



Central Highlands > Water.

A future-focused exploration of potential water related change and outcomes in Australia.

About this document.

This document is an executive summary of a larger body of work generated for and on behalf of Central Highlands water by Looking Up Feeling Good Pty Ltd. It seeks to share some of the key themes, ideas and questions seen in the detailed “environmental scan” document and is not intended to imply recommendations but does provide “interesting” considerations to employ when developing scenarios in the next stage of work. It is extremely important to note that this executive summary is only an extract of ideas arising from the “Environmental scan” process (ES) and may not represent all the ideas seen in the scanning document. This executive summary can therefore be viewed in conjunction as a “quick start” and the following ideas can be used to ask “How could these elements impact the way we effectively manage water in the future?”

Both the “ES” document and this executive summary are intended to provide a breadth and depth of different perspectives and considerations when thinking about the future of water. They are not predictive in their nature but rather seek to expand our view on possible outcomes and impacts.

Environmental or societal scanning is a foresight method employed to highlight emerging considerations that ought to be recognised as having the potential to change the environment that we operate within. Similar to the way a radar picks up distant but approaching objects by tuning into different frequencies, the environmental scan studies and researches a number of very different components of water and associated factors through a VSTEOP framework. (Values, Social, Technology, Economics, Environmental, and Political) The results seek to identify emerging change and key facilitators of change.

These signals can be used in addition to traditional research methods to generate alternative views and robust themes about the future. Just as some of the main factors and challenges that Central Highlands is facing today were not “mainstream news” or were not seen in the most common sources 20 years ago, the emerging factors that will have impact over the next 20 years may only be seen in faint signals. These signals slowly grow stronger and/or come from sources that are on the periphery. The research also looks outside of the local or national environment (Australia) and seeks outcomes in other countries to ask, “Could this happen here? And if so, are there unique implications?”

The ES process undertaken by Looking Up Feeling Good Pty Ltd on behalf of and in conjunction with Central Highlands aims to highlight faint signals from both mainstream and peripheral sources. The process also expands the implications that Central Highlands is aware of and able to monitor. The scanning content then allows us to analyse each faint signal (and strong signals) and asks: What is driving this change? What is behind this signal of change? How could it impact us as we navigate our way forward?

The results identify broader themes in change agents and key drivers of change. In many cases these signals do not appear initially to be related to an entity like Central Highlands. Understanding that these signals are in many instances surface level manifestations of a deeper undercurrent of change will give clues to how it might impact stakeholders directly.

The VSTEOP process represents a symbiotic relationship across the various factors ‘in play’ that are likely to (or have the potential to) shape the way the subject (Water) could develop within the given context - in this case, the year 2030.

The scanning process looks at the areas of human values, societal behaviors, technology developments and applications, economic factors, environmental and political components, and considers not only potential for specific elements to play out in certain ways, but also how the factors across each element might influence each other in

shaping the subject’s development over time.

It is important to reiterate that none of the items listed here are predictive elements attempting to state categorically what will happen. Instead, they are signals of potential change, some of which will probably grow further and others that will wane. As such, this document provides ‘things to consider’ as part of a strategic assessment of future decision making, which differs considerably from ‘things to react to’ in terms of operational activity.

Understanding the Scanning Framework

The degree to which an organisation might be considered strategically agile is directly influenced by how quickly an organisation becomes aware of, and the responds to, signals of change.

ES is a deliberate and structured process that aims to identify ‘things of interest’ that may signal the emergence of a change in an organisation’s operating environment. These things of interest (or scanning hits) are likely to include a number of items that the organisation is aware of. To be more useful as part of a scenario planning development however, it is important that the ES includes things which might be considered on the periphery, or not obviously relevant to the organisation.

High quality ES does not rely on history or information that would be considered widely known. Typically most market research or media monitoring data will provide an assessment of existing trends or ‘yesterday’s news’. Whilst a useful input, for the purpose of strategic agility it is imperative that the organisation look further a-field and further ahead in its quest for early signals of potential change.

Building on a commonly used STEOP scanning framework, Looking Up Feeling Good Pty Ltd was the first organisation in the world to develop the VSTEOP (or ‘Very STEOP’) framework for scanning. In addition it applies a Causal Layered Analysis filter to its data which looks to identify bias in the information available. In this way we are prompted to seek out ‘Confirming’, ‘Disconfirming’ and ‘Alternative’ things of interest.

The VSTEOP framework provides a significant improvement to the STEOP model for it brings the idea of ‘agency’ into consideration – the consideration for how human involvement might influence, negate, enhance or influence the data that appears in each of the other categories.

V – Values: The Values filter applied is based on the Spiral Dynamics™ model also known as Value Systems. Rather than consider things that are ‘of value’ (cars, clothes, people etc), we look for the way in which people or societies approach their day to day lives – are they attempting to shape the world to their liking or do they have a preference for compliance?; and how complex are the actions they are taking?

S – Social The Social filter seeks to consider constructs that occur within the interaction of people living in society, the norms that may exist, the ‘structures’ and icons that are identifiable and that provide meaning.

T – Technology The Technology filter focuses on both technology in a computing sense, as well as technology in the sense of ‘tools of the trade’. Where a data processing centre or mobile phone might be the norm in one part of the world, technology could just as likely be a simple water wheel or bullock drawn plough

E – Economics The Economic filter is perhaps one of the more straight forward of the filters used in the VSTEED process. It recognises or labels information based on its relevance to the financial, trade and monetary systems used within societies around the world

E – Environmental The Environmental filter looks to identify information based on its connection to the air/water/land notion in which we see all species habituating the globe. Although ‘Environmental Scanning’ is the process or ‘looking all around’, this ‘E’ filter differs in that it considers what many have come to known as ‘green’ issues

P – Political The Political filter looks at the legal and procedural nature of a society – the laws, regulations, enforcement and representative structures that enable a society to function. The ES does not consider the degree of effectiveness of those processes, merely acting to identify items likely to be representative of those processes.

Understanding the Notation System.

Every single scanning hit will be ‘tagged’. Each tag identifies the core filters considered relevant by the scanning analyst at the time of the scan. As such, each hit will have a VSTEED label preceding the headline and the reader will immediately know what core filter is in play, based on the capitalisation of the VSTEED tags.

By way of example, ‘Vsteep New approach to thinking’ would indicate that the article or information is relevant to the Values filter. Another, say ‘vsTEeP robotics shifts to downtime at work’ would suggest that the story is weighted towards the Technology, Economic and Political filters.

In this way, it is also possible to shed new light on already known data for it asks the reader to consider how the article or data might be viewed through a particular filter. This often leads to significant insights that had remained hidden until the VSTEED notation is included.

The VSTEED framework works in two directions – both as a means to categorise discovered or identified data, and also as a search guide wherein an Analyst might seek out data specific to a particular filter.



Building Relevance

Whereas the first stage of effective ES is to find information, the second stage is to analyse that information and consider its potential meaning. The Causal Layered Analysis (CLA) model enhances our ability to identify the quality of information. The shorthand approach of CLA suggests that it asks three key questions:

- ‘Who wins if I accept this point of view?’
- ‘Who loses if I accept this point of view?’
- ‘Who exactly, is doing the ‘saying’?’

These three questions help identify potential bias and those who might benefit or be negatively impacted should this line of thinking be accepted by those involved in the discussion. CLA also opens up an organisation’s awareness of information outside its typical point of view. Whereas most market research provides only that information that is immediately relevant, the combination of the VSTEED filters and the CLA model exposes a new question:

‘In what way could this information be relevant to this organisation?’

