Robyn Hoopmann & Andy McInerny Tallowood 665 Byrrill Creek Rd Phone:02 66797017

QUERIES & OBJECTIONS REGARDING THE PROPOSED BYRRILL CREEK DAM

- 1. Would our relocated access be into Byrrill Creek, or Kyogle Road? Would our road be longer? If so, how would financial considerations be dealt with? A longer driveway would need more money spent on it over time. Unless compensation covers bitumening, we would be losing financially.
- 2. If our alternative access was not into Byrrill Creek, we would lose contact with our friends, & no longer be a part of the community here
- 3. Approximately one third of our land would be inundated. Would due recompense be fair & reflect the current market prices, rather than devalued because of the dam?
- 4. The loss of the environment around us is an important issue: Byrrill Creek is spectacularly beautiful and widely diverse in its native flora & fauna. We have resident Koalas here. We would feel this deeply in many ways, including utter disgust at the desecration of a dam.
- 5. Construction: Noise, destruction and devastation for how many years. We have heard many stories of the "yobbo" factor whilst the Clarrie Hall dam was being built
- 6. Our privacy is an important aspect of our life here, which we would lose during the construction phase and afterwards, as the dam would become a recreational area.

PALMVIEW HAMLET

Grayson Gerrard and John Dawson

Lot 25, Palmview Hamlet 1283 Byrrill Creek Road, Brays Creek

I am writing to you about the impact that the proposed Byrrill Creek dam would have on us. We live at Palmview Hamlet, 1283 Byrrill Creek Road. The proposed dam would severely affect our present access roads to Uki, Lismore, Nimbin, Kyogle and other areas. Our access to friends, schools, workplaces, stores, and amenities would be drastically affected.

There are twenty-nine lots here on Palmview, and I imagine that most of our neighbours would be affected in exactly the same ways.

Further, our bushfire escape routes would also be limited to the Tyalgum road , which, in the case of a fire, all the cars in the area would be using and congesting.

In addition to the very negative social effects a dam would have on us, it would have tragic effects on wildlife. Much of it would be drowned, and all the survivors would be forced into territory already occupied by others and be driven off and likely die of starvation. For us, the terrible effects on wildlife are just as important as the effects on ourselves.

We would be grateful if you could pass these views onto the relevant planning authorities.

With thanks, Grayson Gerrard and John Dawson

APPENDIX: COMMERCIAL IMPACTS : STATEMENT & LETTER

PETER VAN LIESHOUT 2888 Kyogle Rd. Kunghur.

Approximately ¼ to 1/3 of my land is affected by the proposed dam. 4 to 5 years ago I cleared some of my land for a commercial forestry plantation. 100 hectares was planted as a joint project with the State Forestry, & a further 200 hectares were leased for 20 years to a private Tasmanian forestry company, FEA. I receive an annual income of \$30,000-\$40,000 from this lease.70 to 90% of this commercial plantation venture would be inundated before reaching maturity in approximately 2025 if the dam went ahead. I would lose this income and Investors would expect their promised final returns. The compensation for this would likely be more than \$2.5 million.

My land is also used for Educational Outdoor Youth camps for school groups & up to 200 children a week may attend. At present the groups use Clarrie Hall Dam for water activities, as well as my own large dams, so the proposed dam would be of benefit to this business. I would like easy open access to the dam for these activities.

Two existing large dams, that I use at present would be inundated, & they were back up water supplies for Nightcap Village, so I would want to ensure water rights on the creeks, such as Kunghurloo, prior to them feeding into the Byrrill Creek Dam.

As my land was cleared recently it will not be a big impact on wildlife, and from my observations of wild life around my existing dams, the proposed dam will help increase wildlife.

My feelings about the proposed dam are fairly neutral, however if it does not go ahead, I dislike the caveats placed on my land & find the feeling of being in limbo about it all, for future land use planning, is difficult.

Peter & Maxine Ridgway Mt Warning Forest Hideaway 460 Byrrill Creek Road Uki NSW 2484 t: (02) 66 797 277

Dear Joanna,

Further to our telephone conversation please find below a statement from me.

It is very difficult at this stage to predict how the dam will affect our business.

During the construction period the 'tourism' aspect of our business will be drastically affected. If we are able to 'pick up' accommodation from those working on the construction of the dam, then this will of course benefit our business.

After the dam has been constructed, if there are access facilities to the water from the head of the dam, this will obviously benefit our business in the form of leisure facilities that the dam can offer our guests.

Overall the dam's location and size would have no direct impact on Mt Warning Forest Hideaway.

Regards,

Peter Ridgeway







All affected land holders, community representatives, and interested residents of Tweed Shire, are invited to the Meeting.

Topics include:

- ***** A Presentation on the Dam options, ***** Community Working Group **Representatives from Byrrill Creek & Clarrie Hall Dam Areas**
- ★ An open forum discussion/questions,
- ★ A community survey of peoples views.

COME ALONG & GET INVOLVED IN COMMUNITY CONSULTATION



ENQUIRIES: J. Gardner 02 66797039 or peter.symons8@bigpond.com

WATER OPTIONS TWEED SHIRE WATER AUGMENTATION 2nd PUBLIC MEETING UKI HALL Saturday 27th February 2pm



All affected land holders, community representatives, and interested residents of Tweed Shire, are invited to the Meeting TOPICS INCLUDE:

- Guest Speakers on the Environmental Considerations of the 2 Dam options, and Social Impacts on residents.
- ***** Advice from the EDO, Lismore, on Legislative Considerations
- Byrrill Creek Riparian Restoration Program
- * A short film & slide show
- Discussion/questions & ideas for Submissions on the 4 Water Options & Demand Management

ITS OUR COMMUNITY, OUR VIEWS, COME & GET INVOLVED

This meeting is organised by concerned residents & ratepayers ENQUIRIES: J. Gardner 02 66797039 or peter.symons8@bigpond.com



Dear Joanna,

As per your two questions below, following is a summary of my knowledge of the conservation value of Byrrill Creek and its riparian zone. This information is taken primarily from the three reports that you have referred to, that being the Stressed Rivers Report, the Eco-sure Riparian Restoration Prioritisation Report and the Bushland Restoration Services Byrrill Creek Rehabilitation Plan. The latter plan contains a detailed summary of all relevant Byrrill Creek information, and I believe a copy of this is being made available to the CWG. I am also attending a CWG field trip next Monday.

Values of Byrrill Creek

Stressed Rivers Assessment Report (August 1999) – Tweed Catchment, NSW Land and Water Conservation

Under the stressed rivers approach rivers were classified according to their assessed level of environmental stress (particularly hydrologic) and conservation value. Classification is subsequently used to guide management priorities and policies. High priority sub catchments are ones:

- Where demand for water already equals or exceeds supply (hydrological stress)
- Those where the water environment is already degraded (environmental stress)
- Areas of high conservation value

High Conservation Value sub catchments have been identified as having attributes that would justify a greater level of protection and management.

In 1999 Byrrill Creek was given a management classification of U4, indicating low levels of hydrologic and environmental stress and it is identified as a possible HCV sub catchment. The stressed Rivers Report also includes a future risk classification, which for Byrrill was rated as low for hydrologic stress and high for environmental stress.

As per the report, summary info for Byrrill:

- Very high proportion of sub-catchment vegetated 83%
- Very high predicted diversity of schedule 1 and 2 wet fauna species
- Very high diversity of wet flora species.
- Large stretches of waterway with minimal disturbance
- Large areas of national park and state forest (50% total)

Future risk considerations:

- Potential future town water supply
- Exotic vine infestation of streamside vegetation
- Infestation of camphor and privet
- Low risk of low flow usage at full development at 4ML/ha (0.2)

Tweed Riparian Restoration Prioritisation Report (2003) Ecosure, Burleigh Heads

This study has focused on investigating the conservation value and restoration potential of a number of sub-catchments of the upper Tweed Valley. Selection of the catchments to investigate was based on their being attributed significant conservation status in The Stressed Rivers Report (as discussed above) and because they contribute to the Tweeds water supply.

Eighty six riparian sites were investigated within 6 sub catchments and ranked according to their relative conservation and regeneration potential. High priority sites generally require the least amount of work to preserve their ecological values. Byrrill Creek was ranked highest of all the sub catchments and ten of the top thirty highest priority sites of all six sub-catchments were located within the Byrrill Creek catchment.

Byrrill Creek Riparian Rehabilitation Project

As a response to the findings of the Ecosure study, TSC and the Northern Rivers CMA collaborated in 2005 to initiate the Byrrill Creek Riparian Rehabilitation Plan. This project commenced with NRCMA appointing Bushland Restoration Services to prepare the Byrrill Creek Riparian Rehabilitation Plan. This document consists of a master plan overview of the catchments values and threats, and twenty seven individual property actions plans with specific recommendations for works. The majority of works implemented through this project have been related to weed management, with some fencing, planting and provision of off stream water for cattle. A significant effort has been made throughout implementation of the project to liaise closely with Byrrill Creek landowners and increase their interest in, knowledge of and commitment to assisting with the long term control of weeds on their riparian zones.

Impact of a Dam on Byrrill Creek

As I explained during our phone conversation, to adequately describe the impacts of a dam would require a large of amount of field research and access to detailed plans and arrangements for construction, operation and proposals for environmental and social impact management. Without this type of information my comments are at best, very general and superficial, and quite possibly less well informed than what you or the CWG may already have access to.

Impacts would fall into several categories:

- Construction related (traffic, noise, resource use, air pollution and many others)
- Footprint (the immediate land taken up by the dam wall/construction zone and effects on habitats and species and people)
- Hydrological (impact of water being held back in the dam the lack of water available to the natural environment, and changes to flow rate, frequency and duration and water quality)
- Inundation (the land lost, and all of the ecological, social, cultural, economic and climate impacts associated with this)

Hydrological changes and inundation associated with a dam obviously have profound impacts on the ecology of a waterway both upstream and downstream of the wall. All aquatic and riparian organisms are adapted to the flow regime within which they are found, as flow predominantly defines the habitat type. This statement applies as much to a small aquatic invertebrate living on the underside of a rock as it does to platypus or the type of trees lining the banks of the stream. Some organisms have a broad range of tolerance, that means, they can live almost anywhere, but others are very specific. In high conservation value environments with high biodiversity, like Byrrill Creek, it is common to find a large number of organisms with very specific habitat requirements.

-If it is assumed that construction of a dam on Byrrill Creek would substantially reduce flow in the creek, certainly within the early period while it fills, it can be assumed that there would be similarly scaled impacts on biodiversity.
-Once the dam is full, or partially full, it is assumed that an environmental flow release will be implemented. This may be successful in restoring a semblance of the natural flow regime, and depending on the magnitude of change and availability of refuge habitats, there would be some recolinisation of the affected channel.

-The presence of a dam wall would act as a barrier to migration by certain species.

-The dam wall would entrap sediment being washed down from the headwaters and could lead to an increase in downstream erosion.

-Inundation of the creek upstream of the dam wall would affect species in this area as much as downstream.

-Inundation of large amounts of vegetation has been reported to lead to significant export of methane to the atmosphere as the organic matter breaks down via anaerobic decomposition.

-New habitats will be created upstream of the dam, favouring a different suite of aquatic and terrestrial species.

Formal Statement from members of the Tweed Shire Council (TSC) Water Supply Augmentation Community Working Group (CWG)

We the undersigned wish to make the following statement about the TSC's future water options and the community consultation process:

Firstly, we wish to acknowledge that the Tweed Shire needs to have a secure water supply for the future. Secondly, we would like to congratulate the TSC's efforts in engaging the community in this vital decision. As members of the working group we have been provided with lots of data and information regarding the options, but this does not readily translate into sufficient knowledge to alleviate our concerns.

The need for additional water supply

We have particular concerns with the assumptions that justify the need for additional water supply. These assumptions include population growth, community adoption of demand management and recycling strategies, and the associated costs. WATER MANG - WATER

SUPPLY AUG- comm Most importantly, the population growth and the water demand projections need to be reviewed. We are concerned with the impacts of Councils planned large population, in terms of impacts on the environment, social services and existing infrastructure. We propose an independent review of the water demand projections be carried out, including: FILE No.WARC MANG -

- population growth projections
- the potential impact of current and additional demand management strategies
- alternative in-catchment bulk water supply options (stormwater harvesting and febuse programs), and

DOC. No:

REC'D: - 3 MAR 2010

the impacts of climate change scenarios. .

Such a review, undertaken by a reputable scientific institution (e.g. University of Technology, Sydney or the CSIRO), would clarify whether the actions currently proposed under the water supply augmentation process are warranted.

The four water supply options presented

We are concerned that Council has already constrained their decision to the four water supply options presented, «

 \subseteq without establishing adequate community engagement processes or consideration of the impacts on carbon emissions and the loss of the environmental values of the areas that may be destroyed.

The pipeline options (3 and 4) may be unviable due to the lack of political commitment from the host areas. We believe the energy and carbon costs of these options are unjustifiable in this climate. Furthermore, groundwater extraction in coastal and hinterland areas is also likely to have significant environmental impacts and community opposition.

The remaining two options are the raising of the existing Clarrie Hall Dam and the proposed Byrill Creek Dam. We believe Byrrill Creek is of such high environmental significance that it should not be considered an option. The NSW Tweed Draft Water Sharing Plan clearly states that a new Byrrill Creek dam is prohibited. Thus the raising of Clarrie Hall Dam appears the only remaining viable option (of the 4 presented).
We would like to see the proposed independent review of the Demand Management Strategy evaluate the potential for additional water saving measures such as mandatory rainwater tanks, stormwater harvesting and recycled water before committing to the raising of Clarrie Hall Dam. Contingency options should be regularly reviewed as new technologies emerge and costs change.

The CWG process

We appreciate the efforts that TSC has made to engage us, as community representatives, in this process. However, we feel that the process has been rushed and some of our concerns dismissed. In addition, the engagement of the wider community has not been adequate for such an important and complex issue with long-term ramifications for the Shire.

In Conclusion

We, and the community, would like to be reassured that TSC's demand strategy and water options selection process is in line with national and international performance standards, and appropriate to our environment. We strongly urge Council to commission an independent expert review of the need for additional water supply, prior to the commencement of detailed planning or environmental impact assessment of the preferred water supply option.

Signed: J. Gardred	1/3/2010	JOANNA GARDNER Po box 3322.
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Tony THOMPSON		20 BLACK WOODS ICE.
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B3.2: Due t	o requests by	y CWG members
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Due to requests by	
CWG	Question Register
	Additional community information sessions
	- Tweed Heads 10.02.2010
	- Murwillumbah 18.02.2010
	- Pottsville 23.02.2010
	CWG Site visits to Bray Park Weir, Clarrie Hall Dam and
	Byrrill Creek.
	Environmental Impacts Quantifier Matrix
	Social Impacts Quantifier Matrix
	Technical Note 2: Large Stand Alone Rainwater Tanks
	Report by MWH February 2010



Revision date: 24.02.2010

No.	Date	Question	Received	Received	Theme	Secondary	Status / Answer	Source / More info
			by:	from:				
1.1 1.2	03/12/2009	Where would the earth & rock fill come from: on site, or off site & if so from where? Would construction work traffic travel from the Uki end of Byrrill Creek or the	Email Email	Joanna Gardner Joanna	BCD BCD	Construction Construction	It is believed that the earthfill will be readily available at the dam site. Considering the exposed rocky bed of Byrrill Creek within the vicinity of the dam wall, it is expected that the required rockfill material would be able to be sourced from nearby sites within the inundation area. However this can only be confirmed once more detailed information is made available in the concept design stage. It is not clear at this early stage and will depend on several issues including development to find design, and the construction contractor.	Discussions with Public Works Sydney 14.12.2009. TSC staff discussions,
		r yaiguin enu :		Gardner			would be earthmoving traffic and is likely to be directly adjacent to the dam wall or wholly contained within the dam inundation area. However, all equipment and materials would need to be imported onto the site and it is likely that some construction traffic would occur in both directions.	Dec 2009.
1.3	03/12/2009	Would the road to Tyalgum be replaced by a new one, so there is a through road, or would it end at Pretty Gully?	Email	Joanna Gardner	BCD	Infrastructure	Replacement of the existing Byrril Creek Rd towards Tyalgum is under consideration and will depend on the ease of construction, costs, environmental constraints, and the need for continued access to the dam and surrounding properties. Approximate cost estimates for a windy all weather road have been included in the estimated costs for the two Byrrill Creek dam options.	MWH & Public Works report, Construction of Dam on Byrrill Creek Update of Cost estimates, Dec 2009 and discussions with Public Works Sydney 14.12.2009. (report distributed 16.12.2009)
1.4	03/12/2009	What is the estimated cost for the 40,000 ML Dam as compared to the 16,000ML?	Email	Joanna Gardner	BCD	Costs	The cost of the larger 40,000ML dam has been estimated at \$58.4M. The smaller 16,000ML dam has been estimated at \$38.3M.	MWH & Public Works report, Construction of Dam on Byrrill Creek Update of Cost estimates, Dec 2009 (report distributed 16.12.2009)
2.1	07/12/2009	Would you please forward to me Report Number 8 (Appendix B) - "Clarrie Hall Dam and Bray Park Weir Yield Survey", SunWater - July 2002 EO2065-01?	Email	Richard Murray	Water Supply	Secure Yield	In principle, yes we could provide this report. However it will take time for Council staff to locate and compile copies of a complex technical report of this nature, and we simply do not have the resources at present to respond to this query too. The contents of this report have a lower level of relevance for the CWG at present. I must therefore prioritise responses to more pertinent questions for the time being. I would also like to take the opportunity to stress that our time is limited and requests which are likely to assist the CWG provide considered advice on the environmental and social aspects of the four short-listed options will need to be addressed first.	NA
2.2	07/12/2009	Would you please forward to me "Tweed River System Water Supply Security	Email	Richard	Water	Secure Yield	See response to question 2.1.	NA
2.3	07/12/2009	Review" - SunWater - November 2006, G81903-02-03-03? Would you please forward to me "Clarrie Hall Dam - Determination of Optimum Size and Dam Raising Options study, Final evaluation Report" - NSW Department of Commerce, May 2008 - DC08060?	Email	Murray Richard Murray	CHD	Sizing	Copy of the report supplied.	Dept of Commerce report, Clarrie Hall Dam - Determination of Optimum Size and Dam Raising Options study, Final evaluation Report, May 2008
2.4 2.5	07/12/2009 07/12/2009	Estimated cost of raising Clarrie Hall Dam? A hard copy of these reports is preferable, but a CD copy is also acceptable. 1. Whether an expert Independent Review of the consultancy team's four water augmentation options should be considered. Such a Review would support the CWG's final deliberations on this matter.	Email Email	Richard Murray Richard Murray	CHD Coarse Screening	Costs	The estimated cost of raising CHD to 70m AHD is approximately \$30M. See the response to question 2.3 for the relevant report. The consultant's Coarse Screening (Stage 2) Report has already undergone a comprehensive expert review process. Water experts from Tweed Shire Council and NSW Public Works have carried out multiple reviews prior to finalisation of the documents. This Fine Screening (Stage 3) phase provides another level of scrutiny. In addition, once enough detailed information is compiled during the subsequent EIS phase, an expert review of the entire process and EIS recommendations will be carried out be an independent consultant to give Council further certainty before applying for development approval.	NA TSC staff and Public Works discussions, Dec 2009.