This question is fundamental to building an organisation’s capacity for strategic agility for it forces the organisation to consider potential links where previously none existed. It enables an organisation to seek relevance among seemingly disparate items of data and uncover potential connections indicative of significant potential for change. Simply, the process increases and organisation’s alertness to shifts in its operating environment, and in doing so, greatly enhances the time available for effective decision making.

Strategic agility is greatly enhanced with an improved awareness of signals for change. Viewed in isolation it is likely that the interpretations of this Environmental Scanning document will be taken out of context. The main purpose of this ES is to kick-start the thinking of participants involved in the Central Highlands Water scenario 2030 project. It should be read in that light. This ES document should also be viewed in connection to the wider Scenario Planning project undertaken by Central Highlands Water and the much broader Environmental Scanning being developed in conjunction with CHW.



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1.0 Executive > summary

After conducting a foresight appraisal of elements both directly and indirectly connected to the subject of water in Australia, a number of key themes have initially emerged that warrant close consideration when generating strategic direction. These themes often combine and interact in various ways, but ultimately when seen as whole, point to the same conclusion, we are rapidly approaching a period of unprecedented water challenges that will require actions that could seem to many as substantial.

Often these themes listed below are a combination of many different signals and viewpoints that could be discussed individually but for ease can be grouped together so we can ask "How could these elements impact the way we effectively manage water in the future?"

These key themes highlighted, as some "elements of interest" are by no means exhaustive. These themes are:

- Distribution and regulation.
- Changing climatic conditions
- Emerging solutions
- Changing water attitudes
- Methods of Operation
- Increasing requirements
- Economic commodity.
- Security
- Societal impacts

When viewed in conjunction with drivers of change emerging in our society, they provide a breadth of realistic outcomes that highlight linear approaches as too narrow. Although many of the drivers of change below have been specifically addressed in the key "water" focused themes, they must be recognised as influencing change in all spheres of society and these "shifts" could lead to additional impacts for water.

These key drivers being:

- Population growth
- Urbanisation
- Changing social attitudes
- Increasing immigration
- Aging
- Increasing governance



2.0 Key themes >

& Potential implications

Distribution and regulation –

Throughout the scanning process, questions around the challenges of distributing and regulating water resources in an efficient manner were constant. With water stocks historically held in concentrated areas, many of the emerging issues with focus on delivery to other areas and the ability to make sure the right people are taking the right amounts for the right use.

VSteeP - "Between the system's upper reaches in Queensland and the mouth at Goolwa, drought, climate change, over-allocation to irrigators, evaporation and sheer theft have all robbed the Murray of too much water. Karlene Maywald, South Australia's Minister for the River Murray and Water Security (a ministry title only South Australia could create), puts it another way: "About 62 per cent of Queensland, where the Murray–

Darling system starts, is in flood. None of that is getting down to us."

Inside.org.au

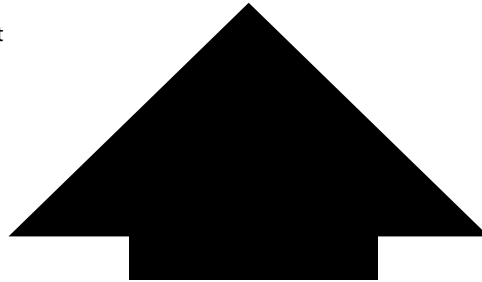
vSTEEP - A water consortium wants to buy water from Tasmania and send it through a \$2 billion pipeline from Burnie, on the northwest coast, to Victoria. One member of the consortium is understood to be a major oil and gas producer listed on the Australian Stock Exchange, while another is Melbourne water engineer and "pipe dreamer" Geoff Croker. The scheme is based on forecasts showing the only place in Australia with sufficient "spare water" to solve the shortage in mainland states is Tasmania."

Heraldsun.com.au

vSTeeP - "It is a problem that besets Tamil Nadu almost every year: thousands of acres of crops are lost due to inundation in the Cauvery delta region during the north-east monsoon. Concerned over the trend, the state public works department is preparing a plan to divert floodwaters by laying a flood carrier canal to divert the excess water upstream of the Cauvery." - Indiatimes.com

vSTeeP - "Currently, 1.1 billion people lack access to a reliable water supply, and 2.6 billion people lack access to adequate sanitation," said F. Mark Modzelewski, Co-Founder and Executive Director of the Alliance. "By 2025, over half the world's population will live in water-stressed or water-scarce countries. One quarter of global freshwater use exceeds local long-term accessible supplies."

reuters.co



If who demand would get exceeded priority supply, access?
 IF CRITICAL SUPPLY WAS NEEDED ELSEWHERE IN AUSTRALIA, COULD WE OFFER A SOLUTION?
patterns change, could new catchment areas emerge? Central Highlands adapt to service these new catchment areas?
 COULD NEW DISTRIBUTION TECHNIQUES BE NEEDED? WOULD EXTREME WEATHER EVENTS CAUSE AND ACCELERATE WATER THEFT? How would distribution be monitored under extreme scarcity? How would this impact Central Highlands water??
 What non-essential services and customers could be deferred in need? If rainfall became intense sporadic events, how would "flood" downpours be diverted to storage? What might generate the need for long distance water distribution systems?

2.0 Key themes >

& Potential implications

Societal impacts – As a prosperous nation with comparatively extensive national infrastructure, the impacts of water shortage have been restricted to certain populations and areas. Moving forward, these impacts are likely to affect more people and as the incidence of this grows, a society that has traditionally been unconstrained by resources will need to adapt to these challenges including integration of immigrants whose values towards water may be significantly different from those of the existing population. This will drive dramatic change for certain entities and areas in our society and potentially re-figure our collective psyche as many are faced with choices they do not want to make.

Increasingly it is clear that societies are being challenged to decide what activities gain access to precious water resources. For many there appears to be an awareness of the impacts that 'lifestyle' activities are having on 'life' activities for others. It is not a step too far to consider that sooner or later, personal choices will dictate entertainment, social engagement and purchasing decisions, based on their water impact

VSteeP - "Each local council rationalises their sportsgrounds. This means that one in four is selected to be watered. Water used on the sportsground needs to be reduced by 25%, in accordance with a water conservation plan, that has been submitted by each council to their water retailer. Many councils are now utilising recycled water, installing rainwater tanks and water efficient appliances." - melbournewater.com.au

vSteeP - "According to the UN, over the past three years 250,000 Syrian farmers and their families have abandoned their homes and villages, moving to cities in search of work. The UN estimates that 60 per cent of Syrian land and 1.3 million people have been affected by severe water shortages. Malnutrition in the Hasakah region, bordering Iraq, and in Deir Ezzor, on the Euphrates, has soared." - thenational.ae

vSteeP - ICONIC events such as the Pier To Pub or Falls Festival could be shut down by authorities if horrendous Black Saturday style conditions hit the region this summer. - Geelongadvertiser.com.au

"An article yesterday in the AJC shows some of the growing concern that parents are facing as they realize that pools might not be filled this summer. We've talked about this before, but this article shows that more people are starting to realize it." Atlantawatershortage.com

VStEEp - "Next week I'm going to be participating in a little bit of an ecological/social experiment and I'm hoping you'll join me. By now you've likely heard about 'No Impact Man' Colin Beavan. Along with his wife and daughter, Colin and his family embarked on a year-long project to try to minimize their impact on the environment – this included eating only local food (which meant no eating out and no coffee); only pedaling or walking to their destinations; not buying stuff, including no more clothes shopping or purchasing cleaning products from the store; no producing trash; and for about half of the year, not using electricity in their home (which was a New York City apartment)." Alternet.org

WHAT WOULD THE OUTCOMES BE IF DESALINATION PLANTS HAD EXTREMELY NEGATIVE IMPACTS ON THE MARINE ECO-SYSTEM? WHAT WOULD BE THE PUBLIC RESPONSE IF DEAD FISH LITTERED THE COASTLINE? WHAT COULD THE IMPACTS BE FOR CENTRAL HIGHLANDS WATER?

What could Central Highlands do if entities "intercepted" precipitation bound for their catchment through cloud seeding? What avenues would be open? Who would intervene?

WHAT WOULD STIMULATE THE MAJORITY OF INDIVIDUALS OR COMPANIES TO SUPPLEMENT THEIR WATER SUPPLY WITH RAIN TANKS? CHANGING ATTITUDES? FINANCIAL BENEFITS? HOW WOULD THAT CHANGE CENTRAL HIGHLANDS OPERATING CONDITIONS?

How could sensors, and smart systems be used in Central Highlands infrastructure? Could they be integrated into the way the customer operates?

Where are solutions going to be most effective? In a centralised system or with the end user?

Are the solutions and techniques employed now the most appropriate for future operating conditions or are they designed for a system that no longer exists? If there are better solutions and technologies for certain climatic conditions, what solutions may be the best for CHW customers? Who will the public and organisations go to when looking for advice and products that are suited for their particular needs?

COULD THE PRODUCTS BE PRICED OUT OF THE REACH OF THE PUBLIC?

If everyone still made small lifestyle changes, would water still be an issue in the future? What are potential water related events that may elevate water to the number one social issue or topic? If the media expozayed a family who were chronically de-hydrated or water stressed in Australia because of price or scarcity, what would the fall out be?

WHAT COULD FORCE PEOPLE TO CHANGE THE WAY PEOPLE USE WATER? PRICE? SCARCITY? RESPONSIBILITY? EDUCATION? HOW WOULD PEOPLE RESPOND IF A LACK OF WATER STOPPED THEM FROM ENJOYING RECREATIONAL ACTIVITIES? WHAT REPERCUSSIONS WOULD THIS HAVE IN POLITICAL ARENAS? BUSINESS? MEDIA?

How deal with would increasing Central public highlands scrutiny? WHAT MESSAGES OR INFORMATION WOULD CENTRAL HIGHLANDS WATER DELIVER IF THEY HAD THE PUBLICS ATTENTION?

Could certain lifestyles cease to be an option because of water shortage or changed climatic conditions?

IF WATER BECAME THE BIGGEST SOCIETAL ISSUE OR TOPIC, WOULD THIS EASE OR INTENSIFY REQUIREMENTS FROM BODIES LIKE CENTRAL HIGHLANDS? HOW COULD WATER STRESS CHANGE THE HEALTH AND HAPPINESS OF POPULATIONS IN AREAS OF WATER SCARCITY?

How might organisations help populations cope with water stress?

Emerging solutions – There are many entities who are discussing possible solutions and in many cases stopgaps to address water issues. Most of these plans approach the current water systems and practices employed around the world while others are trying to completely re-think water in it's entirety. Different approaches to water management from collection and storage through to technologies that encourage precipitation and favorable climatic conditions are being developed. What appears to be missing is a holistic co-ordination and understanding of how a combination of various approaches coming from different quarters may combine and the impacts of these new systems.

vStEEP - "Even with high prices for energy today, PGE has decided the Bull Run Hydroelectric Protect that went on line in 1913 is no longer economical, can be replaced more cheaply by wind generation, and causes too much harm to salmon for the power it produces. The utility is spending \$17 million to remove Marmot and Little Sandy dams and Roslyn Lake between" -uswaternews.com

vsTEep - "Around the world, dozens of wave-energy systems are under development. Some are fastened to vast cliffs at the water's edge and harness the power of enormous waves pounding against the land. Like many other clean-energy technologies, these designs are slowly moving from prototype to commercial stages. None, so far, have proved themselves to be cost-effective on a large scale. But there are plenty of companies vying to be the first."

Popsci.com

vsTEEp - "Bill Brennan, who oversees Aqua Terra Asset Management's two water funds, said he expects desalination plants to grow from 12,000 currently to 60,000 in the next 10 years -- much of that in the Middle East, China and coastal United States"

Greentechmedia.com

vsTeEp - "So the proposal is to inject a fine spray of sea salt from the ocean surface into the clouds to artificially increase the number of drops, reduce their size and increase the reflectance

of the clouds, making them whiter. This one-off increase in reflectance - and the resulting cooling - could buy us precious time, maybe as much as 25 years."

Bbc.co.uk

vsTEEp - "To capture the water from fog, rectangular obstacles constructed of polypropylene mesh are employed. These are usually placed perpendicular to the prevailing flow of the clouds.

oas.org

vsTEEp - "Behrokh Khoshnevis, a professor in the USC Viterbi School of Engineering, says the system is a scale-up of the rapid prototyping machines now widely used in industry to "print out" three-dimensional objects designed with CAD/CAM software, usually by building up successive layers of plastic. "

sphysorg.com

2.0 Key themes >

& Potential implications

Changing Climatic conditions – There is no doubt that climate change is occurring with many experts believing this change will accelerate in the future. What are unclear are many of the implications that this will have for people, organisations, regions and resources such as water. Some views seen in this research believe this change is catastrophic while others plead the case of “adaptation” to new climate systems and events. Increasingly extreme weather events is a factor that different factions see as a realistic contention moving forward while others see an understanding of “new” regional weather patterns as a key to redistributing efforts and resources.

vStEp - “The apparent shift to a drier climatic regime than previously experienced may be here for some time – perhaps for the long term. One way planning for and of coping with such an adverse climate shift is to reconfigure the river – make it smaller, manage it differently and get more flow.” - Myoung.net.au

vStEp - “While residents in Queensland yesterday defended their homes from a bushfire that raged north of Brisbane, people in the southern Flinders Ranges, the Mid North and Mt Lofty Ranges are being urged to prepare for possible flooding with rainfall of up to 60mm.”

News.com.au

vStEp - “Scientists are now seeing signals that the Sahara desert and surrounding regions are greening due to increasing rainfall. If sustained, these rains could revitalize drought-ravaged regions, reclaiming them for farming communities. This desert-shrinking trend is supported by climate models, which predict a return to conditions that turned the Sahara into a lush savanna some 12,000 years ago.”

Nationalgeographic.com

vStEp - “Nine boundaries were identified including climate change, stratospheric ozone, land use change, freshwater use, biological diversity,

ocean acidification, nitrogen and phosphorus inputs to the biosphere and oceans, aerosol loading and chemical pollution.