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2.6	07/12/2009	2. One of the main sources for Tweed drinking water is the Bray Park Weir which dams the reaches of the Upper Tweed River and its connecting Oxley River. Clarrie Hall Dam supports the Bray Park Weir drinking water source supply when	Email	Richard Murray	Water Supply	Secure Yield	There are three water supply networks in the Tweed Shire. Two small networks supply the rural villages of Tyalgum and Uki, while the major network supplies Tweed Heads and surrounds, the Tweed Coast and the Murwillumbah	TSC website 14.12.2009 www.tweed.nsw.gov.au/ Water/WaterSupply.asp
		the two river supply source is depleted particularly during dry conditions and to flush out Bray Park Weir when affected by algal blooms.					district. The major network draws its water from the Tweed River, upstream of the Bray Park weir. The weir acts as a tidal barrage, preventing salt water from the estuary getting in to the fresh water supply. Flows into the weir are supplemented by releases from Clarrie Hall Dam situated on Doon Doon Creek - a tributary to the Tweed River. It is important to note that Clarrie Hall Dam is only used to supplement the town water supply. For much of the year it is natural flows in the Tweed River that supply our water. Water is only released from the dam when flows in the freshwater section of the Tweed River fall below 95%, usually during winter and spring. These releases contribute to environmental flows in the river during the drier months of the year, with the water flowing down Doon Doon Creek and into the Tweed River upstream of Uki village. It then flows down to Bray Park Weir, where it is extracted, treat of over 660km of piper to 22 reconvirter throughout the object.	te
2.7	07/12/2009	a (a) How much water is drawn from the Upper Tweed River and its connecting Oxley River for urban and country supplies seasonally?	Email	Richard Murray	Water Supply	Demand Management	Approximately 9550ML of water are drawn from the Tweed and Oxley Rivers by Tweed Shire Council for urban supplies. Council does not have details on the amount of water drawn from these water sources by other domestic, agricultural or commercial users.	TSC: CCC reporting
2.8	07/12/2009	(b)How much Bray Park Weir stored water is released as environmental flow during dry periods when the Upper Tweed River ceases to flow?	Email	Richard Murray	Water Supply	Secure Yield	During periods of low flow Council draws off only the water released from Clarrie Hall Dam for urban use. All natural flow in the Tweed River continues to flow through the Bray Park Weir.	TSC staff discussions, Dec 2009.
2.9	07/12/2009	3 (a) Has the supply demand balance been correctly assessed by the consultance team for the time period ending 2036 when it is stated that Tweed's population wi double to 160,000. This number equates to an approximate 2.69% annual increase in population for that period.	y Email II	Richard Murray			Population projections have been based on a detailed breakdown and analysis of the size and predicted timing of individual growth areas, and the effects of other issues such as infill and reduction in the average houshold size in existing areas. [Note: the Demand Management Stategy is being finalised and should go on pulic display in Jan 2010]	MWH report, Draft Demand Management Strategy, Dec 2009 (Table extract distributed 16.12.2009)
2.10	07/12/2009	9 3 (b)Tweed Shire claims to have enough water for 105,000, enough to provide until 2017 even allowing for current demand management strategies and rainwater tanks in new developments. How has this drinking water supply source been calculated for the period to 2017?	Email	Richard Murray			Various water use (demand) scenarios have been estimated for the period 2006 - 2036. These are based on the population projection together with the expected per capita water savings under each scenario. One scenario based on implementation of BASIX in new residential developments only (ie the bare minimum under state legislative requirements) is the conservative demand curve used by Council in determining those figures. [Note: the Demand Management Stategy is being finalised and should go on pulic display in Jan 2010]	MWH report, Draft Demand Management Strategy, Dec 2009 (Extracted graphs of demand curves and population projections distributed 16.12.2009)
3.1	09/12/2005	9 What are the health restrictions for using rainwater tanks in urban areas?	Meeting	Katie Milne	Alternativ e Sources	Rainwater tank	s Council has engaged MWH to produce a technical paper on this topic which will be available in late January 2010. In the meantime I can offer some background information: NSW Health in its guidelines "Use of Rainwater Tanks Where a Public Water Supply is Available" states that "A properly maintained rainwater tank can provide good quality drinking water. Occasionally there are cases of illness from contaminated rainwater. In urban areas the public water supply remains the most reliable source of drinking water for the community. In these areas NSW Health supports the use of rainwater tanks for non-drinking uses. NSW Health recommends that people use the public water supply for drinking and cooking because it is filtered, disinfected and generally fluoridated. People who choose to use rainwater for drinking and cooking should be aware of potential risks associated with microbiological and chemcial contamination". State Environmental Planning Policy 4 (SEPP 4) means that rainwater tanks with a capacity of 10,000L or less do not require local council approval provided they meet the conditions of SEPP 4. All plumbing work (for rainwater tanks) is to be carried out or supervised by a licensed plumber in compliance with Council's Policy on Rainwater Tanks (attached), AS3500 and the National Plumbing and Drainage Code.	http://www.health.nsw.gc v.au/policies/gl/2007/pdf/ GL2007_009.pdf Technical Report distributed <u>26.02.2010</u>



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4.1a	09/12/2009	1)How much will our water rates rise due to both construction costs and running costs? Please answer this in present values of money.	Email	Tony Thompson	Council Rates		Capital Costs Council levels charges for the cost of augmenting the water supply on all new developments. These charges are based on the estimated future capital cost and projected population, and are reviewed every five years. In this way augmentation is paid for by the new developments that produce the additional demand. To ensure an ongoing water supply, Council will need to augment the system prior to the construction of the all new developments (and prior to receiving the full amount of developer charges). Council would then borrow a portion of the capital costs which would incur financing costs (loan costs). These are not fully recouperated from developer charges and under the LGA Act Council is not permitted to include the cost of financing. This additional cost is met by the entire rate payer base. Depending on the timing of the infrastructure, the amount borrowed and the financing conditions, the increased cost to ratepayers is estimated at between 0.5-1.5 cents per kL.	TSC staff discussions, Jan 2009
4.1b	09/12/2009	1)How much will our water rates rise due to both construction costs and running costs? Please answer this in present values of money.	Email	Tony Thompson	Council Rates		Operating Costs In terms of overall operating costs, the cost to operate and maintain the bulk water supply (CHD) is relatively small compared to the treatment and reticulation system (treatment plants, pipes and reservoirs). Bulk water operating costs could vary significantly depending on which augmentation option is selected. There would be little change in the cost to operate an enlarged CHD. One could expect that the BCD option operating two dams (both CHD and BCD) would cost approximately twice that. Operation of the SEQ pipeline could be considered to further increase bulk water opearting costs due to the higher pumping costs.	TSC staff discussions, Jan 2009
4.2	09/12/2009	2) Where do the projected population figures come from and could we see a copy of those calculations?	Email	Tony Thompson	Populatio		See response to question 2.9.	See response to
4.3	09/12/2009	3) Are all new houses to be built going to have town water and does this mean	Email	Tony	Water	Connections	All new houses in urban areas would be connected to "town water". There is no	TSC staff discussions,
4.4	09/12/2009	that there are plans to put everyone on town water? 4) Has the work that has been done included any projections for global warming and could we see the figures?	Email	Thompson Tony Thompson	Supply Water Supply	Secure Yield	intention of connection new or existing rural properties. Tweed Shire Council has not undertaken specific modelling of climate change effects, however it is confident that any climate change effects have been adequately taken into account. Modelling of the Tweed's Secure Yield (capacity of the water supply system) has taken into account all climate data to date including the effects of the worst droughts on record. Climate change modelling carried out for SE QLD and for Rous Water have shown that the secure yield in those adjacent regions could be reduced by between 7- 15%. However, each of the short-listed water supply options are able to supply more than the required projected Secure Yield even when taking these reductions into account	Dec 2009. TSC staff discussions, Dec 2009.
4.5	09/12/2009	5) Have evaporation figures been taken into account and are there any means	Email	Tony	Water	Secure Yield	Yes, modelling of the Tweed's Secure Yield (capacity of the water supply system) has	TSC staff discussions,
4.6	09/12/2009	being looked at such as reeds to help reduce evaporation? 6) Have the sides of the dam been surveyed for any possible leakages such as areas of porous rock?	Email	Thompson Tony Thompson	CHD		taken the effect of evaporation into account within the analysis process. It is important to understand that no dam is water tight. However dams are designed so that water travels through the embankment in a controlled manner which limits water loss and protects the ongoing structural integrity of the dam. Some porous geological formations at the site of the Clarrie Hall Dam were identified during the construction of the original dam wall. These were sealed at that time by injecting grout into holes along the foundation of the wall. Council's regular inspections of the dam since then have not shown any signs of excessive seepage. Nor is there any indication that there is excessive seepage from other areas within the inundation zone.	Dec 2009. TSC staff discussions, Dec 2009.
4.7	09/12/2009	7) You mentioned that this is the safest dam but will that still be the case when its height is increased and could we see the calculations for this please?	Email	Tony Thompson	СНД		 Any increase in the height of a dam or a new dam will need to be designed, constructed and operated to meet all dam safety requirements. As a background to the existing situation: Under the Dam Safety Act 1978, Clarrie Hall Dam is a "prescribed dam" which requires the NSW Dam Safety Committee (DSC) to monitor the safety of the dam. In particular the DSC is: (a) to maintain a surveillance of prescribed dams, the environs under, over and surrounding prescribed dams and the waters or other materials impounded by prescribed dams to ensure the safety of prescribed dams (b) to examine and investigate the location, design, construction, reconstruction, extension, modification, operation and maintenance of prescribed dams, the environs under, over and surrounding prescribed dams and the waters or other materials impounded by prescribed dams. 	Dam Safety Act 1978 http://www.austlii.edu.au/ au/legis/nsw/consol_act/ dsa1978124/



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No.	Date	Question	Received	Received	Theme	Secondary	Status / Answer	Source / More info
48	09/12/2009	8) Does the expected increase in population mean that the council is about to	by: Email	from:	Populatio		No. Council continues to follow its existing Local Environment Plan or LEP (adopted in	I FP·
T. U	03/12/2003	alter its development policy and if so where are these extra properties to be built?		Thompson	n		2000) which designates areas earmarked for future development. The LEP is a legal planning document that provides information as to what development is permitted within the various zones within a Shire. The sum total of those zones has given rise to the population estimates used in this project (refer to the response to question 2.9). In addition to this, the NSW Dept of Planning's "Far North Coast Regional Strategy" (2006) which has also earmarked a similar population projection for the Tweed.	http://www.tweed.nsw.go v.au/PlanDevBuild/Plann ingTweedPlanningDocu ments.aspx DoP Strategy: http://www.tweed.nsw.go v.au/PlanDevBuild/Plann ingDeptOfPlanningDirect ions.aspx
4.9	09/12/2009	9) Is there a possibility that water from the dam could be unuseable due to algae polution in which case what back up do we have?	Email	Tony Thompson	Water Supply	Quality	As is currently the case, intermittent blooms of potentially dangerous algae could also possibly occur in a raised Clarrie Hall Dam or in a new Byrrill Creek Dam. Having a second dam would provide some additional back-up since there is a reduced likelihood that both dams would experience simultaneous outbreaks, in which case water could be drawn off from one dam while the other recouperated. Whatever the case, Council's water treatment plant at Bray Park is able to treat water containing blue-green algae to remove the danger to residents. The new water treatment plant will also have this ability.	TSC staff discussions, Dec 2009.
4.10	09/12/2009	10) If the regulations were changed and every new house had to have say 40,000 litre tanks then would all this new expense be required?	Email	Tony Thompson	Alternativ e Sources	Rainwater tanks	Unfortunately this would cost far in excess of the amounts we are considering for the short-listed options and would not necessarily result in a secure water supply. Council has engaged MWH to produce a technical paper on this topic which will be available in late January 2010. In the meantime, as way of example we can take your 40,000kL tank and look at the costs: A tank of that volume is equivalent to a round 4m diameter tank approximately 3m high. The cost to install and plumb that tank whilst building a new house would cost in the order of \$10,000. If we compare the cost of raising Clarrie Hall Dam and providing reticulation to these new areas (approx \$30,000,000 + \$30,000,000 = \$60M) then for the same budget we are able to supply approximately 6,000 homes or approximately 18,000 people with water tanks assuming an average 3 person household (60,000,000 / 10,000 x 3 person). By contrast raising the Clarrie Hall Dam will supply more secure yield than is required for the next 30yrs (servicing a population increase in excess of 80,000 people). To make matters worse, the Tweed region can often go for periods of up to 100 days with decent rainfall and so to ensure the security of the water supply an average 3 person hou would actually require at least a 60,000kL tank (3 x 200L/d x 100days). There would obv be some increase in costs and therefore further reductions in cost effectiveness.	TSC staff discussions, Dec 2009. Technical Report distributed 24.02.2010
4.11	09/12/2009	11) Due to global warming and other factors the world is loosing 1% of its farmland per year and where new properties are to be built is most likely on farming property if this is true then our actions are morally wrong and must be halted. Please comment?	Email	Tony Thompson	Populatio n		See response to question 2.9.	NA
4.12	09/12/2009	12) Will property holders be adequately compensated for loss of land and how wil this be done? There is a lot of fear about this.	I Email	Tony Thompson	Stakehold ers	Compensation	Yes, property holders are protected under the Land Acquisitions (Just Terms Compensation) Act 1991. Under that act Council must negotiate a fair price with the landholder, which must be equal or greater to the unaffected market value of the property (ie the market value before the development was considered). Other factors are also taken into account such as severence of property, ongoing loss of income and hardship or difficulties. Once a development approval has been granted for the development the acquisition process can begin. The process is one of negotiation. Usually this will mean that both the landholder and Council will engage valuers to value the property and any other factors and then use these values as a basis for negotiations. If for some reason the parties can not agree on a final value for compensation the case is referred to the NSW Valuer General who is bound by the Act and must determine the value of the just terms compensation.	http://www.austlii.edu.au/ au/legis/nsw/consol_act/l atca1991442/
6.1	09/12/2009	That when/if a Big CWG meeting was held at Crams Farm then we invite the community along.	Email	Colleen Edwards	CWG	Meetings	As was mentioned at the last CWG meeting, we can discuss having a CWG meeting at alternative sites; and one of these could be combined with a visit to Crams Farm. However, it would not be a public meeting and would be attended by CWG members only.	TSC staff discussions, Dec 2009.



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6.2	09/12/2009	To increase the capacity of water storage area the silt retaining levee banks at Crams Farm be removed and used as fill in the centre gully or as top dressing. (I don't know if this was meant to be an alternative to a dam or supplement).	Email	Colleen Edwards			I'm not certain as to what exactly is meant by this question. Whatever the case, these types of detailed questions can only really be answered once more detailed design work has been carried out during the next phase of the project.	NA
7	14/12/2009	What is the land area covered by the larger Byrrill Creek Dam?	Phonecall	Joanna Gardner	BCD	Sizing	Approximately 400 hectares. The smaller 16,400ML dam covers approximately 240 hectares. By comparison, the raised Clarrie Hall Dam covers approximately 435 hectares.	TSC: GIS Contour maps
8.1	14/12/2009	How many properties are connected to the Water Supply Network in Tweed Shire?	Phonecall	Richard Murray	Water Supply		There are approximately 34,500 properties connected to the water system in Tweed Shire. Of these approximately 32,300 are residential and 2,200 are commercial connections.	TSC: CCC reporting
8.2	14/12/2009	What is the total amount of water that is used by these properties?	Phonecall	Richard Murray	Water Supply		Approximately 8650 ML of water is treated at the three treatment plants each year. Of this approximately 7650 ML is delivered to rated connections. The difference is due to maintenance cleaning and flushing, pipe bursts, leakage, meter inaccuracies and water theft.	TSC: CCC reporting
9.1	14/12/2009	Demand Management Strategy - Stage 1 ii Non-revenue water is currently estimated to be around 13% of the total water produced. The Infrastructure Leakage Index is relatively high at 2.3 for the Bray Park system. For systems with this level of loss, it is recommended that an active leakage reduction program be implemented. Question 1: Where is the leakage reduction program up to? Has there been any new calculations on water loss? Is there room for further improvement? This is revisited in Q14 from page 22.	Email	Robyn Lemaire	Demand Managem ent		Council has identified that the amount of Non-Rated Water (NRW) in the Tweed system can be reduced. This is a problem that is being felt by all water suppliers throughout Australia. No system will ever be completely leak free, but there is certainly room for improvement by all players within the industry. As such, leakage reduction has been identified as one of the 18 Strategic Actions in Council's Integrated Water Management Strategy. Council has begun to carry out night time "drop tests" in particular reservior service areas to determine whether the system in these areas suffers from significant leakage. To date Tweed Heads and Tweed Heads West have been tested and other areas will follow (see attached report). Another major component of NRW is water theft. Council is in discussions with other Councils and service providers to determine possible ways of reducing unmetered water use and reduce water theft.	Report attached (DMS reports x3 distributed 22.12.2009)
9.2	14/12/2009	iii Brownfield Options Question 2: What is the WELS Program?	Email	Robyn Lemaire	Demand Managem ent		WELS stands for the Federal government's Water Efficiency Labelling and Standards (WELS) Scheme. WELS is a government regulatory scheme, underpinned by product testing to Australian Standards. WELS products must carry a WELS label showing the water efficiency star rating and the water consumption or flow rate of the product. For plumbing, WELS products are taps (with some exceptions), showers, toilets, urinals and flow controllers (optional). Some of these plumbing products will also carry a label called WaterMark.	http://www.waterrating.go v.au/watermark.html
9.3	14/12/2009	iv Rainwater tanks are calculated on a minimum of 160m2 roof area, a 5,000L tank, and connection to external uses, toilet flushing and cold water to washing machines. Question 3: What is the Tweed average sized roof area? The roof size seems very large for the Tweed, it is latter pointed out (page 44 of report) that the SEQ area has an average of only 100m2 roof area. I would have thought that our LEP site coverage would imply that the roof coverage would be even less than this. 2 The Scope of the work includes TSC sourced data. Question 4: Is there any other sources, and are they any different?	Email	Robyn Lemaire	Demand Managem ent		One potential restriction on the reliability of rainwater tanks is the area of roof (ie catchment area) that is connected to the tank. Gutters in a new home can be designed to maximise the amount of roof catchment being directed into the rainwater tank; this is potentially more difficult when retro-fitting an existing house. The figure of 160m2 is based on connection of 80% of the average 200m2 roof area in new subdivisions. This figure was used in modelling to determine the reliability of the 5000L tank and 160m2 roof size combination which gave a result within the range of previous studies for other regions (including the Gold Coast). The Gold Coast study was based on a smaller 100m2 roof catchment, and so to ensure the Tweed study did not over estimate potential water savings, a reduced yeild figure of 230L/dwelling/day was eventually adopted throughout the report (Section 5.3.1 Rainwater Tank Performance).	Demand Management Strategy - Stage 1
9.4	14/12/2009	 The conventional water system management fails to take account of the interactions between the elements of the water cycle. TSC estimated serviced population in 2006 was 73,185 persons. Occupancy rates Mutli-Family Residential MFR and Single-Family Residential SFR for 2006 are 1.95 and 2.8 respectively. At ultimate development the total residential population of these areas will be 34,003 persons. Question 5: Is this based on the LEP and the current density projections? What impact will overdevelopment have on these figures? Kings Forest far exceeds population expectation under the current plan. 	Email	Robyn Lemaire	Demand Managem ent		See response to question 2.9.	TSC staff discussions, Dec 2009.



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9.5	14/12/2009	10. It was assumed that the development would commence in 2012.!Table 3-2 Serviced (Water) Population Projection for Tweed Shire.Question 6: Why is the serviced population reducing as time progresses?	Email	Robyn Lemaire	Demand Managem ent		A general trend experienced throughout Australia (and developed countries) is that the average number of occupants per residence is reducing. This is due to a number of factors including smaller family sizes. These types of demographic trends were used to improve the accuracy of estimates for projected water demand in these areas.	TSC staff discussions, Dec 2009.
9.6	14/12/2009	11. Commercial Sector - Growth proportional to residential population growth. Question 7: The business sector is saying that the aged population will not have this effect. How is this justified?	Email	Robyn Lemaire	Demand Managem ent		In the absence of better information, and given that the most of the commercial sector depends on the residential sector for its customer base, the growth rates for the residential population were used to estimate commercial baseline water use projections. It should be noted that the demand managed water use projections were based only on commercial-specific demand management actions (ie unrelated to residential demand management).	TSC staff discussions, Dec 2009.
9.7	14/12/2009	Rural Sector - No growth assumed. Question 8: What if it declines?	Email	Robyn Lemaire	Demand Managem ent		In the absence of better information, and given that rural water use is less than 1% of the total water supplied by TSC, the no growth assumption is acceptable.	Demand Management Strategy - Stage 2
9.8	14/12/2009	13. The Stormwater Management Plan (TSC,2000) has identified the areas of Cudgen Creek, Cobaki Lakes and Cudgera Creek to be under increasing pressure from future development. Question 9: What weighting of consideration should this be given? There will be environmental and river water quality issues.	Email	Robyn Lemaire	Demand Managem ent		Council's Stormwater Management Plan continues to guide stomrwater improvements throughout the Shire. Where possible, Council is working together with developers, such as in the proposed Rise development at Billambil Heights to investigate additional stormwater management systems. Installation of rainwater tanks have also been shown to assist in reducing stormwater runoff from impermeable surfaces and the associated potential affects to receiving water quality.	TSC staff discussions, Dec 2009.
9.9	14/12/2009	14. The total capacity of the Tweed Shire sewage system is 29 ML/day and corresponds to 122,300EP at 240 L/EP/day. The combined dry weather flow (at 2006) has been estimated at 21.6 Ml/day. Further, there are approximately 4000 local and rural onsite wastewater treatment systems. 15. Banora Point STP Question 10: Where is this up to? How will this work into the Plans?	Email	Robyn Lemaire	Demand Managem ent		See response to question 9.10.	
9.10	14/12/2009	Tweed Heads STP Question 11: Why was this decommissioned? Has it been decommissioned? How has this impacted on BPSTP?	Email	Robyn Lemaire	Demand Managem ent		The Banora Point plant was designed to take the additional flows from the decommissioned plant. The old plant was decommissioned due to a combination of changes in discharge requirements, aging technology, restrictions for future use of the site, and economics.	TSC staff discussions, Dec 2009.
9.11	14/12/2009	Kingscliff STP Question 12: Where is this now? Does this impact on any of the figures?	Email	Robyn Lemaire	Demand Managem		The new Kingscliff STP has been in operation since Feb 2009. The new treatment process and location were taken into account in the Demand Management Report.	TSC staff discussions, Dec 2009.
9.12	14/12/2009	19. During the assessment it was found that the MFR consumption for 2005 was unusual high compared to previous usage. It was concluded that this figure was not representative and the data was excluded from the assessment. Question 13: What happened in 2005? If it was climatically induced, for example; was it so hot that people showered more often? Washed clothing more often? Or did people need to water their gardens? Water restrictions?	Email	Robyn Lemaire	Demand Managem ent		There are any number of reasons for this "outlier" figure. Some of the change could be due to the factors you mention. There could also be other issues such as an error in readings or records that was not picked up at the time. Unfortunately we are not able to ascertain the reasons for such a large variation and rather than skew results it has been discarded.	TSC staff discussions, Dec 2009.
9.13	14/12/2009	 21. Increased residential water awareness and elevated water charges have an effect on water usage. Pipe leakages and repair is not ideal. 22. Introduce/improve active leakage control. Question 14: How far have they got into the project, and when is it considered to have been covered? What impact will this have on our supply demand? 	Email	Robyn Lemaire	Demand Managem ent		See response to question 9.1.	
9.14	14/12/2009	 24 New dwellings incorporated into the forecast are assumed to have reduced internal water consumption, as a result of the use of more efficient water use fixtures. In particular it is assumed that all new dwellings will have dual flush toilets. The reduction in internal usage is generally is approximately 22 litres per person per day. 31. The two key processes which drive the overall demand per capita up are as follows: Household size or dwelling occupancy trends; the end use model reflects a decreasing household size. Question 15: Household size refers to the number of people in the house, (page 50 of report) or, the roof size of the building to catch rainwater, influencing tank harvest? 	Email	Robyn Lemaire	Demand Managem ent		Household size refers to the number of occupants. See response to question 9.5.	TSC staff discussions, Dec 2009.



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No.	Date	Question	Received	Received from:	Theme	Secondary	Status / Answer	Source / More info
9.15	14/12/200	9 4.3.6 Baseline forecast does not include the impacts of WELS or BASIXS. Question 16: What differences will there be if these impacts are considered?	Email	Robyn Lemaire	Demand Managem		The difference can be clearly seen in the graphs in Figure 6.1. The four curves show the relative projections for each scenario (including with and without WELS / BASIX).	Demand Management Strategy - Stage 1
9.16	14/12/200	 9 34. 5.2.2BASIX with 5,000L rainwater tanks. Question 17: If the BASIX states there are 3,000L tanks requirement what impact will this have on the harvestable water resources? All the calculations are based on a 5.000 litre tank size. Page 50 refers to being inadequate to peak demand. 	Email	Robyn Lemaire	Demand Managem ent		Council has engaged MWH to produce a technical paper on this topic which will be available in late January 2010. A smaller tank will reduce the effectiveness of rainwater tanks as a demand management action, particularly during dryer times of peak demand on the water supply system. This is why Council is encouraging the installation of 5000L rather than 3000L tanks. As discussed during the first CWG Meeting, the successfulness of these demand management actions will determine whether we more closely follow the red baseline curve or the blue demand-managed curve. Obviously, our preference is to follow the demand managed curve as closely as possible, but the effectiveness of demand management actions will depend on factors such as persuading new home owners to install 5000L tanks.	Demand Management Strategy - Stage 1
9.17	14/12/2009	 9 37. Pimpama Coomera project the public acceptance of highly treated recycled water is very high. No problems with a comprehensive education program. 50. Rainwater tank scenarios were not assessed as it is assumed that tanks will not be available during periods of peak system demand, that is, tanks will not reduce the peak water demand. Although this assumption may be conservative for many normal demand years it is considered to be a prudent approach to system planning. Only the growth areas in Cobaki Lakes, Bilambil Heights, Terranora, West Kingscliff, Kings Forest and infill development of Tweed Heads area were considered as contributing to future system augmentation. A total of 50% of future of future Bilambil Heights growth is assumed to be server by Mcallisters Reservoir No.4, Country Club Reservoir (No.2). Question 18: Where is this project at? What is the holding capacity? 	Email	Robyn Lemaire	Demand Managem ent		Recycled water was examined and assessed within the Demand Management Stategy and was found to not be cost effective. Installation of rainwater tanks was adopted as a more cost effective demand management solution	Demand Management Strategy - Stage 1
9.18	14/12/2009	9 A total of 50% of future Kings Forest and 100% of other growth will be served by the augmentation between South Tumbulgum to Tweed River Crossing. Question 19: Where is this project at? Same with Cobaki Lakes?	Email	Robyn Lemaire	Demand Managem ent		All growth areas were considered when determining the baseline and demand managed water requirements for the Shire. See response to question 2.9	Demand Management Strategy - Stage 1
10	15/12/200	9 7. In Appendix A: Coarse Screening Byrrill Creek Dam: it states that Division 24 o State Environmental Planning Policy 2007 enables development for water storage purposes without development consent. Does this mean no Local Council DA or Environmental Impact Assessment is needed for Byrrill Creek Dam, or does this mean on a State level? The implications of this statement are very concerning	f Email e	Joanna Gardner	BCD	Environment	The term "development without consent " is planning terminology and has a very specific meaning regarding which form of assessment and approval process Council will have to follow to gain development approval. Under the NSW EP&A Act there are three pathways for development consent which may be relevant to our project: Part 3A, Part 4 or Part 5. "Development Without consent" means that a planning approval under Part4 of the NSW EP&A Act is not required, however an approval under Part 5 or Part3A of the Act is still required. Part 3A is for major projects and critical infrastructure of regional or state significance and the Minister for Planning is the approval authority. Part 4 is traditional path for development consent where the developer liaises with all relevant government agencies and applies to Council who is the consent authority. Part 5 is typically used for infrastructure projects and the determining authority is typically the proponent. Whether the development is undertaken under Part4, Part 5 or Part3A of the EP&A Act, approval of the proposed development is still required, as is a detailed environmental ass	Discussions with Public Works Lismore 22.12.2009.
11.1	15/12/2009	9 Will the representatives of the CWG's inspect the 2 dam option sites? If so, When?	Email	Colleen Edwards	CWG	Site visits	Site visits have not been planned. If all the members of the CWG would like to have site visits arranged, and a time during businees hours could be agreed upon, Council could look at organising that.	TSC staff discussions, Dec 2009.



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No.	Date	Question	Received	Received	Theme	Secondary	Status / Answer	Source / More info
			by:	from:		-		
11.2	15/12/2009	What would be the approximate length of the replacement McCabes bridge? Some landholders have expressed the need for surveyor's pegs to be put in place. Is this possible and when?	Email	Colleen Edwards Colleen Edwards	CHD Stakehold ers	Infrastructure	As previously discussed, it is difficult to determine the types and dimensions of structures, road deviations and infrastructure changes before the final dam level has been determined and modelling is able to more precisely estimate flood surge heights. The exact type of structure will depend on a number of factors including whether it should be flood free or a dry weather crossing only. By examining the current maximum inundation area for CHD one can estimate that Commissioners Creek Rd would need to cross a water body of approximately 150m in width just to the west of the position of the existing McCabe's Bridge. As previously discussed, it is also potentially misleading at this stage to place survey pegs considering that the final dam level has not been determined and modelling to more precisely estimate flood surge heights is not completed. Council also does not have the resources to survey all of the four options and over 40 individual landholders. In the meantime we are prearing A1 size photo-maps for each landholder at CHD. Certainly, once the preferred option has been determined and the effects of that option are better understood, then detailed surveys of individual landholder properties will be carried out.	TSC staff discussions, Dec 2009. TSC staff discussions, Dec 2009.
12.1 12.2	17/12/2009 17/12/2009	Clarrie Hall Dam, Determination of Optimum Size and Dam Raising Options Study, Final Evaluation Report: Pt.5. states: At FSL 70m, the storage and associated flood surcharge does not inundate private property. Wrong. Was this oversight factored into the current costing and scoring? Request Clarrie Hall Dam Update of Cost estimates (not included but supplied for Byrrill Ck). With special note to Land Acquisitions, Road and Service Relocations. The amounts stated for Byrrill Ck (16,300ML @ \$1,800,000 and 36,000ML @ \$2,400,000 seem very conservative to say the least	Email Email	Colleen Edwards Colleen Edwards	CHD BCD		This was an ambiguous wording in the report which was attempting to explain that individual dwellings were not expected to be inundated. This is still mainly correct. Council's latest inundation maps, based on updated topographical information received since the drafting of that report, show that there may be one residence potentially affected by the increased inundation levels. Cost breakdown attached.	TSC GIS system Table distributed 22.12.2009
13.1	18/12/2009	The Tweed community has also expressed their concern in the press that this project is being rushed and so I am also concerned by your statement: "I would also like to take the opportunity to stress that our time is limited" I hope that you would provide an explanation for this 'limited time' other than the need to meet some internal organisational planned target date to complete this part of the Project.	Email	Richard Murray	CWG		Time considerations are important on any project, and this one is no exception. Internal target dates have been set based on the critical planning path to ensure the Shire's water supply remains secure. This has been based on the assumed demand / supply capacity curves that we have discussed in CWG Meeting 1. Despite these pressures, this Stage 3 section of the project will have taken approximatey 11 months of work once complete, including five months of continuous Community consultation and involvement. It can be difficult when timeing is a consideration, however I can assure you that those at arms length to the process will invariably question why the process is taking so long.	TSC staff discussions, Dec 2009.
13.2	18/12/2009	Is it unorthodox that the fine screening of Option One 'Raising the existing Clarrie Hall Dam' be completed even before Tweed Shire Council's Demand Management Strategy was finalised?	Email	Richard Murray	Water Supply	Demand Management	The fine screening of all the short-listed options is what is currently being carried out, and is the stage where the CWG is involved. It is by no means complete, is focussed on four options (not just Clarrie Hall Dam) and will be finalised in approximately June 2010. Council's Demand Management Strategy (DMS) has been prepared in two stages. The first stage of the DMS, focussing on residential water use, has already been completed and was adopted by Council in its meeting of 17 February 2009. It had been placed on public exhibition for a period of eight (8) weeks closing 1 August 2008 with one late submission received. The report included demand-managed-water-use-projections for the entire shire to enable the continuation of ongoing planning, with a proviso that these estimates would be reviewed once the Stage 2 report was completed. The consultants MWH have now produced the Stage 2 report focussing on non- residential water use and a combined summary report to coordinate the recommendations from the two stages. The Stage 1 report has also been updated and corrected to improve consistency between the documents. Subject to a Council decision, these three reports will be placed on public exhibition in January 2010.	TSC staff discussions, Dec 2009.



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No.	Date	Question	Received	Received	Theme	Secondary	Status / Answer	Source / More info
			by:	from:				
13.3	18/12/2009	It appears that Council's policy does not provide for environmental flow through Bray Park Weir when natural flow ceases. How often has natural flow over Bray Park Weir stopped this year since the winter of 2009 and how often does the release of water (a requirement of up to 25ML/d) to service the fish ladder cease? The IWCM Report claims that at 1% percentile flow at the Bray Park Weir, the natural flow is 90 ML/d	Email	Richard Murray	Water Supply	Environment	Council is required to release water from CHD for environmental flows into Doon Doon Creek, not over the weir. The release of water from CHD is only related to the Tweed River (and Bray Park Wier) once the flow drops below 95 percentile at the wier. A "cease to pump" condition applies which stops COuncil from removing water from the weirpool unless there is a respective release from CHD.	TSC staff discussions, Dec 2009.
13.4	18/12/2009	Draft Water Sharing Plan Since the IWCM Report in March 2006, what is the status of a proposed Draft Water Sharing Plan that includes environmental flows for the Tweed River notwithstanding that Council is required to make a decision beyond their Interim Environmental Objectives? In this regard it is noted that Council approved on the 17 November 2009 that: "The cessation level for flow bypass requirements at Bray Park Weir be set at a level of 50% of the capacity of the Clarrie Hall Dam as proposed in the Department of Water and Energy (DWE) draft Water Sharing Plan for the Tweed River area "	Email	Richard Murray	Water Supply	Environment	DWE is finalising Water Sharing Plans for the Tweed and Council, as with all water users, will be required to work within the conditions of those plans.	TSC staff discussions, Dec 2009.
13.5	18/12/2009	In the IWCM Report (March 2006) and in more recent Council plans Tweed Shire council has consistently used a predicted population annual increase of 2%. At 2% per annum the population increase for the time period ending 2036 is far less than 160,000. Do you still maintain that the predicted population of 160,000 is accurate?	Email	Richard Murray	Populatio n		Yes. Council believes that the approach taken in determining the population figures for this project are more accurate and more appropriate than an assumed 2% annual growth rate for the next 30 years. See response to question 2.9.	TSC staff discussions, Dec 2009.
14.1	22/12/2009	I attended a meeting in Tyalgum last week and one of their many concerns was the release of effluent from the Tyalgum sewage treatment plant into the local creek (I think it might be Bray's creek). Can you give me more information about this topic? Specifically: 1) To what level is the sewage treated? 2) How much and how often is it released into the creek? 3) When was the last release?	Email	Sam Dawson	Tyalgum Sewerage Treatment Plant		Tyalgum WWTP is a small plant with a design capacity of 120kL/day and current loading of approximately 40kL/day. Sewerage receives primary and secondary treatment and must meet Department of Environment, Climate Change and Water, Environment Protection Licence conditions. This Licence can be viewed on the department's web site (search by Licence #3470). Secondary treated effluent produced by the plant travels through a catch balance pond and a maturation pond (disinfection via sunlight) before being irrigated onto adjacent pasture. The irrigated area has several zones and irrigation is sequenced between them. The entire area is bunded by a shallow swale to return any surface runoff (during wet wether) to a catch dam. Water from the catch dam is pumped back to the matuartion pond so it can be re-irrigated. During extended wet weather the catch dam will fill and effluent will overflow and drain across pasture along an overland flow path (approx 230m) and flow into the Pumpenbil Creek.	TSC staff discussions, January 2010
14.1	23/12/2009	Cont.	Email	Sam Dawson	Tyalgum Sewerage Treatment Plant		These events generally happen only a few days per year and always coincide with high stream flows. Any impact would be negligible and would not be measurable. Stormwater runoff from all sources into these streams during such events is the primary impact on water quality. Note, the Pumpenbil Creek and Oxley River confluence is well below the Tyalgum Water Supply off take and Weir.	TSC staff discussions, January 2010
15.1	28/12/2009	1. How often has natural flow over Bray Park Weir stopped this year since the winter of 2009 and how often does the release of water (a requirement of up to 25ML/d) to service the fish ladder cease? The IWCM Report claims that at 1% percentile flow at the Bray Park Weir, the natural flow is 90 ML/d	Email	Richard Murray	Water Supply	Environment	This is usually occurs approximately four times a year when there is a combination of very low river flow and high water spring tides occurring on the new and full moon. To stop saltwater ingress into the weirpool the fishladders are closed for approximately 6 hours during the period of high tide.	TSC staff discussions, January 2010
15.2	28/12/2009	2. Question to your replied statement: "Council does not have details on the amount of water drawn from these water sources by other domestic, agricultural or commercial users. TSC: CCC reporting "Is this statement correct as I note that The Tweed IWCM - Context Study &Strategy Report, Page ii, (March 2006) states: "Water users in the catchment include extractions for town water (around 10GL/a) and rural irrigation (around 4.8GL/a) and 1.7GL/a groundwater)"?	Email	Richard Murray	Water Supply		The initial response is correct. Council does not maintain up to date details for other water users. The responsibility for upkeep of this data lies with the NSW Office of Water, and updated information regarding current license extractions can be sourced through them. The IWCM refers to 4.8GL/a for all extractions across Tweed Shire, which were figures sourced from the relevant government department and current at the time of the drafting of that report in 2006.	TSC staff discussions, January 2010



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No.	Date	Question	Received	Received	Theme	Secondary	Status / Answer	Source / More info
-			by	from		,		
			by.					
15.3	28/12/2009	In my email of 18 December: Water quality below the Bray Park Weir. "The	Email	Richard	Water	Environment	As part of the Water Sharing Plan process, the NSW Office of Water has produced	TSC staff discussions,
		Tweed IWCM - Context Study & Strategy Report, Page 52,(March 2006)states:		Murray	Supply		report cards for each river reach and tributary. Further information can be found on their	January 2010
		the current extraction rates from the Upper Tweed River have led to the					website: http://www.water.nsw.gov.au/Water-Management/Water-sharing/Commenced-	Water monitoring data
		catchment being given a 'hydrological stress rating' of high as identified in the					water-sharing-plans/Draft-water-sharing-plans/default.aspx	provided in file Annual
		Stressed Rivers assessment Report (DLWC 1998)"The present ecosystem health						Volumes Estimate @
		of the upper Tweed River is unknown now since the last Tweed River Estuary						Bray Park Weir 1969 to
		Ecosystem Health Benort was made in 2000-2001 The last anthronogenic nutrient						2009 pdf on 23 02 2010
		impact assessment was carried out by the University of Oueensland in their						2000.pdf 0ff 20.02.2010
		Roport "Twood River Estuary Ecosystem Health Monitoring Program (2000 to						
		2001) Final Papart 2002 Estuary Ecosystem Health Monitoring Program (2000 to						
		the upper Tweed Diver system were in a constant state of outrephilostion " My						
		question is Since the University of Queensland Depart what is the present						
		question is. Since the University of Queensiand Report what is the present						
		studied health condition of water quality in the Upper Tweed River Ecosystem						
		Health below the Bray Park weir and How does Tweed District water Supply						
		Augmentation future strategy plan seek to the improve water quality in the Upper I						
15.4	28/12/2009	The CWG received a document: Demand Management Strategy - Stage 1, and	Email	Richard	Demand		It is correct that the Stage 1 report was previously publically exhibited as a draft for	TSC staff discussions,
		advised the release of this and two other Demand Management Strategy reports		Murray	Managem		public comment. The report has subsequently been reviewed and updated as part of the	January 2010
		were made available prior to public exhibition after January Council Meeting.			ent		finalisation of the Stage 2 and Combined reports. Advanced electronic copies of these	www.tweed.nsw.gov.au/
		"however they (the three documents) are not currently publically (publicly)					three reports were provided to the CWG on 22.12.2009 and hardcopies (including all	OnExhibition/OnExhibitio
		available". Tweed Shire Council invited public submissions on the Draft Demand					appendices) were provided during the CWG meeting on 18.01.2010.	n.aspx
		Management Strategy - Stage 1 [Reference 106740-01] during the period 5 June					The entire Demand Management Strategy subsequently went on public exhibition for a	
		2008 - 1 August 2008. Attached to the (2008) Draft and now missing from the					period of 6 weeks on 28.01.2010. Submissions will close 05.03.2010.	
		current Draft Demand Management Strategy are 16 documents (Appendices A-O)						
		which included Greenfield population forecasts and scenario Demand forecasts						
		for Bilambil Heights, Cobaki Lakes, Kings Forest, Terranora, West Kingscliff and						
		the Beview of Ontions for Cobaki Lakes. On the 17 February 2009 Council						
		approved nine recommendations on the (2008) Draft Demand Management						
		Strategy, Option 1 included Brownfield gross (for the chiroc existing and infill						
		Surdlegy. Option 1 included brownine a reas (for the shires existing and mining development grace), with a key facus on only developing on extensive leakage						
		development areas), with a key focus on only developing an extensive leakage						
	00/10/0000	Control and pressure program	F	D'slassel	Descent		The set of a LDMO decomposition (see all to Decomplicated and Ocean Codel and an initial line set in the	
15.5	28/12/2009	Question 4. (a) why have the Brownfield Areas how been omitted from the	Email	Richard	Demand		The original DMS document referred to Brownfield and Greenfield areas within the shire.	Demand Management
		Amended(16.11.09) Draft Demand Management Strategy (DDMS) - Stage 1		Murray	Managem		Greenfield areas refered specifically to the five major new development areas of Bilambil	Strategy
		(ReferenceA18/200) without explanation to CWG members, considering Council			ent		Heights, Cobaki Lakes, Kings Forest, Terranora, and West Kingscliff. Brownfield	
		had previously approved the (2008) Strategy on 17 February 2009					referred to all other urban areas including existing and new development areas. For the	
							amended report it was felt that a clearer description for all areas should be "Whole of	
							Council" since both existing and new developments were included.	
15.6	28/12/2009	Question 4. (b) What is the reason that 2008 (Appendices A-O) have not been	Email	Richard	Demand		The appendices were not provided electronically due to the excessive size of the files.	Demand Management
		provided in the Amended 16.11.09 DDMS. Blue Green Algae Planning Organic		Murray	Managem		Hardcopies of the reports, including all of the appendices, have subsequently been	Strategy - Stage 1
		contaminants, blue green algal type toxins and pesticides are present in the		-	ent		provided to the CWG on 18.01.2010.	
		Tweed River's raw water source at the Bray Park Weir for several months of each						
		year. The year 2009 was no exception when several red alerts for Blue-green						
		algae have been in place for most of the spring, with such alerts continuing						
		through to December. Two hundred and sixteen tonnes of nowder activated						
		carbon are provided annually to remove blue groon algal toxing, dangerous to						
		balth from the Brow Dark Weir's treated row water (Dage 27, Daragraph 10,2)						
		Departies Tweed Chire Council Drew Dark WIEL (Fage 57, Falagraph 19.2,						
		Operation - Tweed Shire Council Bray Park WTP Environmental Assessment						
		Report) Clarrie Hall Dam, Tweed Shire Council's reserved water source, is						
		located 14 klms from the Bray Park Weir and supplies water to the Tweed River						
		Bray Park Weir Stored water in the Clarrie Hall Dam requires two major aerators						
		to reduce growth of blue green algae before supply to the Tweed River. On the 9						
		December 2009 the North Coast Regional Algal Committee issued a 'red alert' Bul						
15.7	28/12/2009	Question 5 Does Council keep a Register available recording the following data	Email	Richard			Council keeps records of routine weekly sampling, and has a separate register of all blue	TSC staff discussions,
		on blue-green algal blooms in drinking water sources at Bray Park Weir?* Dates		Murrav			green algae alerts. Regular sampling is undertaken both under normal circumstances	December 2009
		when 'Bed alerts' for blue-green algal blooms have issued since the 1990 s *					and during blue-green algae events as per the guidelines for Blue-green algae	Records supplied in
		Types of toxic algal blooms present in sampling* Whether blue green toxins were					management. While the algae canable of producing toxins have been detected no toxic	NCBACC
		detected and if so levels of toxicity sthan 5000 cells/MI * Number of times water					events have been detected during this time	FORTNIGHTLY
		treatment was adjusted to maximise toxin removal* Number of times cample						REPORT vie 23 02 2010
		water treated and tested using mouse bioassay						
		שמנטי נוטמובט מווט נבסובט טאווץ וווטעשב טוטמששמץ.						
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No.	Date	Question	Received	Received	Theme	Secondary	Status / Answer	Source / More info
			by:	from:		_		
16.1	11/01/2010	I'm not a big fan of placing dollar values on environmental areas or services but in some cases it may be necessary to help those of an infinite growth philosophy to help grasp the value of what a 'green' place can be. I want to ask if a dollar value of the environmental destruction of the various options has been taken into consideration during the cost appraisal stage?	Email	Sam Dawson	Fine Screening	Environment	No. Environmental impacts have not been converted into dollar values for direct comparison with other financial costs. Council is in consultation with other government agencies to determine the extent of environmental compensatory habitats and mitigation measures that may be required for each of the options. This may provide some preliminary estimates of the dollar cost due to any environmental destruction, and will be available for input into the MCA.	TSC staff discussions, January 2010
17.1	12/01/2009	Is desalination still an option in the mix and if so are other sites for a desalination plant besides Tugun such as on the Tweed coast (NSW) receiving consideration by TSC?	Email	Rob Learmonth	Water Supply	Desalination	No, desalination is not being considered further. Desalination was one of the nine options examined in the Coarse Screening Options Report which investigated three desalination sites within Tweed Shire. Desalination was discounted due to excessive costs.	Tweed District Water Supply Augmentation Options Study Stages 1 & 2 - Coarse Screen Assessment of Options (distributed 01.12.2009)
18.1	12/01/2009	Could you please place on the next CWG agenda - Tweed Shire Council's October 2009 submission to the NSW Office of Water on the Draft Tweed Water Sharing Plan. A visit to the Bray Park Weir to explain how current low level environmental flows are managed via the fish ladder, beyond 95th percentile flows at Bray Park Weir.	Email	Richard Murray	Water Supply	Environment	Bray Park Weir was visited as part of the site visit attended by the CWG on 01.02.2010.	
19.1	13/01/2010	1. Page 7/40 Why is the population numbers declining over time, and not increasing? The number of accounts are rising over the years.	Email	Robyn Lemaire	Demand Managem ent		Population in existing areas is predicted to reduce due to the ongoing reduction in the average houshold size experienced in many similar areas around Australia. However the overall population numbers increase and number of accounts continues to rise due to additional greenfield development and some infilling effects in existing areas.	Demand Management Strategy
19.2	13/01/2010	2. Page 15/40 Why was scenario 4 taken on for study in stage 1, but not for Stage 2? I would have thought this to be the better option.	Email	Robyn Lemaire	Demand Managem ent		Option 4 - Indirect potable water reuse was intrinsically included. It was investigated and compared with other reuse, greywater and rainwater scenarios for greenfield development under Stage 1. The infrastructure required for indirect potable water reuse is approximately the same regardless of its use in residential or non-residential contexts (since recycled water is returned to the headwaters of Clarrie Hall Dam). The costings of that scenario under greenfield development also applied for brownfield areas and the entire shire and would have produced an identical cost/kL for non-residential users.	Demand Management Strategy
19.3	13/01/2010	3. Page 20/40 The base line is still very much higher than demand requires. Is this due to drought scenario? What is the advantage of having excess supply?	Email	Robyn Lemaire	Demand Managem ent		This graph only shows demand (ie water usage). The base demand line is the amount of water that would be used if we did not implement any demand management actions to reduce our per capita water use. The other lines show the relative effectiveness of the scenarios in reducing water use below the base demand line. In this graph scenario 1 saves water, but not as much as scenario 2, which in turn saves less water than either scenario 3 or scenario 4 (highest savings).	TSC staff discussions, February 2010
19.4	13/01/2010	 Is Council going to sell the water at market value? (Coke-a-cola?). The historical line looks like a more realistic volume to have in supply. 	Email	Robyn Lemaire	Demand Managem ent		Council introduced a user pays pricing policy in 2002. Users charges are structured such that 25% of water rates are a set fee and 75% are charged according to the amount of water used. Details of rates are available at http://www.tweed.nsw.gov.au/Water/WaterPricing.aspx	http://www.tweed.nsw.go v.au/Water/WaterPricing .aspx
19.5	13/01/2010	5. Page 21/40 Per capital demand drops until 2021 then stabilizes at 345. Is this due to the growth areas reaching capacity? How else does this show actual population growth?	Email	Robyn Lemaire	Demand Managem ent		This graph shows per capita water use. The modelling predicted that even under the baseline demand case people will reduce their water usage to some extent, giving a long term water use of 345L/p/day if we do not implement any demand management actions.	TSC staff discussions, February 2010
19.6	13/01/2010	Page 36/40 Recommendation 1 , in regards to Cobaki Lakes does not afford the best water savings as option with recycled water treatment would assist the problems in the River in that area	Email	Robyn Lemaire	Demand Managem ent		Refer to the answer to Question 19.11	Demand Management Strategy
19.7	13/01/2010	Recommendation 8 refers to a tracking performance plan. This needs to specify outcomes at every interval.	Email	Robyn Lemaire	Demand Managem ent		That is correct. The recommended performance tracking plan to be adopted will enable TSC to adjust the program to ensure that the overall demand is achieving the ultimate long-term reduction goals envisioned by the program. The plan ensures that if goals are not being reached, early action can be taken to improve performance.	Demand Management Strategy
19.8	13/01/2010	6. Is there a suitable Plan for the TSC to implement a water Efficiency Management Plan directly?	Email	Robyn Lemaire	Demand Managem ent		Council's Demand Management Strategy (DMS) is currently on public exhibition. Once adopted Council will move to meet the strategies identified in the report through implementation of specific actions. Some of these actions will require ongoing management under a management plan.	TSC staff discussions, February 2010