The study suggests that three of these boundaries (climate change, biological diversity and nitrogen input to the biosphere) may already have been transgressed. In addition, it emphasizes that the boundaries are strongly connected — crossing one boundary may seriously threaten the ability to stay within safe levels of the others.”

stockholmresilience.org

vStEp - “To confuse the issue even further, last month Mojib Latif, a member of the IPCC (Intergovernmental Panel on Climate Change) says that we may indeed be in a period of cooling worldwide temperatures that could last another 10-20 years.” - bbc.co.uk

IF REQUIRED, HOW MANY CUSTOMERS COULD GIVE AN ACCURATE WATER FOOTPRINT FROM “CRADLE TO GRAVE” BY PRODUCT? COULD PEOPLE AND BUSINESSES BECOME DISCERNING ABOUT THE WAY WATER IS COLLECTED/SOURCED OR THE MATERIALS USED? IF CONSUMERS BOYCOTTED WATER INTENSIVE PRODUCTS, COULD CENTRAL HIGHLANDS CUSTOMERS SUFFER OR EVEN FOLD? **Could Central highlands be able to provide expertise to reduce water usage?** What could companies do to be seen as exemplary water users? **What could extreme environmental activists take issue with concerning customers, practices or policies of Central highlands water?** Will people be more receptive to water restrictions or rationing if they are more community minded? **HOW WILL PEOPLE AND COMPANIES WHO ARE CAUGHT BEING WASTEFUL BE VIEWED?**

If country's choose to specialise in certain industries because of climate and resources, what would happen if Australia "lost" industries like manufacturing, textiles, engineering?

HOW WOULD WATER USAGE CHANGE IF AUSTRALIA BECAME A COMPLETELY "RESOURCE SUPPLY" ECONOMY??

If precipitation patterns change, how would Central highlands infrastructure cope?

WHAT TYPES OF SOLUTIONS MAY BE BEST IN UNCERTAIN WEATHER PATTERNS? IF EXTREME WEATHER EVENTS INCREASED, WOULD THIS IMPACT COLLECTION OR STORAGE CAPABILITY?

What would CHW do if the changing weather patterns actually delivered MORE precipitation and water capability?

How would CHW deal with massive differences in catchment volumes?

Changing water attitudes – Emergent ideas and behaviour, both in broader society and more specifically toward water are evident through the research process. Future approaches to the way we view products and consumption through to what is seen as socially acceptable will influence the ways our society operates and interact with water. Underlying the shift in attitude and behaviour is an emergence in the understanding of the water situation by a growing number of people. This is making people re-consider their interaction with water not just directly but indirectly.

VSteeP - "the material girl recently placed an order for 110 pounds of kosher beef for the last two performances of her "Sticky and Sweet" tour in Tel Aviv. WHOA!

– it takes 2,464 gallons of water to produce one pound of beef.

That means Madonna's one order is using 271,040 gallons of water!!!! For this stunt Ecorazzi gives Madonna 2 HUGE green thumbs down. Save some water for the rest of us, why don't you?" - ecorazzi.com

vstEEp - "Food and drink products should carry a new label to give consumers more information about their "water footprint" – the hidden amount of water used in the manufacturing process – two health and food lobby groups will recommend this week. More transparency is needed about the huge volumes of water used to produce food, which most consumers are unaware of, said the joint report by the Food Ethics Council (FEC) and the health and food group Sustain." guardian.co.uk

VsteEp - "Suspend water restrictions to wash cars? What a bunch of Sydney sooks. Now that you have our topsoil, what are farmers going to use to grow your food? This may have brought home to Sydney people that west of the mountains have been in drought for more than a decade. Now that your lawns have been top-dressed free, you might spare a thought for non-metropolitan Australia."

Bill White - Griffith (smh.com.au)

VstEEp - "But it's not all macroeconomic- geo-political-power play. Recession or not, consumers will continue to demand responsible behavior from brands. Just one statistic: "Four out of five people say they are still buying green products and services today—which sometimes cost more—even in the midst of a US recession." (Source: Reuters). Rest assured that the quest for an ECO-BOUNTY will continue at full force" - trendwatching.com

VSteeP - "...the aspirational desire of developing nations to improve their lifestyle, is held against developed nations' desire to maintain their lifestyles. For nations in crisis the desire is far more stark (survival) and the clash of values between poor nations and rich ones can be stated as 'life versus lifestyle'."

Gonc; Skirke; Kleizen & Barber - Journal of Cleaner Production 15 (2007), Elsevier

2.0 Key themes > & Potential implications

Methods of operation – A debate that appears to be carrying increased momentum involves the provision of solutions for things such as utilities and food at a state or collective level as opposed to more localized or even individual responsibility. The strain on large-scale water networks and infrastructures can potentially be supplemented with more nimble and localized approaches. Both approaches have implications and considerable timeframes to contend with if facilitated properly.

vSteep – “The government, in the new master plan, which is being prepared for Gandhinagar, has decided that it will be mandatory for each construction to have provisions for rainwater harvesting (RWH). The decision comes since there is no regular source of water for Gandhinagar and the city depends heavily on bore wells and Narmada water.”

Indiatimes.com

vSteEp – “Arguably, administrative arrangements that seek to increase the productivity and efficiency of water use at the national level are best decided at that level. Examples, such as those in the National Water Initiative signed by the Australian and State/territory governments, include commitments to water sharing rules that ensure maintenance of river and aquifer health; definition of entitlements to provide certainty to investors; and use of water trading to facilitate adjustment; and full cost pricing to ensure efficient investment and use of infrastructure.”

Myoung.net.au

vsteEP – As part of the \$12.9 billion Water for the Future plan, the Government is delivering the \$250 million National Rainwater and Greywater Initiative to help people use water wisely in their everyday lives.

The Australian Government is providing:

- Rebates of up to \$500 for households to install rainwater tanks or greywater systems.

- Grants to surf life saving clubs of up to \$10,000 to install a rainwater tank or undertake a larger water saving project.

environment.gov.au

vSTEEP – Professor Stuart White of the UTS Institute for Sustainable Futures cited the example of the premature construction of the Sydney desalination plant as a clear example of the wrong path at the wrong time.

“The future of water, sewerage and drainage infrastructure is a move away from large centralised systems, towards a mix of smaller, distributed, systems located in neighbourhoods and in the basements of buildings,” Professor White said.

uts.edu.au

At what point would companies believe their own water? **Could companies or even whole industries re-locate to areas where water prices make success more likely?** HOW WOULD CENTRAL HIGHLANDS MITIGATE THE RISK OF LOSING THEIR TOP 5 CUSTOMERS TO ANOTHER REGION? WHAT IMPACTS WOULD IT HAVE? *Could we ever see households selling spare water or even credits back to water grids as a reward for easing the pressure on strained systems and infrastructure?* IF ALL HOUSEHOLDS COLLECTED MOST OF THEIR OWN WATER, WOULD THAT CREATE AN OVER SUPPLY FROM EXISTING WATER PROVIDERS? Could production runs and manufacturing become “seasonal” due to high prices of water during certain times of the year? WHAT MIGHT HAPPEN IF ORGANISATIONS WHO ARE NOT CURRENTLY AFFECTED BY WATER SHORTAGES STARTED SEEKING INSURANCE COVERAGE?

Could businesses and consumers be expected to harvest much of their own water needs?

WOULD PEOPLE CHOOSE TO COLLECT THEIR OWN WATER IF PRICES SKYROCKETED?

Would this ease the pressure on water management groups? WHY OR WHY NOT? COULD WE SEE CHANGES TO WATER MANAGEMENT GROUPS? What would a new operational structure look like & why? How would this impact Central Highlands water??

Who might benefit from a de-centralised model? Is there a hybrid model that may be appropriate? How long would different models of operation take to imbed and what could delay them? What could stimulate a change in the way our water management is structured? Could crowdsourcing be the best option to gain the most relevant, cost effective manner of research, strategy, and human capital?