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No.	Date	Question	Received by:	Received from:	Theme	Secondary	Status / Answer	Source / More info
19.9	13/01/2010	7. Page 51 Water savings for conservation measures. This could take 5 to 10 years to reach it's outcomes. How will this impact on the modelling?	Email	Robyn Lemaire	Demand Managem		This has been allowed for in the modelling by assuming a rate of take-up for each of the conservation measures over the timeframe.	Demand Management Strategy
19.10	13/01/2010	8. Page 64 An estimated saving of 18% by 2038. This would reduce the demand for water. Has this been taken into account in calculations?	Email	Robyn Lemaire	Demand Managem ent		Yes, and the even greater water savings predicted have been taken into account in determining the Shire's future water requirements. Specifically, the affect of these savings has been taken into account in the blue curve contained in the graph in the Water Supply Augmentation Factsheet 1. By contrast, the red curve on the same graph does not consider any water savings.	Tweed District Water Supply Augmentation - Factsheet 1 "Why does the Tweed need more water?" http://www.tweed.nsw.go v.au/Water/WaterSupply Augmentation aspy
19.11	13/01/2010	9. What would be the expected maximum that could be saved? Would Recycling Plans be the biggest winner considering the financial support that is available through other Government levels?) Email	Robyn Lemaire	Demand Managem ent		The graph in Figure 5-3 of the Demand Management Strategy Stage 1 provides a good overview of the relative predicted savings from rainwater tanks, recycled water, and combined rainwater & recycled water. The report also considered overall costs to determine the least cost per litre of water saved at the bottom of Table 5-30 on page 71 - which resulted in rainwater tanks being the most cost effective per litre of water saved.	Demand Management Strategy - Stage 1
20.1	13/01/2010	 Feasibility Stage Cost Estimate for Clarrie Hall Dam Raising (FSL70m @ 42,300ML) Figures do not include Land acquisitions, roads and service relocations. 	Email	Colleen Edwards	CHD		For comparison purposes the costings for all options have been approached using similar methodologies. The feasibility stage costings are based on the preliminary estimates for the construction costs of the dam, plus percentage costs for design work, project management and other contingencies. This is standard industry practice for this project stage. It is recognised that land acquisitions and the relocation of services will be required for each of the options, and some costs have been allocated inthe estimates for these works. These are preliminary in nature and will need to be reviewed when more detailed information becomes available.	TSC staff discussions, January 2010
20.2	13/01/2010	2. A costing for potable water was also requested.	Email	Colleen Edwards	CHD		It is unclear what this question relates to exactly. All nine of the options looked at in the Coarse Screening Report were able to increase the secure yield of the Tweed's potable water supplies. Costings were carried out for each of those options in the report.	Tweed District Water Supply Augmentation Options Study Stages 1 & 2 - Coarse Screen Assessment of Options (distributed 01.12.2009)
20.3	13/01/2010	3. Will there be any caveats put on farmers land.	Email	Colleen Edwards	CHD		It is unlikely that Council would wish to have caveats placed on private land. In most circumstances Council will prefer to acquire enough private land to ensure a buffer around the FSL of the dam for the purposes of flood protection and catchment management. Council appreciates that land acquisitions will involve negotiations with individual owners, and will aim to provide an outcome that is mutually acceptable.	TSC staff discussions, January 2010
20.4	13/01/2010	4. Will the remaining farming land retain rural 1a category.	Email	Colleen	CHD		Yes, there wouldn't appear to be any reason for the zoning of remaining farm land to	TSC staff discussions,
20.5	13/01/2010	5. How would council maintain the buffer zone.	Email	Edwards Colleen Edwards	CHD		Maintenance of the buffer zone would be carried out much the same as it is currently at CHD. Maintenance may vary from riparian revegetation through to ongoing slashing depending on the existing condition of the area and the prevailing management plan.	TSC staff discussions, January 2010
20.6	13/01/2010	6. All dam options, CHD FSL 64.5, 67.5 and BCD 115.5 & 125.0 have been quoted with a spillway of 50m except CHD70 at 40m Why not 50m also?	Email	Colleen Edwards	CHD		The size of spillway is dependent on several factors including the dam height and flood modelling for the individual catchment. It is not possible to make such a comparison between the CHD and BCD spillways.	TSC staff discussions, January 2010
21.1	16/01/2010	Why spend all this energy, time and money to restoring a high quality conservation area to then flood it all?	Email	Joanna Gardner	BCD		As we've discussed in meetings, these are the types of difficult issues we are all trying to deal with. There is no simple answer to this question, and to many other similar ones. We must take note of all of these (sometimes conflicting) issues when the CWG makes its recommendations	TSC staff discussions, January 2010
21.2	16/01/2010	Can a paper be written on the effects that a dam would have on Byrrill Creek, or that if that was not possible that a paper on the value of Byrrill Creek & the riparian area.	Email	Joanna Gardner	BCD		Paper written and distributed at CWG Meeting 01.02.2010.	Email from Tom Alletson 28.01.2010
22.1	18/01/2010	The demand managed curve equates to what average daily per capita water consumption?	Meeting	Richard Murray	Demand Managem ent		The overall demand managed curve equates to approximately 259L/person/day. The average residential per capita demand for the entire shire is 169L/person/day, while for greenfield areas the residential per capita demand has been estimated as 153L/person/day.	Demand Management Strategy - Stage 1



Revision date: 24.02.2010

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23.1	20/01/2010	How much silt has built up in the CHD and how much has this reduced the storage capacity?	Phone	Robyn Lemaire	CHD		All dams collect silt in the deep areas behind the dam wall, and CHD would be no different. Anecdotal evidence suggests that there has been no appreciable reduction in the size of the storage capacity of the dam in almost 30 years since the dam's construction. The Dams Total constructed volume is 16,000 ML. the useable volume for water release is 15,000 ML. The difference of 1000 ML is allowed for siltation. The majority of settletable material will be deposited at the up stream end of the dam where flow velocities from the incoming streams reduce to almost zero even during flood events. If and ever required, dredging in these areas is a practically feasible.	TSC staff discussions, January 2010
24.1	24/01/2010	1. During Mark Hunting's Coarse screening - Rank 3 - Pipeline to SEQ Water, Grid, page 10, I asked the question about the existence of a water pipeline that was end capped at Coolangatta. Tweed Shire Council acknowledged that a 200mm water main had been capped at Coolangatta.	Email	Richard Murray	Water Supply		There is a pipeline that runs across the border in that area. It has been in existance since mid last century. It has a metered connection however the valve has remained closed since the mid 1980's.	TSC staff discussions, January 2010
25.1	26/01/2010	Have you ever questioned how the calculations of the secure water yield of 13750 ML/annum was calculated other than the formula offered? It may be a coincidence but I have made the following observation. NSW Office of Water currently describes the inflowing water sources of the Upper Mid Tweed River as being from the Lower Oxley River, Byrrill Creek, Upper Tweed River, Doon Doon Creek (includes Clarrie Hall Dam 16000ML capacity, Rolands Creek, Smiths Creek with a Low Flow index (80%ile) = 38 ML/day. NSW Office of Water - Draft Water Sharing Plans describe (at 20 February 2009) as follows: Total surface water entitlement of Mid Tweed River Source as 28728 ML/year 22 Water Act Licences (96% [=27578]ML/year) used for Town Water Supply, 4% used for irrigation purposes) Comment Multiply the inflowing water sources to the Upper Mid Tweed River Low Flow index (80%ile) at 38 ML/day x 365. The calculation equals 13870 ML/annum.	Email	Richard Murray	Water Supply	Secure Yield	Secure Yield Calculations - The secure yield is not determined by simple calculation but by a sophisticated computer model (IQQM) of the dam, river and weir system that utilises historic rainfall and climatic data and simulates on a daily basis how the existing system reacts under a predetermined set of operating rules. In simple terms it looks at the worst year or period on record and determines what amount of water can be extracted without the system failing. For our current system that was the 2002/03 drought (it was more severe than the previous 1902/3 drought). In this 12 month period if the 95%ile flow regime was in operation an amount of 13,750 megalitres could have been extracted from the weir pool at Bray Park. Needless to say it is significantly more complicated than this but in simple terms this is how secure yield is determined. It is also not possible to multiply the 80%ile flow by 365 to determine the secure yield of a system.	TSC staff discussions, January 2010
25.2	26/01/2010	Council appears to have selected the Low Flow index (80%ile) when there is actually 28728 ML/year annual river flow from the inflowing water sources of the Upper Mid Tweed River. I would not expect NSW Office of Water to have over allocated its 22 Water Act Licences.	Email	Richard Murray	Water Supply	Secure Yield	Councils water licence entitlement is 27,500 megalitres per annum. Other users (irrigators) make up the remainder of the amount of water contained within licences allocations for the Upper Mid Tweed (28,728 ML/annum). Councils licence entitlement would have been determined by the relevant state government department at the time (early 80's) of the construction of Clarrie Hall Dam in consultation with Council. It would have been based on the secure yield of the system as determined by the predecessor to the current IQQM model. That model utilised historic rainfall and climatic data as does the current model but was simulated on a monthly basis and did not include a 95% ile flow regime. As previously stated the latest IQQM indicates a secure yield far less than the previously determined amount. The secure yield has been peer reviewed and is considered robust and accurate. The state government have divested themselves of the role of undertaking secure yield assessments and therefore it was undertaken by Sunwater which is a Queensland Government owned consultancy. Whilst the secure yield has reduced from 27,500 to 13, 750 ML/annum the water licence allocation cannot be reduced as it is an entitlement already granted to Council.	TSC staff discussions, January 2010



evisio	n date:	24.02.2010						
0.	Date	Question	Received by:	Received from:	Theme	Secondary	Status / Answer	Source / More info
1	28/01/2010	Has any flow monitoring and modelling been done for Byrrill Ck to determine what environmental flows are and will be when a dam is built?	Phone	Joanna Gardner	BCD		Flow monitoring and modelling for environmental flows is carried out by the NSW Office of Water. They report that flow records for Byrrill Creek exist from 1969. It appears the Office of Water has had two gauges on Byrrill Creek, but one of those is now discountinued. Data was collected from the Byrrill Creek gauging station for the period from 1969 to 1982. Low flow index for the critical month (November) is now estimated from modelling of the discontinued Byrrill Creek gauging station, and the existing Glen Warning gauging station (201010).	Draft Water Sharing Plan, Tweed River Area Unregulated and Alluvial Water Sources, 2009 <u>http://www.water.nsw.go</u> <u>v.au/Water-</u> <u>Management/Water-</u> <u>sharing/Commenced-</u> <u>water-sharing-plans/Draft</u> <u>water-sharing-</u> <u>plans/default.aspx</u>
	28/01/2010	Where is the water quality testing location at Byrrill Creek?		Joanna Gardner	BCD		Council carries out water quality testing at a site near the confluence with Cedar Creek. The Office of Water also has a gauging stations at Glen Warning.	TSC staff discussions, January 2010
	28/01/2010	Is it at Cedar Ck?		Joanna Gardner	BCD		This would be the Office of Water's Glen Warning gauging station.	TSC staff discussions, January 2010
	28/01/2010	How often is this carried out and what is tested for?		Joanna Gardner	BCD		This Office of Water has this information.	TSC staff discussions, January 2010
	28/01/2010	Would this be a requirement once a dam was built?		Joanna Gardner	BCD		Both the Office of Water and the Dam Safety Committee would stipulate the requirements for water level, water flow and water quality testing. The details of these requirements would be finalised in detail as part of the EIS and licensing processes.	TSC staff discussions, January 2010
	28/01/2010	Does Council monitor flow quantity and quality into and out of CHD?	Phone	Joanna	CHD		Yes, there are almost a dozen points along the dam and in the upper Doon Doon Ck	Refer to map distributed
	28/01/2010	How often is this carried out and what is tested for?		Joanna Gardner	СНD		This depends on the particular site, but there are a range of physio-chemical, microbiological, nutrient and water level & flow parameters measured. These range from instantaneous water level monitoring through to weekly, monthly or other	TSC staff discussions, January 2010
	28/01/2010	Are there records that are accessible?		Joanna Gardner	CHD		Council controls a database of historical data. Council is required to report this information annually to the Office of Water as part of its KPI reporting (Key Performance Indicators).	TSC staff discussions, January 2010
	29/01/2010	On the 7 December 2009 I asked the question: "Whether an expert Independent Review of the consultancy team's four water augmentation options should be considered. Such a Review would support the CWG's final deliberations on this matter." Further concern about an independent expert review was raised by another CWG member at our last meeting on the 18 February 2010. WaterTSC advised in December 2009 that: "an expert review of the entire process and EIS recommendations will be carried out be an independent consultant to give Council further certainty before applying for development approval." If Council is serious about an Independent Review then a reputable institution like the Institute for Sustainable Futures, University of Technology Sydney should be requested to carry out this expert review and not just another water consultancy.	IEmail	Richard Murray	Coarse Screening		All work to date has been carried out by independent experts. The reports supplied to you thus far show the breadth and depth of that independent expertise and have included information from all of the following experts: Montgomery Watson Harza, NSW Public Works, Hunter Water, SunWater, Water Solutions, Southern Cross University, Converge Heritage & Community, Greenloaning Biostudies, Eco-sure Environmental Consultants, Tweed Landcare Inc., and Peter Parker Environmental Consultants. In additional, Council has been receiving advice from other government authorities such as NSW Office of Water, NSW Fisheries, National Parks, NSW Forestry, Catchment Management, NSW Health, and others. Over and above all this, Council's initial advice stands that "an expert review of the entire process and EIS recommendations will be carried out be an independent consultant to give Council further certainty before applying for development approval." If part of the CWG's recommendations is that additional independent review be sought at an earlier stage, the CWG can suggest this in its report however an independent review	TSC staff discussions, January 2010



No.	Date	Question	Received	Received	Theme	Secondarv	Status / Answer	Source / More info
			by:	from:		,		
28.2	29/01/2010	There is no current Council plan to maximise the reuse of 92 % of reclaimed water now discharged into the Lower Tweed Estuary. A purple pipe system similar could reuse reclaimed water in the new residential developments at Cobaki Lakes (10,464); Bilambil Heights (6881); Kings Forest (10900); Terranora Area 3071: West Kingscliff (2687) and in some of the projected infill areas (25896) totalling 157048 in 2036.	Email	Richard Murray	Demand Managem ent		Council has investigated alternative supply schemes (such as reuse schemes) before embarking on this Water Supply Augmenetation project. Reuse in particular has been investigated in detail in the Stage 1 Demand Management Strategy which went on public exhibition and you commented on in 2008. The Stage 1 report looked at the possibility of introducing recycled water in a 'three-pipe system' to supplement 'future major greenfield development sites' at Cobaki, Bilambil heights, Area E (Terranora), Kings Forest and West Kingscliff. A three-pipe system would include a pipe for drinking water, one for sewage and the third to transport recycled water from wastewater treatment plants. The study concluded that although this system would save the equivalent amount of water as the 'rainwater tank' option, both the upfront and ongoing costs of providing a three-pipe network and establishing membrane treatment was significantly higher. These overall combined costs to the community, developers and council were approximately twice that of the rainwater tank option from a long-term financial perspective - in excess of \$30 million over a period of 20 years. A further two major options considered included the combination of rainwater tanks and recycled water, and an indirect potable re-use option (which would involve returning recycled water to the Clarrie Hall Dam to be collected and re-treated as part of normal drinking water). Both of these options were ruled out due to prohibitive costs. From an environmental perspective, both recycled water options reduced effluent flows to the waterways but only by about 10 per cent and a considerable amount of energy would be required to treat and transport the water. The membrane treatment processes and pumping systems consume enormous amounts of energy which in turn produce significant greenhouse emissions. The total cost involved with implementing the indirect potable re-use option was found to be in excess of \$184 million.	Demand Management Strategy - Stage 1
28.2	29/01/2010	 Council does not acknowledge or support the increasing re use of reclaimed water. Tweed shire Council should consider the following projects Australia's largest residential recycled water scheme is at Rouse Hill in Sydney's northwest; Homes in north Adelaide are being fitted with the purple-colour pipes to deliver recycled water to toilets and outdoor taps, similar to the dual-reticulation water supply pipes at Mawson Lakes. Water Sector News 29.01.2007 - The Victorian Government will mandated to have RECYCLED WATER in all new residential estates. More than 40,000 new homes in Melbourne's outer east will be required to connect to recycled water in an attempt to save 4000 ML/yr. AWA Water News 17 September 2006 - GOLD COAST CITY COUNCIL won the International Water Congress in Beijing for the PIMPAMA COOMERA Master Plan which aims to save up to 84% through use of Class A+ recycled water and rainwater. 	Email	Richard Murray	Demand Managem ent		The list relates to other authorities with regard to their demand management strategies which you've consider to be best practice. It is also worth noting that despite these best practice demand management measures, all of these authorities have supply augmentation strategies which include dams and or desalination plants. For example South East Queensland have interconnected their dams (which has increased yield by 20%), have built Tugun Desalination plant are constructing Wyaralong Dam and are now proposing to build additional desalination plants. Sydney Water have increased the capacity of Warragamba Dam by accessing water below the bottom water level and are constructing a desalination plant at Kurnell. These other authorities have also found that demand management will delay but not eliminate the need for a new supply option.	TSC staff discussions, January 2010
28.3	29/01/2010	A population of 157,048 Tweed persons would generate approximately 14,330 million litres reclaimed water annually in 2036. This reclaimed water could replace drinking water now being used in gardening and outside activities. Current production of drinking water is approximately 10,500Ml per annum. It is estimated that 20,280 ML/annually of drinking water will be required in 2036 for a population of 157048 with a forecasting that each person uses 354 litres/capita/day. Other nearby water supply authorities are adopting a more cautious water use plan. As an example AWA Water Sector News – reported on the 16.12.2009 - WATER USE for Melbourne is subject to Target 155 campaign so that people must save water.	Email	Richard Murray	Demand Managem ent		These figures have compared TOTAL per capita water use with RESIDENTIAL per capita water use. The total per capita water use is calculated by dividing the total amount of water used by homes, businesses and others in the Shire by the total population. The predicted demand managed consumption for the Shire in 2036 is 14,859ML/annum which equates to approx 259L/p/yr (14859 / 157048 / 365). If we just look at residential demand then this equation becomes 9700 / 157048 / 365 = 169L/p/yr. It is this number that we should be comparing with the Target 155 campaign you refer to. Refer also to the answer to question 22.1	Demand Management Strategy