Economic commodity – A consistent theme seen in this appraisal is the growing economic value of water and the leaps that it may still take. Much of this stems from the historical abundance of water and a growing realization that it is a finite resource. People and organisations are increasingly thinking of water in the same way they think of other commodities they consume, it comes with a price and the more scarce it is the higher the cost.

VsTEeP - "With cities growing and agriculture expanding throughout South America, experts predict that climate change will exacerbate water scarcity, increasing conflicts between competing users, pitting city dwellers against rural residents, people in dry lands against those in areas with abundant rainfall,"
scientificamerican.com

vStEeP - "In reality, the number of times you go to the toilet is not likely to be influenced by your sewage bill but it may influence how often you flush.

It is likely, however, that volumetric

sewage charging would encourage people to install dual-flush toilets, refrain from installing garbage disposal units in kitchen sinks, use front-loading washing machines, etc."
myoung.net.au

vsTEep - "IBM is developing a portfolio of IT-related water management technologies; a business that it estimates can total \$20 billion within five years. At a water conference next week, IBM and Intel will be forming a working group to study how information and technology can be used to improve water management, according to IBM."
cnet.com

vStEep - "We think water is going to be a very severe determinant of prosperity and well-being." Inadequate rainfall has led to a drought in as many as 278 of India's 626 districts, according to the farm ministry. This has sparked concern over food shortages and rising prices, prompting authorities to raid wholesalers hoarding commodities. Raw sugar futures have soared 90 percent this year.

"Unless we drive in the fear of god among hoarders, the man on the street will suffer from rising prices," Authorities seized 480 metric tons of sugar in the past week, he said.
Bloomberg.com

vStEEP - "But it is these same market forces that could well drive crucial changes in water use. In theory, when water becomes expensive, it will be used more efficiently."
hbswk.hbs.edu (Gary Emmons)

vsTEEP - "Australia's future is tied up in big, world-class projects where the likes of the huge Gorgon LNG development will be a guideline (but possibly the largest). These projects are going to change Australia; add to our problems controlling climate change and carbon footprints, and turn us into the only energy major in the world's 30 biggest economies, located next to the world's two most important emerging markets in China and India, with energy short Korea and Japan to add extra demand."
ibtimes.com.au

2.0 Key themes > & Potential implications

Security – Without water our society will grind to a halt. Businesses cannot operate, food cannot be produced, waste cannot be treated and people will die. It is growing concerns about its long-term provision that has made entities aware of how much water is involved in so many essential functions that form the basis of stable societies. So how do we insure its supply and security? This answer becomes more troublesome as we consider the growing complexities such as climate change, urban sprawl, geopolitical factions and regional disparities.

In addition, do we risk potable water supplies by attempting to fix seemingly unrelated problems like CO2 emissions through proposed technologies such as sub terrane carbon sequestration?

vsTeep - "The publication reviews research and data on geologic sequestration and presents an alternative the agency is considering related to the proposed injection

depth requirements for carbon dioxide. In addition, the publication announces that EPA is evaluating the need for a more comprehensive regulatory framework to manage the geologic sequestration of CO2."

EPA.gov

VSteeP - "In his 2002 State of the Union Address, President Bush noted that confiscated Al Qaeda documents included detailed maps of several US municipal drinking water systems."

Waterhealthconnection.org

VSteeP - "The Government of Canada's strategy to prohibit the bulk removal of water from major Canadian water basins, including for the purpose of export, is both environmentally sound and consistent with Canada's international trade obligations. It builds on sound water management principles and the need to protect the integrity of Canada's watersheds.

Water is a shared responsibility between the federal, provincial, and

territorial governments, and each have an important role to play in protecting Canada's freshwater resources."

ec.gc.ca

vsteEp - "A significant volcano eruption in Australia is 'well overdue' and emergency authorities must better prepare themselves and the wider community to respond to it, the recipient of the prestigious Geological Society of Australia (Victoria Division) Selwyn Medal for 2009 has warned.

"There are around 400 volcanoes stretching from the Western District of Victoria into the Western Uplands around Ballarat and to the north of Melbourne around Kyneton and Kilmore, in some parts of the Eastern Uplands such as to the north of Benambra, and across to the South Australian border near Mt Gambier. A volcanic eruption in the Western Uplands could potentially see lava flows and ash falls impacting on Melbourne."

Popsci.com

If unprecedented amounts of food needs to be produced, could there be opportunities for increased export capability? Could scarcity/price translate into "no water" solutions to what was once water intensive processes and industries?

How would Central Highlands be impacted if their biggest customers cut use through new technologies or solutions?

WHAT TYPES OF WATER USAGE WOULD BE SEEN AS NON-ESSENTIAL BY SOCIETY? BY GOVERNMENT? BY BUSINESSES?

Could securing water supply become so important that companies concentrate on collecting or sourcing it themselves and not buy it? How would that change the way water bodies operate?

WHAT IS THE POPULATION SIZE AND WATER VOLUME THAT CENTRAL HIGHLANDS WOULD NOT BE ABLE TO SERVICE?

Could Central Highlands cope with a population explosion?

Could a higher level of governance step in and take control of Central Highlands assets in an emergency?

What types of groups might want to damage Central Highlands assets?

IF OTHER REGIONAL WATER SUPPLIERS WERE JEOPARDISED, HOW COULD CENTRAL HIGHLANDS RESPOND?

If a group were looking to interfere with Central Highlands water supply, how might they go about it?

What type of disaster would have the biggest long-term effects on Central Highlands operations?

Could the spread of extreme environmental attitudes become a threat to customers who use water intensive practices?

HOW MAY LAND USE AND WASTE MANAGEMENT BE SEEN IN A SOCIETY THAT IS KEENLY SENSITIVE TO ENVIRONMENTAL IMPACTS?

What other organisations or entities may need to be engaged in the future if water resources become increasingly scarce?

Military? Police? Fire Authority?

WHAT TIMES OF COMMUNICATION WILL BE BEST TO COMMUNICATE AN EMERGENCY?

PHONES? INTERNET? DIGITAL BROADCASTS? OTHER MEDIUMS?

Increasing water requirements –

Factors such as population growth, increasing consumption and lifestyle expectations all add weight to increased future water demands.

As a key component of so many developments moving forward, the need for more water can be seen in almost every sphere of society including food, energy, construction and manufacturing, transport, sanitation etc. Growing needs are at the base of all water-oriented discussions and so more clarity needs to be gained on: Where: Who: And Why; Will people be seeking more water?

VSTeep - "ONE of mankind's greatest challenges over the next 50 years is how to feed everyone, as a study warns we'll eat more food in the next five decades than in all of human history. In an explosive summary, CSIRO boss Megan Clark said that challenge, which went hand-in-hand with climate change, demanded a critical application of science, and Australian research in particular. Her comments come as an international study warned of the

dangers global agriculture faces over the next 40 years, including soaring prices for staples such as wheat and rice. By 2050, crop yields will have fallen, resulting in higher prices for basic food items, such as a loaf of bread costing up to three times as much" - Theaustralian.com

vSteEp - "The combined increase for non-metropolitan areas was greater than population growth in capital cities. There would be further pressure as at least a million baby-boomers planned their moves from next year through until 2016, Mr. Stokes said. The rate of migration and population growth to coastal areas would be the equivalent to adding 11 more Gold Coasts to the population of these communities, he said."

Brisbanetimes.com.au

VSTEEP - "Ethanol consumes more water over time as corn production extends to regions that need extensive irrigation," says Sangwon Suh, an assistant professor of biosystems engineering at the University of Minnesota and coauthor of the study. "That means

more water is needed to produce a given unit of ethanol over time."

Technologyreview.com

vstEep - "Overfishing has contributed to stock declines so severe that about 15 per cent of all exploited capture fisheries have "collapsed" or are at less than 10 per cent of their unexploited levels. Inside.org.au

VStEEP - In an interview with People's Daily Online, Professor Liu said from the food consumption perspective, China's average water footprint in 1961 was about 260 cubic meters of water, but in 2003, the average water footprint increased to 860 cubic meters of water. This change is huge and it shows that the change of people's eating habit, for example eating more beef or lamb affects the water footprint. He also looked at it in specific items such as grain and meat. The footprint of grain consumption didn't change much over the past 40 years, but the consumption of meat showed drastic increase."

English.people.com.cn

3.0 Key drivers of change.



Population growth - The continuing growth of Australia's population is expected to continue for at least another forty years. The growth will change the requirements and capabilities seen in all areas of Australian life.

"Treasurer, Wayne Swan, has just announced that Australia's rate of population growth will be approaching double that, or 65 per cent, to 35 million by 2049."

smh.com.au

With population growth not only in Australia but in the Asia Pacific region, how will increasing numbers of people impact the requirements for water in a global economy and society? Are there risks and opportunities for entities that will need to face these challenges? Could population pressures external to Australia be a factor?

Increasing immigration - Initial and conservative estimates over the next 5 years suggest the change will be immense and have ongoing effects. Long-term impacts in culture and population will influence the way Australians work, socialise and live. There will also be challenges and opportunities presented by "new" Australians.

"Professor McDonald says that migration over the next 20 years would need to go up by about 50,000 per year, from about 170,000 to 220,000 each year. "Later on, after 20 years, it would be going up again to up around 300,000," he said."

"A paper prepared for the Academy of Social Sciences Experts say the country needs to boost immigration by 30 per cent within the next 20 years to meet its growing work force demand. Many job vacancies will be created when millions of baby boomers retire. They will also create the need for more workers to care and cater for them as they age. Australia has always relied on immigration to fill jobs and keep its economy growing, but there are now signs the level of immigration will have to ramped up to stop a skills shortage getting worse."

Simon Lauder, ABC News

As Australia seeks to embrace multi-culturalism, are there factors that need to be reconsidered when approaching water challenges? Will C4W need to have different language options in their communication? Will new immigrants have different attitudes to water? Could immigrants bear the brunt of negative attitudes if there are shortages? How would C4W respond?

Changing social attitudes - New attitudes and values are emerging in Australia. There is growth in more socially centric, responsible sets of ideals. It is starting to be reflected in a variety of areas through actions and results. It is seen in shopping baskets in environmentally friendly products; in the workforce through employees asking for more flexibility; in new government policies that seek inclusive and sustainable growth. As these values permeate throughout Australia they will shape the actions and reactions in everyday life in different ways.

"(The) review shows young Australians are anything but apathetic," Institute director Eric Sidoti said in a statement. "They are strongly engaged with political issues and social causes such as the environment, poverty, health and an Australian republic...however, they feel alienated and marginalised by old, formal, institutionalised politics."

The review found that young people are not worried about maintaining political party loyalty, but are most concerned with political choice. "Young Australians are distrustful of politicians and they are not content to accept the hierarchies in traditional institutions of democracy," Mr. Sidoti said. "They prefer to engage in grassroots campaigns and cause-based activities, where they feel like they can make a difference."

theage.com



As new attitudes and values continue to emerge, how will they translate to behavior toward water? Could we see more responsible and less wasteful practices? Could consumers demand more visibility and guardianship from organisations? Should C4W be leading these changes or looking for engagement?



Urbanisation - Increasing numbers and proportion of the Australian population will live in urban environments and this will greatly impact the way they interact with society.

"Australia is an urbanised country and the level of urbanisation is increasing.

The growth of our cities has many economic, political, social and ecological ramifications for the surrounding countryside. The ecological ramifications - the landcover change as the urban areas subsume their surrounds - was our focus. The irreversible conversion of agricultural to urban landcover is still occurring. Nonetheless, as all city and rural dwellers alike will come to realise, it is the economic, political and social ramifications of the continuing growth of cities that are the most critical issues to confront."

eoc.csiro.au

Does the steady urbanisation of Australia represent both opportunities and risks for water provision moving forward? Will increasing urban populations add pressure to regional water sources? Could efficient infrastructure help ease the pressure on water supplies? How will water provision be prioritised? Could our cities be at risk of forming "out of sight, out of mind" attitudes when it comes to water?

Aging - Although there are varying forecasts on the numbers and proportions of Australians aged 60 and over in the future, all agree that there will be a significant shift in demographic profile toward the aged. The impacts will be seen in all spheres of Australian society from new products and government policies to changing family arrangements and new industries.

The U.N population database forecasts the proportion of Australians aged 60 years and older will move from 17.8% in 2005 to 25.8% in 2025.



What are the implications for a population that may soon have one in every four over the age of sixty? Might we see new retirement "regions" appear? Could traditional views of "endless water" supplies be a barrier that CHW will have to contend? What will the water requirements be of a health system that may struggle with additional pressure?

Increasing governance and regulation - The growing reality and approaching issues are prompting the government to take a pro-active and forward focused approaches to policy, legislation and regulation. There is unprecedented activity around initiatives that aim to tackle future problems and one of the first acts of the present government was to instigate the Australia 2020 summit. A leap in the understanding of cause and effect relationships have highlighted where issues and opportunities stem, giving visibility to the various systems operating within Australia. Government activities around the nation at both a local and national level suggest recognition that only a more active form of government leadership will provide the framework and system required to sustain a prosperous Australia.

"...the Government is now preparing to expand staff numbers to meet a growing workload, according to a report in Fairfax papers today..."It appears that the Federal Government is starting to recognise that more staff are needed to get its massive job done,"

- news.com

Could unprecedented challenges make way for unprecedented responses? If water becomes an increasingly important political agenda, will we see changes in the way water is governed? What would legislation look like if designed to achieve current objectives? What might facilitate a change in the way water is currently regulated? Would there be much warning?

4.0 Elements of

>interest



Technological advances in everything from product design software to digital video cameras are breaking down the cost barriers that once separated amateurs from professionals. Hobbyists, part-timers, and dabblers suddenly have a market for their efforts, as smart companies in industries as disparate as pharmaceuticals and television discover ways to tap the latent talent of the crowd. The labor isn't always free, but it costs a lot less than paying traditional employees. It's not outsourcing; it's crowdsourcing w i r e d . c o m

Could Central Highlands leverage this model to gain a breadth of skills and inputs into its operations?

Would this approach enable flexibility in uncertain times? Is it something that may enable fresh thinking and new perspectives?

Are there questions or issues that Central Highlands currently has that this may be relevant?

"Working at a central lab facility in the San Francisco Bay Area, researchers will create new forms of life that will produce ethanol with unprecedented efficiency. This field of science -- synthetic biology -- will be used to make crops that are extremely tough and productive. Optimized plants will push the limit of fuel production per acre of land. The same laboratory techniques will be used to design organisms that convert plant material into fuel in the most cost-effective manner possible."