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No.	Date	Question	Received by:	Received from:	Theme	Secondary	Status / Answer
28.4	29/01/2010	Loss of drinking water through water leakage, theft etc Tweed Shire Council IWCM update for council's January 2010 meeting reports that the present leakage index equates to 13% to 15% for unaccounted water. Council's (IWCM- March 2006) target was to reduce water loss to 12% by 2010. Council's current target for Non Revenue Water remains at 12%. The loss of Non-Revenue Water in 2006 was 1274 ML per annum. In 2036 the drinking water loss is forecast at 2735 Million Litres annually. Sad that Tweed Shire Council is not implementing a similar program as below. Several years ago Gold Coast Council introduced a program of reducing the water pressure in the mains pipelines, in order to reduce leakages and pipe failures. So far the results have been fantastic – water leakage has been reduced by 7.34 million litres per day and there has been a reduction of 42% in the number of pipe bursts! The program is continuing to extend across the city. There are 60 specific areas throughout the city and 42 have been done so far. Works are scheduled in Nerang early in 2011 (yes, I know, a full 12 months away). The pressure reduction wont impact upon residents or businesses.	Email	Richard Murray	Demand Managem ent		Gold Coast City Council (GCCC) – Reducing Water Leak working hard to reduce leaks. However, TSC also has a detection and system replacement, which is being enhan computer based modelling and experimenting with altern such as pressure and flow reduction. Initial testing for le- involve Council staff carrying out testing late at night and usage is very low to see if unaccounted water is escaping testing and discrepancies found at Tweed Heads a firm h specialised sound testing techniques to pinpoint any sign repaired. However as described in the article about Nera time, and the analysis and replacement requires significal carefully planned so as not to disrupt supply.
29.1 29.1	28/01/2010	I am concerned that there is an error in the calculation of the volume for CHD. If the existing dam has a capacity of 16,000ML how can the new dam have a capacity of 42,300ML when the increase in depth is only 8.5m?	Meeting	Tony Thompson Tony Thompson	CHD		 These calculations have been undertaken using accurate computer modelling by dam design consultants. Due to the existing and new water bodies these calcuations are diffianything other than a computer model. Tony, Robyn and Tim made some rough calculations in a the consultant's figures were acceptable. 1) According to Council's GIS system, the surface area of 4,5000,000m2. This was confirmed as correct by Tony, calculation. The surface area of the existing CHD based Lands Dept map was approx 1,500,000m2. 2) Volume of the water above the existing surface area is 12,750,000m3 3a) One estimate of the volume of the remaining new storay depth of inundation of 4.25m> (4,500,000 - 1, 12,750,000m3) This would give a total volume for the new storage of 12, 16,300,000 = 41,800,000m3 = 41,800ML This result is very close to the 42,300ML estimated using modelling. 3b) Tony requested another more conservative estimate assuming an average depth of 2.8m (one third of the 8.5m)
							resulted in a volume of $(4,500,000 - 1,500,000) \times 2.8 = 8$ storage. This would give a total volume for the new storage of 12, 16,300,000 = 37,550,000m3 = 37,550ML. This represenvolume calculated using accurate survey and computer r the rough nature of the checks would appear to be a very Tony was supplied with a detailed 2m contour map in A0 wished.
30.1	01/02/2010	Is it possible to provide maps showing private owned land, the land owned by Council, and National Parks land at the two dam sites	Site visit	Various	Stakehold ers		Maps attached.
31.1	02/02/2010	Essential protection of the Tweed River's health; the provision of non interrupted environmental flows; the saving of bulk stormwater and the major reuse of used water, appear to be outside Council's philosophical approach as an urgent objective, in its consideration of the augmentation of Tweed District Water Supply.	Email	Richard Murray	Water Supply	Environment	These are indeed within Council's approach. In the meet visit we have discussed environmental flows and the Twe that Council must follows existing environmental flow cor Office of Water. We have also discussed that these con more stringent in the future due to the draft water sharing dam would almost certainly result in increased environment

Status / Answer	Source / More info
Gold Coast City Council (GCCC) – Reducing Water Leakage. GCCC is certainly working hard to reduce leaks. However, TSC also has an ongoing program of leak detection and system replacement, which is being enhanced through the introduction of computer based modelling and experimenting with alternative management techniques such as pressure and flow reduction. Initial testing for leaks using 'reservoir drop' tests involve Council staff carrying out testing late at night and in the early morning when usage is very low to see if unaccounted water is escaping the system. Based on initial testing and discrepancies found at Tweed Heads a firm has been engaged using specialised sound testing techniques to pinpoint any significant leaks so pipes can be repaired. However as described in the article about Nerang, these types of testing take time, and the analysis and replacement requires significant resources and needs to be carefully planned so as not to disrupt supply.	TSC staff discussions, January 2010
These calculations have been undertaken using accurate ground survey information and computer modelling by dam design consultants. Due to the irregular shapes of the existing and new water bodies these calcuations are difficult to estimate accurately with anything other than a computer model. Tony, Robyn and Tim made some rough calculations in an attempt to confirm whether the consultant's figures were acceptable. 1) According to Council's GIS system, the surface area of the new dam is approx 4,5000,000m2. This was confirmed as correct by Tony, Robyn & Tim through rough calculation. The surface area of the existing CHD based on an underestimate from the Lands Dept map was approx 1,500,000m2. 2) Volume of the water above the existing surface area is 1,500,000m2 x 8.5m = 12,750,000m3 3a) One estimate of the volume of the remaining new storage was taken by assuming an average depth of inundation of 4.25m> (4,500,000 - 1,500,000) x 4.25 = 12,750,000m3 This would give a total volume for the new storage of 12,750,000 + 12,750,000 + 16,300,000 = 41,800,000m3 = 41,800ML This result is very close to the 42,300ML estimated using accurate survey and computer modelling. 3b) Tony requested another more conservative estimate of the volume be calculated assuming an average depth of 2.8m (one third of the 8.5m max inundation height). This resulted in a volume of (4,500,000 - 1,500,000) x 2.8 = 8,500,000m3 for the remaining storage. This would give a total volume for the new storage of 12,750,000 + 8,500,000 + 16,300,000 = 37,550,000m3 = 37,550ML. This represents a difference of 10% on the volume calculated using accurate survey and computer modelling data and considering the rough nature of the checks would appear to be a very good estimate. Tony was supplied with a detailed 2m contour map in A0 size to do further analysis if he wished.	TSC GIS system
Maps attached.	TSC GIS system
These are indeed within Council's approach. In the meetings, question register and site visit we have discussed environmental flows and the Tweed River's health, and noted that Council must follows existing environmental flow conditions set down by the NSW Office of Water. We have also discussed that these conditions are likely to become more stringent in the future due to the draft water sharing plan, and any new or altered dam would almost certainly result in increased environmental flow requirements being imposed on Council. We have also discussed, and the Demand Management Strategy goes into great depth on this, that Council has investigated the use of stormwater and recycled water to reduce demand on the potable water system.	TSC staff discussions, January 2010



Revisio	on date:	24.02.2010						
No.	Date	Question	Received bv:	Received from:	Theme	Secondary	Status / Answer	Source / More info
31.2	02/02/2010	Tweed Shire Council is planning to use only a limited range of available demand management strategies over an unsatisfactory time period. Progress in saving water has slow when you consider Tweed Shire Council's Integrated Water Cycle Management (IWCM) Strategy has been in operation since 2006	Email	Richard Murray	Demand Managem ent		There are a suite of wide ranging demand management actions that Council has either already implemented or are being proposed. Over 50% of all houses in Tweed Shire have been retro-fitted with water efficient appliances - this figure is the highest of all loca government areas along the north coast of NSW. Demand Management actions by their very nature require time for implementation. Many of the potential savings require the education of people and organisations to alter the way in which they use water. Council has recognised this and has invested in the waterwise education of school children for some 15 years. Total per capita water use has been reduced by 40% since 1991. This marked reduction in per capita water use and overall reduction in water use that has been seen over this period highlights the significant progress that has been made in this area. Further savings have been seen since the IWCM was adopted in 2006. All of this data is described in detail in the demand management strategy.	Demand Management Strategy
32.1	03/02/2010	Would it be too difficult to forecast or project were we would have been if Clarrie Hall Dam was never built, How many people could the valley have supported if Clarrie Hall Dam was not created? Could we have coped with our current population etc. A bottom line of what may have been, may help our vision of what is going to be needed.	Email	Pryce Allsop	CHD		The secure yield of the current system is 13,750ML/year (ie Tweed River, CHD and Bray Park Weir). The secure yield of the system without Clarrie Hall Dam (ie Tweed River and Bray Park Weir only) has been estimated at less than 4000ML/year, which would support approximately 30,000 residents connected to the town water supply. At the time of CHD completion in 1983 the connected population had already exceeded the secure yield of the system and was approximately 33,000.	TSC staff discussions, February 2010
32.2	03/02/2010	Sam Dawson's video was interesting, is what he said accurate ? If it's not, should it be allowed to be shown. I'm all for good information. The information provided strongly suggests that whilst we may need dams they are bad for the environment.	Email	Pryce Allsop	Water Supply		Much of the information on the options presented to the CWG has highlighted various potential impacts to the environment. In particular several of the reports prepared by experts which highlight the affect the proposed dams would have on the local environment. These are important issues that the CWG should consider, together with other social impacts in its deliberations. Refer to: Natural Heritage Trust The Restoration Prioritisation of High Conservation Value Riparian Lands of the Upper and Mid Tweed River. A Preliminary Survey Using a Rapid Assessment Approach., Northern Rivers Catchment Management Authority Byrrill Creek Riparian Rehabilitation Plan – March 2006, Peter Parker Environmental Consultants Pty Ltd Byrrill Creek Forestry Venture An Environmental Assessment of Selected Harvesting – August 2000, Peter Parker Environmental Consultants Pty Ltd Byrrill Creek Reafforestation Programme A Flora and Fauna Assessment – December 1998, Greenloaning Biostudies Pty Ltd Proposed Raising of Clarrie Hall Dam – Final Report - April 2008	Reports distributed 18.01.2010
33.1 33.2	04/02/2010	What is the height in mtres, not contour levels, of the Byrrill creek Dam and the Spill way? What is the total width of the dam running across the creek?	Email Email	Joanna Gardner Joanna	BCD BCD		At the centre point of the dam crest the wall would be between approx 35m and 40m above the existing stream. The length of the dam crest varies according to the size of the dam. It has been	TSC GIS system
33.3		2. Could I please have a map that delineate Council Land Boundaries, National Park Boundaries & Peter Van Lieshout's land. It is confusing on the dam maps	Email	Gardner Joanna Gardner	BCD		estimated between approx 270m and 340m in length. Refer to question 30.1	
33.4		3. How much land within Mebbin National is inundated?	Email	Joanna Gardner	BCD		The amount of land inundated depends on the size of the dam. The minimum area of Mebbin National Park affected has been estimated at approx 4ha, while the maximum area would be approx 21ha.	Environmental Impact Quantifier Matrix
34.1	07/02/2010	What plan does Council have to complete the retrofit of remaining houses in Tweed and carry out an audit of other high use water items?	Email	Richard Murray	Demand Managem ent		Council's Demand Management Strategy (DMS) is currently on public exhibition. Both retro-fitting and auditing have been identified as specific actions within the strategic approach. Once adopted Council will move to meet the strategies identified in the report through implementation of actions such as retro-fitting and auditing, together with a suite of other actions as identified in the DMS.	Demand Management Strategy
34.2		It is noted that the NSW Office of Water - Draft Water Sharing Plans describes total surface water entitlement of Mid Tweed River Source as 28728 ML/year. Could Tweed Shire Council provide the historic annual river flows (the Mid Tweed River/Clarrie Hall Dam) arriving at the Bray Park Weir? This may help to explain your need for a secure yield.	Email	Richard Murray	Water Supply	Secure Yield	Refer to attachment provided under question 15.3	
35.1	12/02/2010	What are the details of Option 4 that the Community Working Group is required to consider?	Email	Richard Murray			Refer to answer to question 38.2	



Revisio	n date:	24.02.2010						
No.	Date	Question	Received	Received	Theme	Secondary	Status / Answer	Source / More info
35.2	12/02/2010	The project team is yet to provide to the CWG: - Full explanation of the pipeline and groundwater components in Combination Option 4 and - Actions, council needs to complete to make groundwater, both at the local and coastal level, a dependable source of temporary supply. There has been insufficient explanation to the Community Working Group (CWG) whether the two pipeline links are indeed a realistic solution as part of Combination option 4. The SEQ Water Grid or Rous Water has not confirmed in writing that they are prepared to provide a definite temporary bulk water supply to Tweed. These pipeline water supply options may be as unrealistic as Council's Option 9 "Direct potable use"	Email	Richard Murray			Refer to answers to questions 38.1 - 38.2	
36.1	16/02/2010	Can we still ask questions because I would like it recorded that I have asked about a safety plan for any areas in danger if the Clarie Hall Dam option is chosen. The rock in this area is rent by fissures and often comprises of large boulders packed together. Any explosion near the dam wall could have a knock on effect. This should be taken into account and a safety and evacuation plan produced. I believe that this should be costed ,at least in broad terms ,before the next meeting because such a plan may be very expensive. For example having a fleet of buses standing by on blasting days.	Email	Tony Thompson	CHD		Clarrie Hall Dam foundation construction includes grout curtains that extent up to 30m into the foundation rock. The dam has been evaluated as one of the safest dams in NSW as far as the structure goes. Council has completed dam break modelling for various scenarios including flooding and earthquake. The probability of failure is extremely low. The highest Population At Risk (PAR) scenario is the dam breaking due to a massive flow with juts over 500 properties at risk. The dam under these scenarios does not fail instantaneously (there are early warning signs) and this gives Council and SES time to implement an emergency plan. Council conducts regular and thorough monitoring (both manual and automatic) of the structure. An emergency plan is in place and known by the SES and will be rolled out to the public once the Australia Government early alert system is clarified.	TSC staff discussions, February 2010
37.1	17/02/2010	Why are we looking at 36,000 MegaLitres (the larger option) when 19,000 MegaLitres is forecast for growth to 2025	Meeting				The value of 19,000ML/yr refers to the Secure Yield. The existing water system has a secure yield of 13,750ML/y and results from the combination of the Tweed and Oxley Rivers (and all tributaries) up stream of Bray Park Weir plus Clarrie Hall Dam. Secure Yield is the annual volume that can be supplied by the enitre water system with a very low probability of failure. In simple terms failure should only occur if the worst drought on record is repeated. In Tweed's case the probability of that happening is 1 in 10,000 based on 120 years of rainfall information, this includes applying water restrictions when needed. To have a secure water supply for 157,000 people we would require a system with a Secure Yield of 19,000ML/yr.	TSC staff discussions, February 2010
37.1	17/02/2010	Why are we looking at 36,000 MegaLitres (the larger option) when 19,000 MegaLitres is forecast for growth to 2025	Meeting				The figure of 36,000ML refers to the storage capacity of the largest Byrrill Creek Dam. Storage Capacity is the volume of the dam. By comparison Clarrie Hall Dam has a total volume of 16,000 ML of which 15,000 ML is available to be released. There is no specific relationship between dam size and secure yield. (ie between 19,000ML/year and 36,000ML) What can be said is that as the size increases the, the increase in yield will be less, as the catchment has not increased in size. E.g. if you keep increasing the size of the rain water tank but not the roof area connected then it will fill les frequently if at all. Additionally, the environment flow releases from a new dam on Byrrill creek are likely to be significantly larger then for Clarrie hall Dam. Therefore a larger dam is required to yield the same amount of water for use for water supply. The proposed Byrrill creek Dam is relatively shallower than CHD and will have larger evaporation losses. The rainfall at the proposed Byrrill Creek Dam is slightly less than at CHD. The smaller 16,900 ML Dam option at Byrrill Creek may be just be able to provide the additional 5,000 ML/y of secure yield required given all the above reductions. The 36,000 ML Dam option has been provided to show up front, what the largest feasible size dam that could be built at this site.	TSC staff discussions, February 2010



Revisio	n date:	24.02.2010						
No.	Date	Question	Received	Received	Theme	Secondary	Status / Answer	Source / More info
			by:	from:				
38.1	21/02/2010	The three SEQ pipeline route options are just too vague to be included in this Question Quantifier and have been described in the press in the local press of 11 and 18 February 2010 as 'Pipedreams".Discussions after our meeting indicated that a different route altogether might be chosen to connect to the SEQ water grid. You have already advised that the SEQ Water Grid Manager has not confirmed in writing whether he will guarantee water supply.Your last communication dated 24 September 2008 with QWC (SEQ Water Grid)advised:'The Queensland Government is reluctant to commit a definite supply in NSW at this stage'An indication of QWC Water Policy is shown in the revised draft of the South East Queensland Water Strategy (November 2009), (Chapter 5, Para 5.5, - Supplies to outside SEQ):" Under the System Operating Plan governing the activity of the SEQ Water Grid Manager , any supply of water to irrigators and to urban areas outside of SEQ will not be permitted to impact on the achievement of the LOS Objectives for urban customers within SEQ'. At this stage there is nothing definite in the pipeline route for the CWG to consider	Email	Richard Murray	SEQ		The SEQ pipeline option is one of the three main options to be considered in determining a preferred option. Three potential routes were proposed during the coarse screening phase and are being considered for comparison purposes to determine a preferred option. If this option were to become the preferred option, further investigation would be required to identify the actual pipeline route and the conditions of supply from SEQ. Pipeline alignments offer some flexibility in terms of overcoming potential project constraints; it is important to focus on the issues which are likely to arise for pipelines between point Y and Z. To give you a comparison with the other options: the ultimate size of the dam options will also be decided after further investigation, however the range of potential inundation areas enables the relative impacts to be compared to assis in determining a preferred option. Preliminary contact has occurred between TSC and SEQ Water and further discussion will be required before either party would be in a position to determine whether to enter into a commitment. This does not mean that the option is not possible, but certainly we have identified that the major issues for the SEQ pipeline	TSC staff discussions, February 2010
38.2	21/02/2010	The Option 4 includes: * Pipeline to Rous Water, at Ocean Shores (ranked 4th option and uncertain) * Groundwater supply (ranked 6th option) * Smaller pipeline link to SEQ Water, at Tugun Having these three contingency items in this question Quantifier and expecting considered answers listed against the Environmental and social attributes is confusing and not satisfactory.	Email	Richard Murray			Connection relate to ledislative and political factors. The contingency option has been included as a shortterm option if delays occur with the preferred option. It is not under investigation as a preferred option. We would like the CWG to provide feedback and recommendations on the potential environmental and social impacts of this option so that these can be taken into account in subsequent investigation phases.	TSC staff discussions, February 2010
38.3	21/02/2010	I consider that the Environmental and Social attributes documents are not satisfactory to reflect CWG's study of environmental and social attributes of the Tweed District Water Supply Augmentation Options. I trust that you will review the two Quantifier documents to reflect the CWG's main concerns on Environmental and Social Issues.	Email	Richard Murray			The matrices have been developed at the request of the CWG to assist members to compare the options and their impacts on a number of environmental and social issues. The list of sub-criteria was based on initial requests from the CWG and the information available to Council. At the meeting last week (15.02.2010) the CWG was asked identify additional issues that should be added to the matrices - and a number of issues were added. In our email of 19.02.2010, we also invited members to send any further issues they feel should be included. Please do so if you would like additional items included.	Impact Quantifier Matrices
39.1	22/02/2010	Now please could you explain that when the group was given its figures that the existing area of the Clarie Hall Dam was 1.4 million square meters and on your grid it starts at 2.25 million square meters. It means that all along I have been working to incorrect figures!!	Email	Tony Thompson	CHD			
39.2	22/02/2010	Also if the spillway were widened and we had a very heavy rain storm what damage could this cause downstream? According to what I have read on the internet this could be a serious problem.	Email	Tony Thompson	CHD			
39.3	22/02/2010	With regard to the matrices that we have been sent ,how are thes to be used in conjunction to the one we have been given. With regard to the given ones I would like to remind you of the error that needs correcting with reference to no carbon footprint after work would finish which as I pointed out to you has omitted to include the absorbtion factor for loss of trees also no reference has been made to the emmission of methane from the poor quality water in the bottom of the dam	Email	Tony Thompson	CHD			



Tweed District Water – Demand Management and Water Supply Augmentation Public Information Session

Wednesday 10 February 2010 South Sea Islander Room, Tweed Heads Civic Centre, Brett Street, Tweed Heads 2:00pm – 7:15pm

CWG members and Tweed Shire Council staff in attendance:

CWG	TSC
Richard Murray	Anthony Burnham
Don Beck	Tim Mackney
Cr Holdom	Dan Walton
	Sascha Piotrkowski
	Marion Martin

The information session was attended by approximately 20 members of the public who were interested in discussing the Shire's Demand Management actions and strategy, and the approach to augmentation of the Water Supply.

Some of the topics discussed and opinions raised by individuals were:

- 1. Conservation focus, concerned about dam environmental impacts, population growth is ok, concern with current planning legislation being out of step with community direction ie restrictive on both community and Council.
- 2. Tweed needs to develop water resources and hydro-electricity options.
- 3. Astonishment that Council might have difficulty gaining approval to construct Byrrill Creek Dam
- 4. Understanding and supportive of the need for augmentation
- 5. Concerns that population predictions are driving the need for a second dam. The person was opposed to Byrrill Creek on two fronts environmental (obvious reasons) and social (if Council had the political strength to put a cap on population we wouldn't need a second dam).
- 6. Environmental and recycled water focus is wanted, but need to balance with costs and legislative constraints. Concerned that Council should not ultimately be shackled by these constraints
- 7. Particularly interested in the environmental issues. Has been following the process with interest, especially the CWG through the minutes and question register. Wants CWG to "get on with it" and not concentrate on "administrative" issues.





Three attendees placed their names on the Interested Parties Register, with several other attendees indicating that they were already on the register.

The following brochures and reports were available as handouts:

- Recycled Water
 - Tweed Shire Council Recycled Water Initiative Fact Sheet No. 1
 - Tweed Shire Council Recycled Water Initiative Case Study 1
 - Tweed Shire Council Recycled Water Initiative Case Study 2
- Demand Management
 - Water Demand Management Tweed Shire Demand Management Strategy
 - Water Demand Management Progress to Date
 - Water Demand Management Reducing Water Usage
 - Water Demand Management User Pays Water Pricing 2009 2010
 - o Integrated Water Cycle Management Household Retrofit Program
 - Integrated Water Cycle Management Water Modelling Activities
 - REPORT: Demand Management Strategy Dec. 2009 by MWH
 - REPORT: Demand Management Strategy Stage 1 by MWH
 - REPORT: Demand Management Strategy Stage 2 by MWH
- Water Supply Augmentation
 - Tweed District Water Supply Augmentation Factsheet 1 Why does the Tweed need more water?
 - TSC Fact Sheet 1 Why does the Tweed need more water?
 - TSC Fact Sheet 2 Water Supply Augmentation to 2036
 - TSC Fact Sheet 3 Community consultation to determine a preferred option
 - TSC Fact Sheet 4 Community Working Group nominations
 - TSC Fact Sheet 5 Water Supply Options
 - TSC Fact Sheet 6 Short-listed Option 1: Raise Clarrie Hall Dam
 - TSC Fact Sheet 7 Short-listed Option 2: Construct Byrrill Creek Dam
 - TSC Fact Sheet 8 Short-listed Option 3: Pipeline connection to SE QLD
 - TSC Fact Sheet Questions and answers to the Project
 - REPORT: Tweed District Water Supply Augmentation Options Study Stages 1 & 2 – by MWH

• Water Savings and Education

- Tweed Shire Council Water Wise Fact Sheet 1
- o Tweed Shire Council Water Wise Fact Sheet 2
- Tweed Shire Council Recycled Water Initiative Fact Sheet 2



- Tweed Shire Council Water Wise Fact Sheet 6
- Tweed Shire Council Fact sheet 3 Rebates
- Tweed Shire Council Water Wise Fact Sheet 10 Rainwater tanks
- NSW Government How Can Greywater be used?
- Joanna Gardner's (CWG member) Byrrill Creek Landowners Information Three (3) handouts
 - Environmental Effects and Considerations for the Proposed Byrrill Creek Dam
 - An Overview of the Byrrill Creek Dam Area
 - Byrrill Creek Dam Newsletter February 3rd 2010



Tweed District Water – Demand Management and Water Supply Augmentation Public Information Session

Thursday 18 February 2010 Canvas & Kettle Room, Murwillumbah Civic Centre, Murwillumbah 2:00pm – 9:00pm

CWG members and Tweed Shire Council staff in attendance:

CWG

Tony Thompson Colleen Edwards Don Beck Cr Holdom Robyn Lemaire Joanna Gardner **TSC** Anthony Burnham Tim Mackney Dan Walton

The information session was attended by approximately 12 members of the public who were interested in discussing the Shire's Demand Management actions and strategy, and the approach to augmentation of the Water Supply.