"Earlier this year, the energy giant BP gave \$500 million to Berkeley, Lawrence Berkeley lab, and the University of Illinois at Urbana-Champaign for similar alternative energy research." - wired.com

As developments into crop engineering, land use and soil cultivation progress, how will C/H/W keep abreast of all the implications associated? Does C/H/W have the relationships and capability to partner various factions to deliver changing water related requirements?

"We should take care of the foreigners here, and give them running water and help them survive and live the proper way," she says firmly, like a schoolmarm. "But we should do this only after they understand we are the rulers of this country. Until they deserve it, they can't have the best conditions." - thenational.ae

Could we see a situation where long-term customers or users of water feel angry about new users restricting supply and therefore access to historical levels or price for water? How would C/H/W deal with this situation? Could this be a potentially volatile situation? What could C/H/W do to prepare for and abate this situation?

If water footprint becomes a necessary disclosure on products, could it make certain consumables unviable? Could the government raise taxes on products and services that are water intensive? Which industries would be the biggest loser in this scenario? Would this change the role of water bodies in Australia?



1000 litres of water	1 kg rice
1350 litres of water	1 kg wheat
16000 litres of water	1 kg beef
140 litres of water	1 cup of coffee
1000 litres of water	1 litre of milk

waterfootprint.org

"Sony, one of the world's largest battery makers, said it had succeeded in creating a battery that produces electricity by breaking down sugar. The bio cell, which measures 39 millimeters cubed, delivers 50mW (milliWatts) -- a world record for such a cell, according to the company." - pcworld.com

If certain crops like sugar became particularly important because of energy generation over the next 10-15 years, how would C4W seek to engage parties in these ventures? How could new land use impact the way C4W has to operate? Customer relationships? Product requirements?

"The UK's transport infrastructure will be radically changed over the next 50 years by RFID tracking tags, embedded sensors and an artificial intelligence network that will reduce congestion and pollution, according to scientists from the government's Foresight think tank."

"RFID tags, sensors, GPS technology, 4G networks, wi-fi and artificial intelligence will be embedded into vehicles and the transport network to create an "intelligent infrastructure", according to the report. This would inevitably be central to the government's already announced road-user charging strategy." - Silicon.com

How could "smart systems be utilised in the collection, storage and distribution of water by C4W? Could sensors and computer programs be the best way to maximise efficiencies?

What objectives would they be set if budget and resource was no issue?

"Charters calls for major water reforms to increase food supply in Asia." "The steps needed are: one, recognition of the problem by the powers-that-be like the politicians; two, reform of the institutions that manage water and the way water is governed particularly making sure that people's rights to water are recognised in law and legislation, making sure that those rights protect the water for the farmers. On farms and in irrigation systems technical reforms are needed which will increase productivity -- meaning that farmers will benefit, not only by growing more, they'll also get more profit." - dw-world.de

What types of water reforms could we expect from state or federal government over the next 15 years? How would this impact the way C4W customers might operate? Could this change the way that C4W may have to approach activities? What would happen if a complete restructure of water management was called for?

4.0 Elements of

>interest

"Even if you don't live somewhere under threat at the moment, there is something for everyone to do. We can work to create a trust for drinking water and wastewater; to drop conditions in federal funding that favor privatizing water resources; to block water corporations from obtaining access to public funding through tax-exempt private activity bonds; and to promote strong public management of water resources. Or you can work to support organizations like Corporate Accountability International, Food and Water Watch, Sierra Club and others who are organizing around the issue. "There has to be preemption -- companies come in secretly and people don't know there are negotiations going on, and communities that are organizing are coming from behind," said Snito" - altnet.org

Could water become privatised in Australia? What events or outcomes would make this change realistic? What would the signals be that would be seen such an outcome? Who would be involved in a decision like this? What would this mean for an entity like C4W?



As nations and other entities experiment with practices such as "cloud seeding" and "cloud whitening", how might C4W respond if these practices had an adverse effect on the water patterns in its region? How would C4W contend with a 20% reduction in regional precipitation and how would it know what had caused it? Is there a need to monitor these experiments?

Saudi Arabia, the world's richest oil nation but poorest in water, appears to be pushing ahead with plans to force clouds to rain to maximise its water resources. Prince Turki bin Nasser, Chairman of Saudi Meteorology and Environment Protection Authority, said King Abdullah bin Abdul Aziz had approved the plan, which could be the first artificial rain experiment in the Middle East. "Besides traditional techniques to obtain water, including sea water desalination and recycling, the Kingdom has been searching for other techniques. There is a strong interest by the leadership to embark on this experiment and evaluate its effects in finding a new element to boost reserves." Speaking at an infrastructure conference in Abu Dhabi last month, a Saudi official said the Kingdom is planning to nearly \$40 billion (Dh146bn) over the next 20 years to develop its water distribution network. - business24-7.ae

Aquifers are underground layers of rocks or sediments from which water can be extracted – normally by drilling boreholes or digging wells. They hold 100 times the volume of freshwater that flows down rivers and streams around the world at any time. What the UNESCO map reveals is just how many aquifers cross international borders. So far, the organisation has identified 273 trans-boundary aquifers: 68 in the Americas, 38 in Africa, 155 in Eastern and Western Europe and 12 in Asia. Each trans-boundary aquifer holds the potential for international conflict – if two countries share an aquifer, pumping in one country will affect its neighbour's water supply. This [map] is a fantastic resource which a lot of us have been waiting for it for," says Mark Zeitoun, a water policy expert at the London School of Economics. "It highlights the importance of groundwater resources, which is generally misunderstood or ignored completely compared to surface water." - newscientist.com

What would happen if a large source of fresh water was found in the region? Would C4W be involved in its management? What would happen if a private entity lay claim to it? What if the source had several access points in other regions? Who would be involved in discussions?

What stakeholders would need to be involved? Are there any precedents?



"If climate change and population growth progress at their current pace, in roughly 50 years farming as we know it will no longer exist. This means that the majority of people could soon be without enough food or water. But there is a solution that is surprisingly within reach: Move most farming into cities, and grow crops in tall, specially constructed buildings. It's called vertical farming." - DICKSON D. DESPOMMIER
NYTimes.com

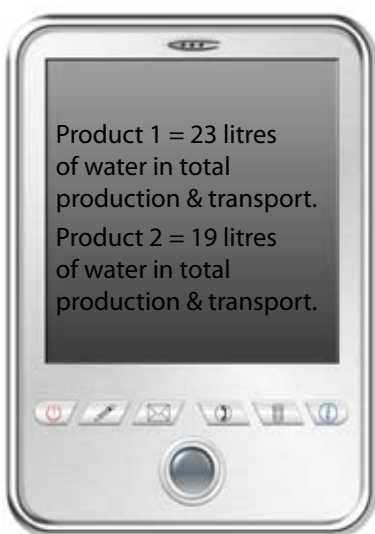
If elements of vertical farming and home farming were adopted over the coming decades, how would it impact distribution? Transport? Resource requirements? Rural populations? Industrial zoning? etc

What repercussions might this have for Central Highlands water if 35% of all food came from the city?

"EoPlex uses this remarkable fluid to "print" 3-D metal or ceramic shapes in much the same way that a printer makes a book -- by printing one sheet at a time, and laying each new sheet over its predecessor. There is, however, a key difference between a book and the sorts of objects that EoPlex prints. A book is solid. But thanks to its magical ink, EoPlex can print shapes that have interior voids -- such as a metal box."