Colleen Edwards:

- Why 40m wide spillway on 70m CHD? Can it be larger?
- Blasting issues
- Dam compensation
- \$ per kL

Jim Warburton:

- Rocky cutting community consultation no dams. Wave of community consultation. Water SE. Catchment Management Authority.
- Tweed River mid estuary and fresh water in poor condition stressed.
- Office of Water presentation. Catchment management.
- Mandatory tanks.
- Top 5 broad consultation as part rocky cutting.
- Community NO DAMS.
- River already unhealthy. Fresh. E.g. red alert nutrients.
- Does the fish ladder work?
- Take rocky cutting dam off the list.
- Byrrill Creek Dam take off the list and sell land.
- Forest Plantation reduces biodiversity.
- CAP need to work to it. Policy Statement no cross catchment.
- Need high flows for down stream area.
- Disconnect between the coastal and upper catchment values.
- Existing system struggling.



- Further population should not degrade the area further e.g. have 25 x nightcap villages (vs) standard development.
- Standard development not sustainable.
- Need big RWT. 22,500 L
- Dam release temperature pollution.
- No more extraction from river.
- No more discharge to river.
- More recycling is preferred option.

Ron Duckworth:

- If CHD went ahead road alignment at McCabbes Bridge is by far the preferred alignment.
- Extra length approximately 6 7 km plus 3 crossings.
- Noting trades change travel and hours making grazing and the like unuseable.
- Recommend to spread risk e.g. water quality.
- All other alternatives.
- CHD all farming country U/S.
- BCD less developed catchment. Better water quality.
- CHD 27 properties affected approximately 18 cattle.
- Commercial impact
- Fencing required.
- Impoundment opportunity in CHD catchment at higher level but adjacent.
- Scaling of roads in Doon Doon Road and Commissioner Creek Roads to minimise sediment run off.
- Some commitments never followed through with PWD and Council.

Lady

•

- Appalled at only 4 options.
- Suspicious of process just a way of building Byrrill Creek Dam.
- Commitment not to build BCD.
- Use \$56mil to assist farmers and invest in other measures.
- TSC lagging behind
 - Grey water facilitate this process. Minimise cost.
 - Any saving water to reduce extraction.
- Storm water harvesting. Town areas recycling.
- Tweed Heads, Murwillumbah areas.
- Big buildings capture as much as possible.
- RW Tanks. Retrofit. Assistance.
- Michael Mobbs.
- Avoid supply side.
- Pipeline SEQ grid. GHG emission. High rating given desalinisation.
- BCD.

Joanna – requested information for future Uki Meeting

Why nine options? Why some not proceeded with.

Demand Management - what are Council doing? What's still to be done?



Other notes

- Individual meters for each dwelling in:
- Retirement Villages and Multi-Unit Complexes.
- Tanks compulsory for industrial.
- Tighten up "step charge".
- Encourage greywater use with reduction in sewer levy.
- Tank size based on no. of bedrooms, floor area of the house ie. not a blanket 5000L size.
- Water bills make them like energy bills i.e. water meter challenge competition to encourage water saving reductions.
- Glad to see 40% reduction in water use since 1992
- Understands future savings will require more effort per litre saved (low-hanging fruit has been "picked" to some extent)
- Surprised that Council can't force developers to implement recycled water in new developments. Queensland can do it NSW push based around BASIX
- Rainwater is the best water in the world despite what NSW Health and Australian drinking guidelines say.
- Simple DIY greywater reuse at home flexible hose attached to T-piece under laundry sink and runs out onto back lawn / garden. Changes position of hose every few days. Lawn is green as green all year round. When raining, turns valve so that water goes to sewer rather than water log yard.





The following brochures and reports were available as handouts:

- Demand Management
 - Water Demand Management Tweed Shire Demand Management Strategy
 - Water Demand Management Progress to Date
 - Water Demand Management Reducing Water Usage
 - Water Demand Management User Pays Water Pricing 2009 2010
 - Integrated Water Cycle Management Household Retrofit Program
 - Integrated Water Cycle Management Water Modelling Activities
 - REPORT: Demand Management Strategy Dec. 2009 by MWH
 - REPORT: Demand Management Strategy Stage 1 by MWH
 - REPORT: Demand Management Strategy Stage 2 by MWH
- Recycled Water
 - Tweed Shire Council Recycled Water Initiative Fact Sheet No. 1
 - Tweed Shire Council Recycled Water Initiative Case Study 1
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 - TSC Fact Sheet 8 Short-listed Option 3: Pipeline connection to SE QLD
 - o TSC Fact Sheet Questions and answers to the Project
 - REPORT: Tweed District Water Supply Augmentation Options Study Stages 1 & 2 – by MWH
- Water Savings and Education
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 - Tweed Shire Council Water Wise Fact Sheet 2
 - Tweed Shire Council Recycled Water Initiative Fact Sheet 2
 - Tweed Shire Council Water Wise Fact Sheet 6
 - Tweed Shire Council Fact sheet 3 Rebates
 - Tweed Shire Council Water Wise Fact Sheet 10 Rainwater tanks
 - NSW Government How Can Greywater be used?



- Joanna Gardner's (CWG member) Byrrill Creek Landowners Information Three (3) handouts
 - Environmental Effects and Considerations for the Proposed Byrrill Creek Dam
 - An Overview of the Byrrill Creek Dam Area
 - Byrrill Creek Dam Newsletter February 3rd 2010
- <u>Colleen Gardner's (CWG member) Clarrie Hall Dam Landowners Information</u> One (1) handout
 - Impacts on the Community of Clarrie Hall Dam (Social, Commercial and Cultural)





Tweed District Water – Demand Management and Water Supply Augmentation Public Information Session

Tuesday 23 February 2010 Pottsville Environment Centre, Centennial Drive, Pottsville 2:00pm – 7:00pm

CWG members and Tweed Shire Council staff in attendance:

CWG	TSC
Don Beck	Anthony Burnham
Rob Learmonth	Tim Mackney

The information session was attended by 5 members of the public who were interested in discussing the Shire's Demand Management actions and strategy, and the approach to augmentation of the Water Supply.

- Why lock yourself into a major option when in the near future say 5 10 years legislation etc may change to make currently ruled out or unconsidered options more feasible?
- > Great that Council is looking at both demand and supply sides of water.
- > Council engineers were at WUSD conference in QLD and are proactive that's great.
- What additional regulations would help Council to enforce more demand management actions?
- > The community has to hear more about WUSD
- > Are the options really limited to the four?

The following brochures and reports were available as handouts:

- <u>Recycled Water</u>
 - Tweed Shire Council Recycled Water Initiative Fact Sheet No. 1
 - Tweed Shire Council Recycled Water Initiative Case Study 1
 - Tweed Shire Council Recycled Water Initiative Case Study 2
- Demand Management
 - Water Demand Management Tweed Shire Demand Management Strategy
 - Water Demand Management Progress to Date
 - Water Demand Management Reducing Water Usage



- Water Demand Management User Pays Water Pricing 2009 2010
- o Integrated Water Cycle Management Household Retrofit Program
- Integrated Water Cycle Management Water Modelling Activities
- REPORT: Demand Management Strategy Dec. 2009 by MWH
- REPORT: Demand Management Strategy Stage 1 by MWH
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- <u>Water Supply Augmentation</u>
 - Tweed District Water Supply Augmentation Factsheet 1 Why does the Tweed need more water?
 - TSC Fact Sheet 1 Why does the Tweed need more water?
 - TSC Fact Sheet 2 Water Supply Augmentation to 2036
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 - TSC Fact Sheet 4 Community Working Group nominations
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 - Byrrill Creek Dam Newsletter February 3rd 2010
- <u>Colleen Gardner's (CWG member) Clarrie Hall Dam Landowners Information</u> One (1) handout
 - Impacts on the Community of Clarrie Hall Dam (Social, Commercial and Cultural)

Tweed District

Water Supply Augmentation Option Selection

Community Working Group

Site Visit, February 1st 2010 Departure: 12:00 noon sharp.

Itinerary

Item	Guide
CWG members arrive and board coach at TSC Civic Centre, Tumbulgum Rd, Murwillumbah	Stuart Waters / Tim Mackney
Depart Murwillumbah	-
Arrive Bray Park Weir	
River & environmental flows, and water extraction	Anthony Burnham, TSC
Depart Bray Park Weir	
Arrive Clarrie Hall Dam wall Lunch	
Dam wall, spillway, off-take tower, release valves Depart Clarrie Hall Dam wall	Anthony Burnham, TSC
Stop at McCabe's Bridge – inundation areas	Tim Mackney
Arrive Crams Farm Reserve (Clarrie Hall Dam)	-
Clarrie Hall Dam raising – environmental constraints	Margaret Balandin, Water Solutions, Sydney
Depart Crams Farm Reserve (Clarrie Hall Dam)	
Byrrill Creek catchment and riparian area	Tom Alletson & Mark Kingston, TSC
Arrive Byrrill Creek (proposed dam wall)	
Walk to Byrrill Creek site BYBY2 (Site Ranking 4, p86, of the Restoration Prioritisation report by Eco-Sure)	Joanna Gardner, Tom Alletson & Mark Kingston, TSC
Depart Byrrill Creek (proposed dam wall) <i>Time dependent:</i>	
Stop at forest plantation lookout in upper catchment Pause at Mebbin National Park (Cadell Rd camp ground)	Anthony Burnham Tim Mackney
Depart for Murwillumbah Arrive at Murwillumbah	
	Item CWG members arrive and board coach at TSC Civic Centre, Tumbulgum Rd, Murwillumbah Depart Murwillumbah Arrive Bray Park Weir River & environmental flows, and water extraction Depart Bray Park Weir Arrive Clarrie Hall Dam wall Lunch Dam wall, spillway, off-take tower, release valves Depart Clarrie Hall Dam wall Stop at McCabe's Bridge – inundation areas Arrive Crams Farm Reserve (Clarrie Hall Dam) Clarrie Hall Dam raising – environmental constraints Depart Crams Farm Reserve (Clarrie Hall Dam) Byrrill Creek catchment and riparian area Arrive Byrrill Creek (proposed dam wall) Walk to Byrrill Creek (proposed dam wall) Walk to Byrrill Creek (proposed dam wall) Time dependent: Stop at forest plantation lookout in upper catchment Pause at Mebbin National Park (Cadell Rd camp ground) Depart for Murwillumbah Arrive at Murwillumbah

Other requests for discussion:

- Dip sites
- Environmental costs, affect on the \$/ML



©2009 Google - Map data ©2009 MapData Sciences Pty Ltd, PSMA -

To see all the details that are visible on the screen, use the "Print" link next to the map.
Driving directions to Tumbulgum Rd, Murwillumbah NSW 2484

94.0 km – about 2 hours 43 mins Via Byrrill Creek Rd, Kyogle Rd



Murwillumbah NSW 2484

- 1. Head south-west on Tumbulgum Rd towards Old Ferry Rd
- 2. Slight right at Wharf St
- 3. Take the 1st left on to Brisbane St
- 4. Take the 2nd right on to Wollumbin St
- 5. Take the 3rd left on to Riverview St
- 6. Continue onto **Kyogle Rd**
- 7. Turn left at O'Connor Dr
- 8. Turn left to stay on O'Connor Dr
- 9. Turn right at Elouera Tce



- 10. Head north-west on Elouera Tce towards Bellevue Ave
- 11. Turn right at Bellevue Ave
- 12. Turn left to stay on Bellevue Ave
- 13. Turn left at Kyogle Rd
- 14. Turn **left** at **Clarrie Hall Dam Rd** Destination will be on the right

Clarrie Hall Dam

- 15. Head north on Clarrie Hall Dam Rd towards Kyogle Rd
- 16. Turn left at Kyogle Rd
- 17. Turn left at Doon Doon Rd

Doon Doon Rd

- 18. Head south on Doon Doon Rd towards McDonalds Rd
- 19. Turn right at Kyogle Rd
- 20. Turn left at Byrrill Creek Rd
- 21. Turn left to stay on Byrrill Creek Rd



- 22. Head south-west on Byrrill Creek Rd towards Mebbin Forest Rd
- 23. Turn left at Mebbin Forest Rd



- 24. Head north-east on Mebbin Forest Rd towards Sweetmans Rd
- 25. Take the 1st right on to Byrrill Creek Rd
- 96 Turn right to stay on Purrill Crook Dd

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15.5 km – about 18 mins
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7.1 km (@) 3.9 km (@) 2.5 km (@) 2.9 km 16.4 km – about 31 mins
5.5 km 1.6 km 7.0 km – about 21 mins
1.6 km 8.3 km

27/01/2010

Tumbulgum Rd, Murwillumbah NSW 2484 to Tumbulgum Rd, Murwillumbah NSW 2484 - Google Maps

27.	Slight left at Kyogle Rd
28.	Continue onto Riverview St
29.	Turn right at Wollumbin St
30.	Turn left at Commercial Rd
31.	Continue onto Tumbulgum Rd
01.	

Tumbulgum Rd Murwillumbah NSW 2484

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route. Map data ©2009 MapData Sciences Pty Ltd, PSMA

tumbulgum rd, mu... | murwillumbah

in 19.2 km
 in 1.0 km
 in 0.7 km
 in 0.1 km
 in 0.6 km
 in 34.0 km – about 1 hour 4 mins

TWEED SHIRE COUNCIL

TWEED DISTRICT WATER SUPPLY AUGMENTATION OPTIONS STUDY - Environmental Impact Quantifier

Environmental Attribute	Raising of the Clarrie Hall Dam	New Byrrill Creek Dam (Small)	New Byrrill Creek Dam (Large)	Pipeline connection to Seq Water Grid (Alignment A)	Pipeline connection to Seq Water Grid (Alignment B)	Pipeline connection to Seq Water Grid (Alignment C)	Contingency Option	Comments
Loss of threatned flora and fauna species	Records assessed for a 200 mts buffer zone	Records assessed for a 200 mts buffer zone	Records assessed for a 200 mts buffer zone	Records assessed for a 200 mts buffer zone	Records assessed for a 200 mts buffer zone	Records assessed for a 200 mts buffer zone	Records assessed for the pipelines. Ground water extraction areas are excluded.	
No of known records	12 Known records	52 known Records	58 known records	13 Known Records	27 Known records	24 Known Records	44 Known Records	
Loss of riparian vegetation and instream aquatic habitat (upstream)	3km Doon Doon Ck 1km Commisioners Ck Total riparian length to be determined	8.25 Byrrill Ck 4km Kunghur Ck 27.4 km total riparian length	9.0km Byrrill Ck 4.5km Kunghur Ck 41.6 km total riparian length					Based on 20m buffer on either side of main, secondary & third order streams upstream from dam wall to extent of inundation. High level of certainty.
Area in Hectares		43.6	70	0	0	0	0	
Impact on riparian vegetation and instream aquatic habitat (downstream)	1.9 km long - 3rd order	5.6 km long - 3rd order	5.6 km long - 3rd order	0	0	0	0	Based on 20m buffer either side of stream downstream to Tweed River confluence. High level of certainty
Area III nectares	0.8	19.0	19.6	0	0	0	0	
Loss of native vegetation				10m buffer on either side of pipleine route	10m buffer on either side of pipleine route	10m buffer on either side of pipleine route	10m buffer on either side of pipleine route. 90% of total Rous pipeline.	Based on vegetation management strategy mapping as @ May 2007. Excludes native plantations. Limited field survey for vegetation communities but high level of certainty due to amalgamation to determine native vegetation
Area in Hectares	123.7	61.1	117.8	1.2	1.2	2	28.8	Vegetation

Environmental Attribute	Raising of the Clarrie Hall Dam	New Byrrill Creek Dam (Small)	New Byrrill Creek Dam (Large)	Pipeline connection to Seq Water Grid (Alignment A)	Pipeline connection to Seq Water Grid (Alignment B)	Pipeline connection to Seq Water Grid (Alignment C)	Contingency Option	Comments
Loss of endangered or regionally significant vegetation	0.3 ha Endangered	5.8 ha Endangered	8.8 ha Endangered	10m buffer on either side of pipleine route. 0.9 ha Endangered	10m buffer on either side of pipleine route. 0.9 ha Endangered	10m buffer on either side of pipleine route. 0.6 ha Endangered	Rous pipeline runs through SEPP 26 Litoral Rainforest areas	Based on vegetation management strategy mapping as @ May 2007. Includes vegetation communities that are likely EECs and other vegetation communities ranked a very high and high regional status. Limited field survey for vegetation communities. Moderately high level of certainty.
Area in Hectares	21./	8.2	11.9	1.3	1.3	1.5	6	
Loss of old growth habitat Area in Hectares	1.4	21.3	37	0	0	0.6	0	Based on vegetation management strategy mapping as @ may 2007. Includes "Candidate Old Growth" and "Disturbed Old Forest" - based on regional scale (1:100000) aerial photography interpretation mapping. Moderate reliability
		T						
Loss of potential koala habitat	440.0	(0.0		10m buffer on either side of pipleine route	10m buffer on either side of pipleine route	10m buffer on either side of pipleine route	10m buffer on either side of pipleine route. No impacts expected for Rous pipeline or groundwater.	Based on vegetation management strategy mapping as @ may 2007. Potential candidate primary and secondary habitat based on vegetation communities - not koala surveys. Limited field survey for vegetation communities. Moderatelevel of certainty.
Area in Hectares	116.2	40.3	90.5	0.9	0	1.2	1.2	
Loss of cleared land				10m buffer on either side of pipleine route	10m buffer on either side of pipleine route	10m buffer on either side of pipleine route	10m buffer on either side of pipleine route. 10% of total Rous pipeline.	Based on vegetation management strategy mapping at @ may 2007. Does not include plantations. High level of certainty
Area in Hectares	71.3	81.9	127.9	5.2	3.5	11.4	3.6	
				1			1	
Loss of Native plantations								High level of certainty

Environmental Attribute	Raising of the Clarrie Hall Dam	New Byrrill Creek Dam (Small)	New Byrrill Creek Dam (Large)	Pipeline connection to Seq Water Grid (Alignment A)	Pipeline connection to Seq Water Grid (Alignment B)	Pipeline connection to Seq Water Grid (Alignment C)	Contingency Option	Comments
Area in Hectares	6.5	64.1	119.9	0	0	0	0	
								High lovel of cortainty
Loss of Exotic vegetation								nigh level of certainty
Area in Hectares	8.5	29.6	32.6	0	0	0	0	
	Jaruaalum National Dark	Mahhin National Dark	Mabhin National Dark		1		The Doue nineline would	Lligh lovel of cortainty
Inundation (Loss) of National Parks		Meddin Nalionai Park					lie in an existing road reserve running through nature reserve. Total of 8ha.	Exact extent of Rous pipeline / road reserve low moderate certainty.
Area in Hectares	3.7	3.5	21	0	0	0	8	
	Total additional area	Total area under	Total area under	Total footprint of the	Total footprint of the	Total footprint of the	Acoumoo Alignment O for	High lovel of containty
Inundation (Loss) of total land area	under inundation	inundation	inundation	pipeline assuming a 10 mts corridor	pipeline assuming a 10 mts corridor	pipeline assuming a 10 mts corridor	SEQ pipeline plus 5ha groundwater sites	High level of certainty
Area in Hectares	210	235	398	7	9	13	55	
	U/S actobrant ourrantly	Lippor optobrant water	Lippor optobrant water	ΝΑ	NA.	NA	NA	
Water Quality Impacts (Upstream / Downstream)	contributes nutrients to dam causing algae blooms, Temperature and oxygen impacts of D/S water	quality less influenced by agricultural issues - better dam water quality, Temperature and oxygen impacts of D/S water	quality less influenced by agricultural issues - better dam water quality, Temperature and oxygen impacts of D/S water					
Quality								
	1		.	1	la contra de		1	1
Water Quantity Impacts (Upstream / Downstream)	Stillwater inundation of U/S riffles, additional environmental D/S flows are probable license requirement for larger dam (improved instream flows)	New instream barrier, Significant stillwater inundation of U/S riffles, D/S flows regulated to include environmental flows which approximate natural flows	New instream barrier, Significant stillwater inundation of U/S riffles, D/S flows regulated to include environmental flows which approximate natural flows	NA	NA	NA	NA	
Availability								
	Minimal impacts	Minimal impacts	Minimal impacts	NA	ΝΔ	ΝΔ	Potential Impacts	Issues related to
Ground Water Impacts (Quantity)		ininina inipacis					depending on extraction regime	extraction of groundwater include: 1. Intrusion of brakish water; 2. Potential decrease of streamflow; and 3. Possible acid sulphate soils mechanisms associated with changes to groundwater levels
Withdrawl rates				0	0	0		

Environmental Attribute	Raising of the Clarrie Hall Dam	New Byrrill Creek Dam (Small)	New Byrrill Creek Dam (Large)	Pipeline connection to Seq Water Grid (Alignment A)	Pipeline connection to Seq Water Grid (Alignment B)	Pipeline connection to Seq Water Grid (Alignment C)	Contingency Option	Comments
Ground Water Impacts (Quality, salt water intrusion)	Minimal impacts to quality of groundwater	Minimal impacts to quality of groundwater	Minimal impacts to quality of groundwater	NA	NA	NA	Potential salt water intrusion issues in coastal aquifers	
Salinity etc.				0	0	0		
Greenhouse Gas footprint	High GHG emissions during construction and clearing. Some ongoing methane production due to rise/fall water effects. Permanent loss of carbon sink due to vegetation clearing.	High GHG emissions during construction and clearing. Some ongoing methane production due to rise/fall water effects. Permanent loss of carbon sink due to vegetation clearing.	High GHG emissions during construction and clearing. Some ongoing methane production due to rise/fall water effects. Permanent loss of carbon sink due to vegetation clearing.	Low GHG emissions during construction and clearing. High ongoing energy use for pumping by Tweed and SEQ (and potentially for water production at desal. plant)	Low GHG emissions during construction and clearing. High ongoing energy use for pumping by Tweed and SEQ (and potentially for water production at desal. plant)	Low GHG emissions during construction and clearing. High ongoing energy use for pumping by Tweed and SEQ (and potentially for water production at desal. plant)	Low GHG emissions during construction and clearing. High ongoing energy use for pumping by Tweed, Rous and SEQ (and potentially for water production at desal. plant)	Low level of certainty.
Vegetation cleared (Hectares)	138.7	153.1	270.1	1.8	5.5	1.6	51.4	
Impacts during Construction	Erosion and sedimentation when clearing inundation area, Construction traffic / noise at dam wall and Doon Doon Creek Rd, vegetation clearing for access to wall, need to partially drain CHD	Erosion and sedimentation when clearing inundation area and constructing coffer dam, Construction traffic / noise at dam wall and Byrrill Creek Rd, vegetation clearing for access to wall	Erosion and sedimentation when clearing inundation area and constructing coffer dam, Construction traffic / noise at dam wall and Byrrill Creek Rd, vegetation clearing for access to wall	Acid sulfate soils during excavation for pipeline, vegetation clearing for access, Construction traffic / noise along and to route	Acid sulfate soils during excavation for pipeline, vegetation clearing for access, Construction traffic / noise along and to route	Acid sulfate soils during excavation for pipeline, vegetation clearing for access, Construction traffic / noise along and to route	Acid sulfate soils during excavation for pipeline, vegetation clearing for accesses, Construction traffic / noise at each site	Summary of potential impacts.
Various								