Tom Abate - sfgate.com

Could advances in rapid proto-typing, fabrication and manufacturing change the water needs of Central Highlands' customers? Could this technology alter the way products are stored and delivered forever?



"ECO CONTROLLER"

ECO CONTROLLER PUTS THE CONSUMER IN CONTROL. PROVIDING ALL THE INFORMATION NEEDED TO MAKE A PROPERLY INFORMED PURCHASING DECISION

Eco controller provides an instant eco-value for the product you are considering. This value is based on cultivation methods, transportation factors, amount and type of package, whether the supplier is offered a fair deal and the overall eco friendliness of the product and its supply chain. Just scan the barcode or info-tag"

Taken from "Ericsson - Life in 2020" a website dedicated to the telecommunication giants' thinking on where society and therefore technology will shift in the coming decade and beyond.

Could Central Highlands be increasingly required to measure and monitor the water usage of their customers as an industry standard? Could it be part of a new reporting requirement? What changes would have to be implemented?

4.0 Elements of >interest



"Our group has shown that antimicrobial ingredients used a half a century ago, by our parents and grandparents, are still present today at parts-per-million concentrations in estuarine sediments underlying the brackish waters into which New York City and Baltimore discharge their treated domestic wastewater," said Halden, a new member of the institute's Center for Environmental Biotechnology. "This extreme environmental persistence by itself is a concern, and it is only amplified by recent studies that show both triclosan and triclocarban to function as endocrine disruptors in mammalian cell cultures and in animal models."

- sciencedaily.com

How could current or historical practices impact the quality and safety of water collected? Could chemicals or pollution present in the ground be a cause for concern in the future? How would this be known? how would C4W react in the scenario where historical practices have lead to social or personal harm?

Edible, lab-grown ground chuck that smells and tastes just like the real thing might take a place next to Quorn at supermarkets in just a few years, thanks to some determined meat researchers. Scientists routinely grow small quantities of muscle cells in petri dishes for experiments, but now for the first time a concentrated effort is under way to mass-produce meat in this manner.

Henk Haagsman, a professor of meat sciences at Utrecht University, and his Dutch colleagues are working on growing artificial pork meat out of pig stem cells. They hope to grow a form of minced meat suitable for burgers, sausages and pizza toppings within the next few years. - commondreams.org

There are many different approaches to what is being touted as an approaching food crisis. What would happen if meat was raised in petri dishes instead of from livestock? Alternatively, what if vegetarianism increased in Australia by 30% because of environmental concerns and growing prices? Could consumption patterns change so drastically that it meant a complete re-think about what industries may be present in C4W's region? HOW flexible does C4W need to be to adapt to changes in customers?

"SOAK uses sensors around a farm that measure soil moisture, rainfall, wind, dam depth, temperature and water flow. It adds external data such as weather forecasts and combines it with crop lifecycle information to create a sophisticated watering system. The toolkit controls farm sprinklers and prioritises water use where and when it's needed. Farmers can be notified when a field reaches critical moisture level via SMS, and also when there is a critical irrigation failure such as a burst water main."

swinburne.edu.au

Mechanized picking wouldn't be new for some California crops such as canning tomatoes, low-grade wine grapes and nuts....The new pickers rely on advances in computing power and hydraulics that can make robotic limbs and digits operate with near-human sensitivity. Modern imaging technology also enables the machines to recognize and sort fruits and vegetables of varying qualities. The technology is maturing just at the right time to allow us to do this kind of work economically," said Derek Morikawa, whose San Diego-based Vision Robotics has been working with the California Citrus Research Board and Washington State Apple Commission to develop a fruit picker. - plime.com

With many different industries and sectors moving toward automation, electronics and robotics for competitive advantage, could C4W need to look at changing requirements from customers? If customer infrastructure is changing, what changes are needed to deliver or process water from C4W's end? Does C4W have the technical ability to understand these requirements presently?

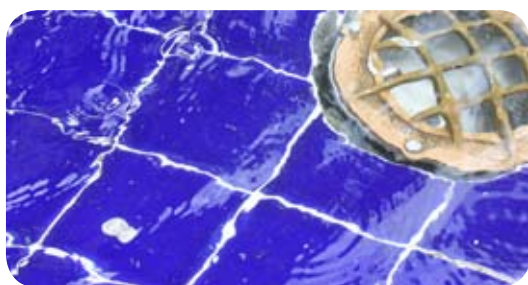


"Efficiency programs such as Six Sigma are designed to identify problems in work processes—and then use rigorous measurement to reduce variation and eliminate defects. When these types of initiatives become ingrained in a company's culture, as they did at 3M, creativity can easily get squelched. After all, a breakthrough innovation is something that challenges existing procedures and norms. "Invention is by its very nature a disorderly process," says current CEO George Buckley, who has dialed back many of McNerney's initiatives. "You can't put a Six Sigma process into that area and say, well, I'm getting behind on invention, so I'm going to schedule myself for three good ideas on Wednesday and two on Friday. That's not how creativity works."

- businessweek.com

With unprecedented change and uncertainty in the decades ahead, how do organisations keep their thinking fresh and relevant to "new" problems through "new" thinking? How can C/H/W install an innovative and creative culture that provides challenging and fresh perspectives?

"People have been trying to figure out how to do this for years, and we just came out of left field in response to Darpa," said Abe Sher, chief executive officer of Aqua Sciences. "The atmosphere is a river full of water, even in the desert. It won't work absolutely everywhere, but it works virtually everywhere." Sher said he is "not at liberty" to disclose details of the government contracts, except that Aqua Sciences won two highly competitive bids with "some very sophisticated companies." - Wired.com



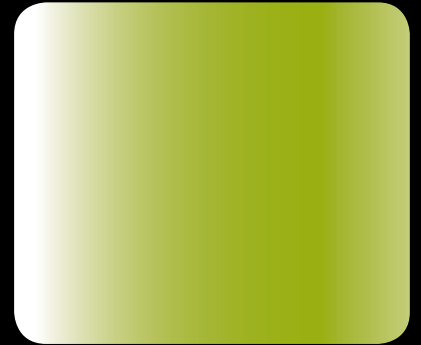
New technologies and solutions are being developed at an accelerating rate. Could C/H/W become increasingly involved in the provision of decentralised products for harvesting, processing and recycling? Under what circumstances would this become a likely outcome? How would C/H/W go about this role? Does C/H/W presently have a good understanding of these technologies and their individual benefits and features?

Could C/H/W's role in the community change with extreme weather events predicted to rise in the future? Could there be more call to work with other entities to provide advice, direction and support for a region coping with various forms of water stress? How would C/H/W work with groups to insure fire safety, avoid dehydration and act as an early warning system?

"With fall sports under way around the country, often in dangerously hot weather conditions, Mobile Sports, Inc. (MSI) today announced the official launch of iHydrate(TM), an innovative iPhone application giving athletes, parents of athletes, coaches, and athletic trainers the tools and information they need to avoid dehydration and other, more serious heat-related illnesses."

- Reuters.com





'This document is an Executive Summary of a much broader and deeper Environmental Scan conducted as part of the Central Highlands Water 2030 Scenarios project and should be read in conjunction with other information from that process. The data in this document offers insights to potential drivers of change and seeks to pose the following question for each item offered - 'In what way could this information shape the future operating environment?'



For any questions regarding this document or its contents, please contact the Strategic Futures consultancy Looking Up Feeling Good Pty Ltd via their website - www.lufg.com.au



Central Highlands Water.