TWEED SHIRE COUNCIL

TWEED DISTRICT WATER SUPPLY AUGMENTATION OPTIONS STUDY - Social Impact Quantifier

Social Attribute	Raising of the Clarrie Hall Dam	New Byrrill Creek Dam (Small)	New Byrrill Creek Dam (Large)	Pipeline connection to Seq Water Grid (Alignment A)	Pipeline connection to Seq Water Grid (Alignment B)	Pipeline connection to Seq Water Grid (Alignment C)	Contingency Option	Comments
Number of affected properties requiring compensation	Due to land acquisitions for inundation of land or road deviation construction.	Due to land acquisitions for inundation of land or road deviation construction.	Due to land acquisitions for inundation of land or road deviation construction.	Unknown, but expected that pipeline can be positioned to mitigate impacts.	Unknown, but expected that pipeline can be positioned to mitigate impacts.	Unknown, but expected that pipeline can be positioned to mitigate impacts.	Unknown, but expected that pipelines and borefields can be positioned to mitigate impacts.	Numbers assume highest dam inundation levels. Includes properties affected if road deviation between Doon Doon Rd & Commissioners Creek Rd
No of known records	24	9	12	0	0	0	0	occurs.
Number of residents affected by compensation	Land is rural, single residence.	One property is an M.O.	One property is an M.O.	Unknown, but expected that pipeline can be positioned to mitigate impacts.	Unknown, but expected that pipeline can be positioned to mitigate impacts.	Unknown, but expected that pipeline can be positioned to mitigate impacts.	Unknown, but expected that pipelines and borefields can be positioned to mitigate	Estimated from number of residences and approx known inhabitants based on visits.
No of known records	60	30	35	0	0	0	0	
Number of residences inundated / lost	One residence directly impacted, two residences near flood inundation level 77AHD.	Two privately owned residences inundated. Two additional TSC owned residences	Two privately owned residences inundated. Two additional TSC owned residences	No direct impact expected.	No direct impact expected.	No direct impact expected.	No direct impact expected.	Numbers assume highest dam inundation levels.
No of known records	1 - 3	2	2	0	0	0	0	
Number of properties severed into two (or more) areas	Inundation severes direct overland connection, access via alternative route.	Inundation severes direct overland connection, access via alternative route.	Inundation severes direct overland connection, access via alternative route.	No direct impact expected.	No direct impact expected.	No direct impact expected.	No direct impact expected.	Properties where cross- property access to all areas is severed, thus requiring alternative access and/or infrastructure to remain viable. Numbers assume
No of known records	8	2	2	0	0	0	0	highest dam inundation
Total land inundated / lost	This is the additional land inundated around the existing water storage						Assumes Alignment C for SEQ pipeline plus 5ha groundwater sites	
Land area (hectares)	210 ha	235 ha	398 ha	7 ha	9 ha	13 ha	55 ha	
Loss of Regionally Significant Farmland	Low-lying areas upstream of the existing dam have been labelled Regionally Significant.	Oha	Oba	Oha	Oba	2ha	2ha	Farmland is categorised into State significant, Regionally significant and Other rural land by state government agencies. Accuracy of boundaries is moderately reliable.
	2311a	υπα	Ulla		Ulla	211a	211a	
Loss of Grazing land								Information is taken from the environmental matrix (cleared areas) and Agricultural suitability layer (GIS) for pipeline options. Assumes 5ha for

Social Attribute	Raising of the Clarrie Hall Dam	New Byrrill Creek Dam (Small)	New Byrrill Creek Dam (Large)	Pipeline connection to Seq Water Grid (Alignment A)	Pipeline connection to Seq Water Grid (Alignment B)	Pipeline connection to Seq Water Grid (Alignment C)	Contingency Option	Comments
Land area (hectares)	71.3	81.9	127.9	0	0	0	5	groundwater site.
		1	1	T	T		1	Information is taken from
Loss of commercially Forested land								the environmental matrix.
Land area (hectares)	6.5	64.1	119.9	0	0	0	0	
Loss of other productive land								
Land area (hectares)	0	0	0	0	0	0	0	
Properties affected by public road alignment / access issues	Up to 3 directly impacted by road realignments / replacements. Potentially 7 adversely impacted by increased travel time, and approx 25 positively impacted by reduced travel time.	4 directly impacted						Properties which would be affected by changes to the public road system.
No. properties				0	0	0	0	1
Private or commercial groundwater bores impacted	No direct impact expected.	No direct impact expected.	No direct impact expected.	No direct impact expected.	No direct impact expected.	No direct impact expected.	Potential impacts from localised drawdown effects.	Unknown, but unlikely to affect a significant number of other boreholes, nor over a large area as long
No of extractors	0	0	0	0	0	0	0-10?	as extraction rate is
Non-Indegenous Cultural Heritage sites No of known records	Crams farm partially inundated.							
								This set along the set of a set
"Cultural Landscape" value lost								This relates to a deep connection of a spiritual nature to the land. The figures shown are the
Land area (hectares)	210 ha	235 ha	398 ha	7 ha	9 ha	13 ha	55 ha	total area of land lost.
Reduced water autonomy / Increased water restrictions	No change. Tweed's water restriction regime to remain.	No change. Tweed's water restriction regime to remain.	No change. Tweed's water restriction regime to remain.	Likely that SEQ restrictions would apply to Tweed.	Likely that SEQ restrictions would apply to Tweed.	Likely that SEQ restrictions would apply to Tweed.	Likely that SEQ and Rous restrictions would apply to Tweed.	



Technical Note 2: Large Stand Alone Rainwater Tanks

Prepared for Tweed Shire Council

February 2010



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Tweed Shire Council

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This document contains information about MWH, particularly about the culture of our organisation and our approach to business, which would be of value to our competitors. We respectfully request, therefore, that it be considered commercially sensitive.

In line with our Quality System, this document has been prepared by Kelly Devrell and reviewed by Shane O'Brien and signed off by Mark Hunting.

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1 Introduction

MWH was commissioned by Tweed Shire Council (TSC) in January 2010 to investigate the environmental benefits, and technical and legislative factors for a property to disconnect from the water supply network and rely solely on rainwater.

Rainwater tanks have a long history of use in Australia, predominantly in rural areas (farms and towns) which often depend upon them for household water. More recently the use of tanks has grown in urban areas, driven by State or local government policies or programs (i.e. rebates) to encourage their use and by home owners' personal choice.

The general public perception is that rainwater is safe to drink. In most areas of Australia, the risk of illness arising from consumption is low, providing it is visually clear, has little taste or smell and, importantly, the storage and collection of rainwater is via a well maintained tank and roof catchment system. While the risk from consuming rainwater is low in most areas of Australia, the water from domestic tanks is not as well treated or managed as the major urban water supplies. The microbial quality of water collected in tanks is not as good as the urban supplies. In a limited number of areas, specific industries or very heavy traffic emissions may affect the chemical quality of rainwater.

Rainwater can be used as a source for hot water services, bathing, laundry, toilet flushing, or gardening. These uses represent lower risks to public health than drinking rainwater. Irrespective of how tank rainwater is used, water quality is dependent on implementing a sensible maintenance program. However, while maintenance requirements are not particularly onerous, in practice most roof catchments and rainwater tanks are poorly maintained. This may reflect the notion that rain is a relatively pure source of water and it may be related to the fact that in many rural areas, the availability of water is a bigger issue than quality. (enHealth, 2004)

The environmental advantages of using rainwater tanks include reduced stormwater flow and pollution which has water quality benefits for the receiving waters and reduced potential for wet weather sewage overflows due to reduced ingress of rainwater into the sewerage network.

This document investigates the feasibility of using large stand alone rainwater tanks as a sole supply and includes the current use of rainwater tanks in Australia, the size of tank required in Tweed to be independent of the reticulated water supply network, the water quality issues associated with rainwater, costs involved and the necessary operation and maintenance.



2 Current Position

TSC currently has a rainwater tank policy requiring dual supply rainwater tanks to have a minimum storage capacity of 4.5 kL and a minimum roof area catchment of 50 m². The Demand Management Strategy - Stage 1, recommends Council adopt requirements in excess of NSW Government's Building and Sustainable Building Index (BASIX). Through agreement, new developments would install dual flush toilets, 3 star showerheads and 5 kL rainwater tanks with a minimum roof catchment area of 160 m², connected to external, toilet flushing and cold water to washing machines.

Shown below are a number of case studies showing how large rainwater tanks are currently being used in Australia. The case studies use an integrated approach combining groundwater, greywater, recycled water and rainwater to augment their supply, and are thus not completely self-reliant on rainwater tanks.

In addition to these case studies there is also the town of Miriam Vale in Queensland which relies on rainwater tanks for internal uses due to the very poor quality of the potable supply and Marion Bay in South Australia which switched to desalinated water in 2007 as a better quality more reliable water source after being reliant on rainwater for years.

There are also projects which capture rainwater runoff from a number of properties and divert this into either a communal rainwater tank or into the raw water supply. Again, this rainwater is used to augment other water sources and not as the sole water supply.

2.1 Case Studies

2.1.1 Healthy Home – Gold Coast

The Healthy Home Project brought together Queensland's leading Universities and Government Departments in a joint venture with industry partners.

Driver: Environmental showcase building

Rainwater End-Use: Laundry, kitchen, bathrooms and garden sub-surface watering system.

Recycled/ Grey Water End-Use: The house also contains a greywater system and a water flow control system which reduces water use by up to 50 per cent.

Time in Operation: Unknown

Rainwater Tank Size: 22.5 kL

Rainwater Tank Treatment: First flush device, filters, Ultraviolet (UV) disinfection

Issues / Key Elements: There is also a manually controlled mains refill capacity for when the stored rainwater runs low.

2.1.2 Living Laboratory – Currumbin Ecovillage

The Living Laboratory, as with all homes in The Currumbin Ecovillage, is completely water selfsufficient.

Driver: Environmental showcase building, opted not to connect to reticulated water and sewer supply

Rainwater End-Use: Potable water supply utilised for drinking, cooking, washing up, bathing / showering.

Recycled/ Grey Water End-Use: Toilet flushing, gardens / lawn, clothes washing, car washing supplied by recycled water from the Ecovillage Water Reclamation Plant

Time in Operation: Since November 2007



Rainwater Tank Size: 22.5 kL above ground tank + 4 x 2.16 kL concrete water tanks embedded in ground and used as thermal mass¹ / water storage

Rainwater Tank Treatment: Unknown

2.1.3 Healthy Home – Canberra

The Canberra Healthy Home is in a rural location 30 km west of Canberra. The objective for the design of this house was to construct a building with the highest possible environmental credentials, it is constructed of mud brick and recycled timber construction, is independent of the electricity grid, and self-sufficient for water.

Driver: Environmental building

Rainwater End-Use: All internal.

Recycled/ Grey Water End-Use: The house also contains a greywater and sewage treatment plant which produces water of a suitable quality to use in gardening.

Time in Operation: Unknown

Rainwater Tank Size: 20 kL

Rainwater Tank Treatment: Unknown

¹ Heavyweight building materials store a lot of heat so are said to have high thermal mass, as opposed to lightweight materials that do not store much heat and have low thermal mass. Adding thermal mass within a home helps reduce the extremes in temperature experienced, making the average internal temperature more moderate year-round.



2.1.4 Capo Di Monte – Mount Tamborine

Capo Di Monte is a 46-residence (maximum equivalent population² of 100) leisure village catering for 'over-50's' on Tamborine Mountain. Each residence is self-contained with 1 or 2 bedrooms, and the development also has a community centre with swimming pool and activities rooms.

Water self sufficiency is achieved through two large community tanks with an effective rainwater storage of only 6.5 kL per residence and is made possible through using water-efficient fittings in the houses, an emphasis on sensible and conservative water use by residents, and by recycling of treated wastewater for non-potable purposes. There is also an on-site water bore to augment supply.

Driver: Sole water supply as there is no reticulated water supply or sewerage network on Tamborine Mountain, environmentally sustainable development

Rainwater End-Use: All internal except toilet flushing

Recycled/ Grey Water End-Use: Class A+ recycled water from the on-site treatment plant is used for toilet flushing and garden watering.

Time in Operation: Stage 1 completed in 2006

Rainwater Tank Size: Two 200 kL community tanks

Rainwater Tank Treatment: Pressure media filter, UV disinfection and dosed with sodium hypochlorite to provide a residual chlorine concentration.

Issues / Key Elements: An on-site water bore provides a back-up supply. An estimated 72% of internal water requirements except toilet flushing will be supplied by rainwater, with the remaining 28% from the existing on-site bore.

Other: Capital cost for the potable water supply \$312,109, with headworks charges of \$274,121 and an estimated O&M cost of \$5,110 per year (\$1.57 / kL produced).

2.2 Discussion

From the case studies it can be seen that none of the houses/developments are solely reliant on rainwater to provide their water supply with all using an integrated approach combining groundwater, greywater, recycled water and/or rainwater to augment their supply.

The highlighted projects also contain water efficient devices including flow control systems and water sensitive landscaping. These would reduce the demand significantly when compared to the demands from an existing house in Tweed that does not have water efficient devices and has an established garden. The estimated demands at the Capo Di Monte 'over 50's' village are 89 L per person per day for the potable supply and 21 L/person/day for the recycled water supply giving a total water demand of 110 L/person/day for all household houses. This is slightly less than the amount of water used per person in South East Queensland at the highest level of drought restrictions and less than half the 254 L/person/day used by existing single family residential properties in Tweed.

The Capo Di Monte village is a medium density village with small gardens and 110 L/person/day is not a realistic water demand target for existing houses in the Tweed area to achieve.

² Equivalent Population is a common way of expressing non residential water demands in terms of residential demands i.e. if the community centre has a demand ten times greater than the per person demand it will have an Equivalent Population (EP) of 10..



2.3 Current Funding Arrangements

As part of the NSW Government's \$700 Climate Change Fund, established to help business, households, schools, communities and government save energy, water and greenhouse gas emissions, the NSW rainwater tank rebate provides up to \$1500 cash back for the installation of any new rainwater storage system in residential properties in NSW.

The Australian Government is also providing Rebates of up to \$500 for households to install rainwater tanks or greywater systems. Residents in NSW are eligible for both rebates provided the sum of received payments does not exceed the total cost of the tank. A reduced payment for the NSW rebate can be requested if the total payments would exceed the cost if it were paid in full.

Rainwater tank capacity	NSW Home Saver Rebate (maximum)	Criteria	Federal Rebate – National Rainwater and Greywater Initiative	Criteria
2,000 litres – 3,999 litres	Tank Rebate – \$150 Connection to toilet(s) – \$500 Connection to washing machine(s) – \$500 Maximum total –\$1,150	Households not connected to the mains supply are eligible for a rebate for the purchase of the tank only . Rainwater tanks installed to comply with BASIX for new homes, major renovations or a pool installation are not eligible for a rebate.	\$400	Internal reuse of the water for toilet and/or laundry use
4,000 – 6,999 litres	Tank Rebate – \$400 Connection to toilet(s) – \$500 Connection to washing machine(s) – \$500 Maximum total -\$1,400	There is a limit of one rainwater tank per property. Connection to toilet and/or washing machine	\$500	
7,000 litres and above	Tank Rebate – \$500 Connection to toilet(s) – \$500 Connection to washing machine(s) – \$500 Maximum total –\$1,500		\$500	

Table 2-1: Available rebates



3.1 Methodology

To determine the potential rainwater yields for a range of tank sizes and roof areas an analysis was undertaken using MWH's Residential Source Substitution model. The model is a daily water balance model, utilising historic climate data, annual demand and assumptions around the size and end uses connected to the rainwater tanks.

3.2 Modelling Assumptions

The models used were modified from those developed for the Demand Management Strategy and use Bray Park climate data from 1970 to 2007. Assumptions used in the model were taken from the Demand Management Strategy and are outlined below in Table 3-1.

Existing refers to existing single family residential houses in the Tweed area whereas Greenfield refers to new residential developments. Greenfield accounts generally use less water internally due to more efficient water fixtures.

	Internal Use (L/day)	External Use (L/day)	Total Use (L/day)	Total Use (kL/year)
Existing per account	549	161	710	259
Existing per person ¹	196	58	254	93
Greenfield per account	493	161	654	239
Greenfield per person ¹	176	58	234	85

Table 3-1: Residential Water Use in Tweed Shire

1 L/person/day calculated using 2.8 people per account for single family residential from the Demand Management Strategy

3.3 Tweed Climate

The Bureau of Meteorology classifies Tweed Shire Council as being in a summer rainfall zone of Australia. This rainfall zone is denoted by wet summers and low winter rainfall. This has an impact on rainfall tank sizing because the tank has to be large enough to capture the wet summer rainfall and store it to cater for the winter demand.

The majority of NSW, and some areas in Victoria and Tasmania are classified as being in an uniform rainfall zone whereby a smaller tank could cater for the demand as it is being topped up relatively uniformly throughout the year.

The annual and average monthly rainfalls at Bray Park for the period 1970 – 2007 are shown below in Figure 3-1 and Figure 3-2 respectively. The seasonal fluctuation described above can be seen in Figure 3-2 while significant yearly variations in total rainfall are shown in Figure 3-1.





Figure 3-1: Annual Rainfall



Figure 3-2: Average Monthly Rainfall

3.4 Yield Assessment Results

Rainwater tanks of various sizes were simulated for roof areas of 100, 200 and 300 m^2 connected roof area. The results of these simulations are shown in Figure 3-3.





Figure 3-3: Average Annual Yield Analysis for Rainwater Tanks

It can be seen that for a Greenfield single family residential property a 100 kL tank connected to 300 m² of roof area would be required to meet 100% of the family's demand. A slightly larger volume tank of 110 kL would be required to take account of the less water efficient fixtures in an existing property compared to a new Greenfield property. Although there are larger industrial size rainwater tanks available, 110 kL is approximately equivalent to five 22.5 kL tanks, (one commercially available 22.5 kL tank has a diameter of 3.73 m)and would be extremely difficult to locate on an average suburban block.

The figure also illustrates that for a given roof area and demand, there is a 'point of diminishing returns' in tank size, where increasing the size further does not provide a significant increase in yield.

The tank volume over the period 1970 – 2007 for a 110 kL tank connected to 300 m² of roof area supplying 100% of demand for an existing single family residential property is shown in Figure 3-4. It can be seen that the tank runs out of water once during this period and is frequently full and overflowing. The rainwater tank model assumes a fixed internal demand and a seasonal demand based on irrigation requirements, it does not assume any self-imposed restrictions or changes to those demands whereas in reality, if there is a period of reduced rainfall and the volume in the tank is getting low householders would most likely manage their demands more carefully in order to preserve their only water supply source. The consequence of failure of a large stand alone rainwater tank is however very minimal as water carting is always available although this will be at an additional cost.





Figure 3-4: Tank Volume over time for 110kL tank using existing demand

In comparison to the Levels of Service for the reticulated water supply from Clarrie Hall Dam, Department of Water and Energy (DWE) guidelines in respect to levels of service for water supplies and water restrictions due to drought are described by the 5/10/20 rule. This rule underpins the reasonableness of drought restrictions. Levels of Service under this rule are defined as follows:

- Restrictions implemented no more than 5% of the time, on average;
- Restrictions imposed no more than once every 10 years on average; and
- Demand reductions during drought restrictions should be 20%.

From the 2009 Tweed Shire Council Drought Management Strategy, which analysed the performance of Clarrie Hall Dam from 1986 to 2007, it is clear that the carting ban (imposed when the dam falls to 90%) will occur regularly (approximately once every two years). Water restrictions however have occurred only once in the past 20 years, during the drought of 2002, which is the worst on record and brought Clarrie Hall Dam down to its lowest level of 35% capacity. It is therefore believed that the level of service will meet the 5/10/20 rule for the foreseeable future. During the period 1986 – 2007, Clarrie Hall Dam fell below 40% only once in early 2003.

Assuming no flow in the system, Clarrie Hall Dam would fail in 14 to 15 months at 2008 demand levels and in around 12 months under 2018 demands. This case assumes zero inflow to Clarrie Hall dam and zero flow in the Tweed and Oxley Rivers. This is the worst case scenario and the probability of occurrence is very low as there has always been some level of flow in the Tweed system based on the available records spanning around 120 years. Compared to a large stand alone rainwater tank, the consequences of failure of Clarrie Hall Dam are major and contingency options to supply customers under a total failure scenario or to provide a back up supply if the dam reaches critical levels were also reviewed as part of the study.

If the period of 1986 – 2007 is examined, it can be seen that as long as appropriate restrictions are implemented, both Clarrie Hall Dam and a large stand alone rainwater tank have the capacity to continue to supply water throughout the modelling period. However, during this period, Clarrie Hall Dam only fell below 40% capacity once and restrictions were only applied once. The large tank however, failed once and almost failed on one other occasion. It is likely that the household would need to restrict their water use on these occasions. The large stand alone rainwater tank also fell below 40% capacity on 10 occasions during the period 1986 – 2007.



In 2006, SunWater analysed the security of the Tweed River water supply system using climate data from 1890 to 2004. This was a theoretical historic no failure yield analysis which determines the annual volume of water (in ML/year) that can be supplied, without failure for every year of the analysis. This analysis showed that using DWE criteria and assuming 20% demand reduction during drought restrictions the level of Clarrie Hall Dam would have dropped below 40% on only two occasions, once during the 1902/03 drought and again during the 2002/03 drought. Compared to the Drought Management Strategy the probability of Clarrie Hall Dam falling below 40% capacity is reduced to 1 in 100 years.

Therefore, although water restrictions would be required for both systems, the probability of failure of a large stand alone rainwater tank as the sole supply is far higher than for the reticulated water network supplied by Clarrie Hall Dam.



4 Water Quality Issues

4.1 Regulatory Requirements

While no specific legislation regulates rainwater harvesting and reuse, a large stand alone rainwater tank will be required to comply with a number of relevant legislative and non-legislative regulatory requirements. These along with other relevant reference documents are listed in Table 4-1.

Type of Document	Name	Key Issues
Water Management Act 2000 Legislation		Entitles householders to capture rainwater i.e. the States rights to water do not extend to private roofs. This is a NSW Act and this right is not the same in all States.
Standards	AS/NZS 3500 Plumbing and drainage	Technical standards for installation
Guidance on Use of Rainwater Tanks (enHealth, 2004)		Information is provided on the range of potential hazards that can threaten water quality, preventive measures that can be used to prevent these hazards from contaminating rainwater, straightforward monitoring and maintenance activities, and, where necessary, corrective actions.
Guidelines	Australian Drinking Water Guidelines (NHMRC & NRMMC, 2004)	The ADWG provide a Framework for management of drinking water quality based on a preventive, risk management approach.
	Rainwater Tanks Where a Public Water Supply is Available - Use of (NSW Health, 2007)	In urban areas NSW Health supports the use of rainwater tanks for non- drinking uses. NSW Health recommends that people use the public water supply for drinking and cooking because it is filtered, disinfected and generally fluoridated.
	NSW Code of Practice for Plumbing and Drainage (CUPDR, 2006)	
Other Reference Documents	Rainwater Tank Design and Installation Handbook (MPMSAA, 2008)	
	Research Report 39: Guidance Manual for the Design and Installation of Urban Roofwater Harvesting Systems in Australia (Edition 1) (Chapman et al., 2008a)	
	Research Report 42: Water Quality and Health Risk from Urban Water Tanks (Chapman et al., 2008b)	

Table 4-1: Regulatory Requirements and Reference Documents
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4.2 Tweed Shire Council Requirements for Rainwater Tank Installations

TSC has the following requirements for the installation of rainwater tanks:

- Submit a **Plumbing / Drainage Permit** (\$42) to Tweed Shire Council and pay an **Inspection Fee** (\$90).
- Clearly label any pipes and taps as 'rainwater'.

Note: If the tank capacity is greater than 10,000 litres and you are not in a rural area, you must also submit a Development Application to meet other building requirements.

4.3 Water Quality / Scheme Requirements

enHealth (2004) identified that collection and storage of rainwater provides the opportunity for a number of microbial (i.e. pathogens), physical (i.e. sediments) and chemical (i.e. heavy metals) contaminants to enter the water, with microbial contaminants being the most prevalent.

Chapman et al. (2008b) reported the following water quality results from a National survey of water quality from 35 rainwater tanks from Adelaide, Brisbane, Broken Hill, Canberra, Sydney and Wollongong:

- *Microbial:* Compared to conventional urban water supplies the water supplied from the rainwater tanks tested provided relatively poor microbial water quality. Pathogens responsible for gastrointestinal infection (*Campylobacter spp* and *Salmonella spp*) were detected in 1 and 2 rainwater tanks respectively.
- Chemical: High lead concentrations were detected in six tanks. High zinc concentrations were also detected but high zinc concentrations are more of an aesthetic issue, opposed to a health issue, since it may lead to taste problems. Occasional high levels of plasticisers and herbicides were detected although further investigation is required to ascertain the prevalence in a larger sample and over a longer sample time.

Both the NSW Department of Health and enHealth (2004) advise against drinking rainwater where a reticulated water supply is available as the water quality from a rainwater tank, in particular microbial quality, may not be consistently high quality.

The following measures can be implemented to improve rainwater quality obtained from a rainwater harvesting scheme:

- Prudent scheme design (e.g. rainwater tank location, materials of construction and guttering design can all impact on the water quality);
- Use of treatment processes (e.g. leaf and debris screen); and
- Regular Maintenance (e.g. regular removal of debris and leaves from the roof and guttering).

There are a number of treatment processes that are commonly adopted to improve rainwater quality depending on the particular end use. For a number of rainwater harvesting schemesTable 4-2 compares the end uses the rainwater is used for and the level of treatment adopted for the rainwater.

With the exception of Capo Di Monte, which provides community based water supplies, the examples are for schemes providing rainwater to an individual dwelling.

A rainwater harvesting and reuse scheme may also require additional measures to prevent mosquito breeding in the rainwater tanks.



Table 4-2: Indicative Combinations of Risk Mitigation Measures Requires for Selected End Uses

Example	End Uses	Adopted Rainwater Treatment
Various Locations	Outdoor water uses	None
Gold Coast Water	Outdoor water uses Toilet flushing Laundry (cold tap)	Leaf and Debris Screen First Flush Device
Capo Di Monte (Mt Tamborine, QLD)	All water uses including drinking.	Leaf and Debris Screen Sand Filter UV Chlorine Dosing



5 Capital and Operational Costs

5.1 Capital Costs

A range of capital costs for rainwater tanks, pumps, plumbing and installation is shown below in Table 5-1. This table has been taken from a 2007 National Water Commission report, by Marsden Jacob Associates, "The cost-effectiveness of rainwater tanks in urban Australia". The results were relatively consistent for the tank itself, but the estimates of installation and plumbing costs were far more variable. In some cases, indoor plumbing is inaccessible or encased within the concrete slab of the house, making plumbing to some areas of the house cost prohibitive which explains the variability of plumbing costs shown in Table 5-1.

	2 kL tank	5 kL tank	10 kL tank	20 kL tank	Pump	Plumbing (approx.)	Installation (approx.)
Range	641-922	935- 1,349	1,621- 1,899	2,618- 2,835	240- 1,045	300-3,000	300-800
Average	732	1,080	1,656	2,852	622	885	549
Median	721	1,091	1,630	2,835	650	727	548

Table 5-1: Rainwater tank costs provided by suppliers (\$)

The Marsden Jacob report also contained a levelised cost analysis which demonstrated that in all of the cases examined, the cost per kilolitre of tank water is greater than the price currently charged by water companies and a "typical" property owner who installs a rainwater tank will, in most cases, face a net financial loss over time. To offset this loss, a rebate in the order of \$1,600 to \$4,000 would be required depending on tank size and roof size.

Using the average costs shown in Table 5-1 gives an approximate cost of \$3,150 for a 5 kL tank and \$27,000 for an equivalent 110 kL tank. This gives a capital cost of \$3.50 per kL of rainwater supplied for the 5 kL tank based on a demand of 231 L/day over 20 years (outdoor use, toilet flushing and cold water to washing machine as analysed in the Demand Management Strategy). Using the same methodology the capital cost per kL of rainwater supplied for the 110 kL tank is \$9.80 based on a demand of 710 L/day which is the existing single family residential demand shown in Section 3.2.

This is a very simplistic calculation; it does not contain any rebates, replacement of pump (expected every 10 years) or any ongoing maintenance. It is shown for comparative purposes only and shows that to supply all internal and external demands with rainwater costs approximately 2.8 times more than supplying the end uses recommended in the Demand Management Strategy with a 5 kL tank. This again highlights the effect of diminishing returns shown in Figure 3-3.

5.2 Operational Costs

Most research on operational costs of rainwater tanks has focussed on the more practical domestic tank sizes ranging from 2,000 litres (2 kL) to 10,000 litres (10 kL), which suggests that

"a typical household rainwater system supplying rainwater to the laundry, toilet and garden appears to have an average energy intensity of approximately 1.5 kWh/kL". (Retamal, 2009)

Using this energy intensity to calculate the energy requirement of a pump to supply all internal/external demand for an existing single family residential property gives:



1.5 kWh/kL x 259 kL/yr x 21.582³ c/kWh = approximately \$85 per year

Other operational costs (both financial and non-financial) include:

- regular checking and cleaning of gutters, roof catchments and tank screens, including removing overhead branches where required;
- potentially installing gutter screens or guards;
- checking the tank for sludge every two to three years and having the tank cleaned if there is a thick layer of sludge at the bottom;
- if the tank owner suspects the tank has been contaminated, the water stored in the tank may require chlorine disinfection; and
- maintenance of the water pump as required.

In contrast to the installation and plumbing for a rainwater tank, the operating and maintenance of a tank can often be undertaken by the home owner and in some cases represents a cost that would have been incurred even without the tank (e.g. cleaning of gutters).

Interestingly, the cost of the physical tank itself might account for as little as 30% of the whole of life cost if the tank is plumbed for both indoor and outdoor use. In a "typical" installation, the water pump (including replacement every 10 years) might account for around 35%, installation and plumbing 25% and ongoing operation and maintenance around 10%. (NWC, 2007)

In 2009, Gold Coast Water implemented an inspection program for registered rainwater tanks in accordance with Queensland Local Government Act 1993. Although the majority of costs associated with rainwater tanks are borne by the customer this is one example of a cost that could be incurred by Council.

³ TRU Energy NSW Electricity 5700 (peak) rate



Regular maintenance is the key to good water quality. Installing screens, filters and first flush devices will reduce contamination.

Unless adequately treated, rainwater is not as reliably safe to drink as the network water supply. It is almost impossible to completely protect rainwater from bird droppings and other debris containing micro-organisms and particularly in an urban environment, air pollution caused by nearby light / heavy industries and vehicle emissions.

Likely sources of micro-organisms and chemical contaminants that can be controlled are:

- Overhanging branches
- Soil and leaf litter accumulated in gutters particularly if kept damp for long periods due to poor drainage
- Faecal matter deposited by birds, lizards, small rodents, marsupials etc
- Dead animals and insects either in gutters or in the tank itself

It is important that roofs, gutters, screens and first flush devices be regularly inspected and cleared of leaves and other debris.

To prevent mosquito breeding, and corrosion and metal contamination, guttering and pipework should be self-draining or fitted with drainage points. Water should not be allowed to pool under the overflow outlet or tap, as these can become mosquito-breeding sites.

The tank should be a sealed unit with the lid preventing sunlight from reaching the water. Sunlight encourages the growth of algae that will taint the water. Holes and spaces will allow mosquitoes to enter. The inlet should incorporate a mesh cover and a strainer to keep out leaves and to prevent the access of mosquitoes and other insects. The overflow should also be covered with an insect proof cover such as plastic insect mesh wired around the pipe.

The most common additional treatment measures utilised in Queensland case studies include:

- Filtering through a 20 micron filter;
- UV disinfection (to ensure all pathogens were eliminated); and
- Carbon filters on cold water taps.



The suggested maintenance procedures shown in Table 5-1 are recommended by Gold Coast Water to ensure risks to water quality are minimised.

It is recommended that the tank is emptied and cleaned once every two years which would require another source of supply during this time, especially if only one large tank is used to supply all internal and external end uses. Therefore, regardless of the size of tank 100% reliability from a large stand alone rainwater tank is impossible as allowance needs to be made for emptying and cleaning once every two years.

Table 6-1: Suggested maintenance procedures

Maintenance Action	Regularity	
Check and clean mosquito net on tank overflow	October – March: every month April – September: every three months	
Check and clean first flush device	Three months	
Check roof and gutters for the presence of accumulated including leaf and other plant material	Three months	
Clear accumulated plant material	Three months	
Prune overhanging tree branches and foliage	Three months	
Check water quality – must be clear with no smell	Six months	
Check for evidence of animal, bird or insect access including mosquito larvae; if present locate and close access points	Six months	
Check tank for defects and repair	Six months	
Check for evidence of algal growth; if present, find and close points of light entry	Six months	
Ensure taps have the correct signage installed	Six months	
Clean tank to remove accumulated sediment or sludge	Two years	



The current Tweed Development Servicing Plan (DSP) for Water Supply Services makes no allowance for properties that are self-sufficient for water requiring *contributions where the anticipated development will or is likely to increase the demand for water supply services.*

As yields from rainwater tanks are susceptible to droughts there is no guarantee that connection to the reticulated water supply will not be necessary in the future to service the property.

The current water access charges from the TSC website (http://www.tweed.nsw.gov.au) are \$102 annually for residential customers. This fee applies to all land that is within 225 metres of a water main and able to be connected (whether connected or not).

A similar approach is taken in Section 311 of the *Water Management Act 2000*, which states a water supply authority may only levy water service charges on land:

(a) to which water is supplied, or

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(b) to which, in the opinion of the water supply authority, it is reasonably practicable for water to be supplied, from one of the water supply authority's water mains.



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An evaluation of large stand alone rainwater tanks is shown in Table 8-1 with some identified advantages and disadvantages of this method of source substitution. The reduced stormwater pollutant loads and peak discharge rates can also be achieved through the use of smaller rainwater tanks and these advantages are not solely applicable to large rainwater tanks.

Advantages	Disadvantages
Reduced potable water demand	Climate dependent – yield reliability calculated for average climate conditions and hence performance will reduce considerably during periods of below average rainfall
Reduced stormwater peak discharge rate and volume which reduces both flooding and erosion downstream	Cost prohibitive to supply entire internal/external demand due to size of infrastructure required to maintain 100% reliability
Reduced pollutant loads in stormwater increase the water quality and health of downstream water bodies	Large connected roof area required – not all roof area is available for use and will depend on the location of downpipes and tank location
New potable water supply sources could potentially be delayed	Required footprint for large rainwater tanks – e.g. one commercially available 22.5 kL rainwater tank has a diameter of 3.73 m and stands 2.44 m high. Existing single family residential property requires five 22.5 kL tanks to be self sufficient. Difficult to locate on an average suburban block.
Reduced potential for wet weather sewage overflows due to reduced ingress of rainwater into the sewerage network	Costs borne by customer not council
Reduced stormwater flow and pollutant loads lead to increased habitat protection for fish and other aquatic animals	Increased energy costs
Ability to be independent of reticulated supply, dams can be depleted over many years of drought and restrictions may still apply to reticulated supply although tanks contain water. Tanks can also be topped up by carting water although this will involve a cost.	May not reduce infrastructure costs if council deem that connection may occur in the future and hence demand is required to be catered for
Rainwater can be lower in salinity and hardness than mains water reducing corrosion and detergent use	Does not reduce developer charges or rates
	Maintenance is the onus of the owner not council
	Potential water quality issues
	May not be able to maintain current garden watering practices and other lifestyle choices i.e. pools/spas
	Alternative source of fluoride needs to be sought

Table 8-1: Large	Stand Alone	Rainwater	Tanks	considerations
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Advantages	Disadvantages
	More expensive to retrofit in existing houses where access issues for installation and roofs/gutter connections may not be suitable



9 Discussion

Rainwater tanks have a long history of use in Australia, predominantly in rural areas (farms and towns) which often depend upon them for household water. More recently the use of tanks has grown in urban areas, driven by State or local government policies or programs (i.e. rebates) to encourage their use and by home owners' personal choice.

TSC currently has a rainwater tank policy requiring dual supply rainwater tanks to have a minimum storage capacity of 4,500 litres and a minimum roof area catchment of 50 m². The Demand Management Strategy - Stage 1 recommends for major development that requirements above the NSW Government's Building and Sustainable Building Index (BASIX) be pursued through agreement for dual flush toilets and 3 star shower heads and the provision of 5,000 L rainwater tanks with a minimum connected roof area of 160 m², connected to external, toilet flushing and cold water to washing machines.

In addition to the examples and case studies discussed in this report, there are few examples of communities which rely solely on rainwater tanks for their permanent water supply. While none of the examples or case studies are completely self-reliant on rainwater tanks, using an integrated approach combining groundwater, greywater and recycled water to augment their supply, they are examples of how rainwater tanks are currently being used in Australia

To be totally self sufficient for water an existing average single family residential property in the Tweed area would require a 110 kL tank connected to 300m² of roof area, and an average Greenfield property with water efficient devices would require a 100 kL tank also connected to 300m² of roof area.

Currently the disadvantages of using rainwater tanks to supply all of a households demand far outweigh the advantages due to the lack of water security and economics of large stand alone rainwater tanks in areas where potable supply is available.

The Bureau of Meteorology classifies Tweed Shire Council as being in a summer rainfall zone of Australia. This rainfall zone is denoted by wet summers and low winter rainfall. This has an impact on rainfall tank sizing because the tank has to be large enough to capture the wet summer rainfall and store it to cater for the winter demand. Yield reliability is calculated for average climate conditions and hence will fluctuate during periods of below average rainfall.

A large connected roof area is required which may not be feasible on typical urban blocks that do not have large sheds or outbuildings like rural areas. Large rainwater tanks also have a large footprint (a 110 kL tank equates to five 22.5 kL tanks, which are 3.7 m in diameter and 2.4 m high) which again may not be feasible in urban areas where land availability is limited.

It is important to realise that rainwater tank cost, both capital / operating, and maintenance time are borne by the customer not the council; there are also increased energy costs associated with pump operation.

Because large rainwater tanks are susceptible to drought and not a reliable source of supply, water infrastructure will still need to be sized to cater for peak demand with no reduction due to rainwater tank usage. This also means there will be no reduction in developer charges or rates.

There are also water quality issues associated with exposure to rainwater, which require treatment and increase the capital and operating costs. Rainwater does not contain fluoride and if used as the sole source of drinking water, an alternative source of fluoride will need to be sought.

Finally, demands in this study have been taken from average demands for Single Family Residential properties contained in the Demand Management Study. If individual property demands are significantly higher than average, then current garden watering practices and other lifestyle choices may not be able to be maintained.



10Conclusions

- In urban areas NSW Health supports the use of rainwater tanks for non-drinking uses. NSW Health recommends that people use the public water supply for drinking and cooking because it is filtered, disinfected and generally fluoridated.
- To be totally self sufficient for water an existing average single family residential property in the Tweed area would require a 110 kL tank connected to 300m² of roof area, and an average Greenfield property with water efficient devices would require a 100 kL tank also connected to 300m² of roof area.
- Although there are larger industrial size rainwater tanks available, 110 kL is approximately equivalent to five 22.5 kL tanks, which have a diameter of 3.73m each and would be extremely difficult to locate on an average suburban block.
- Yield reliability is calculated for average climate conditions and hence will fluctuate during periods of below average rainfall.
- Although water restrictions do occur in the reticulated water supply network the probability of failure of the Clarrie Hall Dam is very low compared to using a large stand alone rainwater tank as the sole supply.
- The cost per kilolitre of tank water is greater than the price of water from the reticulated water supply.
- To supply all internal and external demands with rainwater costs approximately 2.8 times more than supplying the end uses recommended in the Demand Management Strategy with a 5 kL tank
- Property development and access charges will still apply.
- Because large rainwater tanks are susceptible to drought and not a reliable source of supply, water infrastructure will still need to be sized to cater for peak demand with no reduction due to rainwater tank usage. This also means there will be no reduction in developer charges or rates.
- Rainwater tank cost, both capital / operating, and maintenance time are borne by the customer not the council; there are also increased energy costs associated with pump operation.
- There are water quality issues associated with exposure to rainwater, which require treatment and increase the capital and operating costs. Rainwater does not contain fluoride and if used as the sole source of drinking water, an alternative source of fluoride will need to be sought.
- There are environmental advantages to using rainwater tanks, however these can also be provided by smaller tanks that are used to augment the existing water supply and not as the sole supply.
- Currently the disadvantages of using rainwater tanks to supply all of a household's demand far outweigh the advantages due to the lack of water security and economics of large stand alone rainwater tanks in areas where potable supply is available.



11 References

Your Home case study, Gold Coast, Queensland http://www.yourhome.gov.au/technical/fs84.html

Your Home case study, Canberra, ACT http://www.yourhome.gov.au/technical/fs814.html

Tweed Shire Council, Development Servicing Plan for Water Supply Services, July 2007

State of New South Wales, Water Management Act 2000

Smart and Sustainable Homes, Currumbin case study, April 2009, <u>http://www.sustainable-homes.org.au/03_projects/currumbin_ll/currumbin_ll.htm</u>

Environment, Climate Change and Water, NSW rainwater tank rebate http://www.environment.nsw.gov.au/rebates/ccfrtw.htm

Australian Government, Department of the Environment, Water, Heritage and the Arts, National Rainwater and Greywater Initiative, http://www.environment.gov.au/water/programs/nrgi/index.html

Bureau of Meteorology, Major seasonal rainfall zones of Australia http://www.bom.gov.au/climate/environ/other/seas_group.shtml

http://www.tweed.nsw.gov.au/Agenda21/pdfs/TSC%20Requirements%20for%20Rainwater%20 Tank%20Installations.pdf

ABC News, Marion Bay awaits Desalination Plant http://www.abc.net.au/news/stories/2007/05/31/1938784.htm

Australian Government, National Water Commission, Marsden Jacob Associates, The cost effectiveness of rainwater tanks in urban Australia, March 2007

Retamal, Turner, White, Energy Implications of Household Rainwater Systems, published Water Journal, v36 8 December 2009

Gold Coast Water, FACT SHEET Inspection Program – Rainwater Tanks, http://www.goldcoastwater.com.au/attachment/goldcoastwater/pet_tank_inspection_fs.pdf

Chapman H., Cartwright T. & Tripodi N., 2008a. *Research Report 39: Guidance Manual for the Design and Installation of Urban Roofwater Harvesting Systems in Australia (Edition 1)*, The Cooperative Research Centre for water Quality and Treatment.

Chapman H., Cartwright T., Huston R. and O'Toole J., 2008b. *Research Report 42: Water Quality and Health Risk from Urban Water Tanks*, The Cooperative Research Centre for water Quality and Treatment.

Committee on Uniformity of Plumbing & Drainage Regulations in NSW (CUPDR) 2006. *NSW* Code of Practice for Plumbing and Drainage, Sydney.

enHealth Council, 2004, *Guidance on Use of Rainwater Tanks.* enHealth Council. Australian Government Department of Health and Ageing.

Master Plumbers & Mechanical Services Association of Australia, 2008. Rainwater Tank Design and Installation Handbook.

National Health and Medical Research Council & Natural Resources and Management Ministerial Council (NHMRC & NRMMC) 2004. *Australian Drinking Water Guidelines,* Canberra.

NSW Health, Rainwater Tanks Where a Public Water Supply is Available - Use of, June 2007 <u>http://www.health.nsw.gov.au/policies/gl/2007/pdf/GL2007_009.pdf</u>

MWH, Tweed Shire Council Demand Management Strategy, 2009



MWH, Tweed Shire Council Drought Management Strategy, 2009 SunWater, Tweed River System Water Supply Security Review, 2006
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