

**BENALLA**  
RURAL CITY COUNCIL

# Climate Change Adaptation Action Plan 2013-2025

Sustainability  
Fund



Victorian Local  
Sustainability Accord



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A project Steering Committee has been instrumental in informing the development of the Action Plan. The Benalla Rural City Council thanks each of them for their time and commitment to this project. Steering Committee members were:

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The Council Leadership Team has also committed much of their time to analysing risks and identifying actions for this Action Plan. They are:

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Also thank you to Larissa Montgomery, Environmental Sustainability Coordinator at the Benalla Rural City Council for her role in delivering the project.

# Introduction

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## 1. Project Overview

Local governments face many challenges, and some opportunities from climate change and climate variability. To be prepared for the impacts and the opportunities of a changed climate, councils must try to predict what climate change will mean for their municipality and decide what they can do to adapt to changes in climate as they evolve.

This project seeks to develop an Action Plan that will help the Benalla Rural City Council to adapt to future changes in climate. This Action Plan will assist Council to make the necessary changes it needs to make to adequately prepare for the impacts of a changing climate. “Climate change adaptation policy and practice is about making complex value-laden decisions with far reaching, path dependent consequences in the context of highly uncertain knowledge about future climate trends and impacts.”<sup>1</sup> This project uses a risk management approach to address the uncertainty inherent to climate predictions.

## 2. Project Scope

This Action Plan focusses on all areas of Council business across the Benalla Rural City. It is not a plan for community action, however a number of actions focus on the community as community resilience and sustainability are fundamental to Council’s role. The Action Plan has a twelve year life and will be reviewed at the four and eight year mark, consistent with the Council planning cycle.

Two greenhouse gas emissions scenarios were used as the context to assess risks to Council from changes in climate. These were the same emissions scenarios used by the Goulburn Broken Greenhouse Alliance in the preparation of their regional Adaptation Plan. A medium 2030 emissions scenario assumes growth in global annual carbon emissions to remain steady. A high 2070 emissions scenario assumes a business as usual approach to mitigating carbon emissions with considerable growth in global annual carbon emissions by the year 2070.

### 2.1 Regional strategic directions.

Three important regional documents have informed the development of the Benalla Rural City Council Climate Change Adaptation Action Plan.

1. The Goulburn Broken Greenhouse Alliance *Goulburn Broken Local Government Regional Climate Change Adaptation Plan*
2. The North East Greenhouse Alliance *Regional Climate Change Adaptation Strategy*
3. The Hume Strategy for Sustainable Communities

Benalla Rural City Council is a member of both the Goulburn Broken and the North East Greenhouse Alliances. Their work on climate change adaptation for local government is highly relevant to the Benalla Rural City. The Hume Strategy is a broad strategy for regional sustainability that contains several actions applicable to addressing climate change impacts.

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<sup>1</sup> Wiseman, Biggs et. al., 2011, *Scenarios for Climate Adaptation Report June 2011. Executive Summary*

## 2.2 Relationship with key Council strategic documents

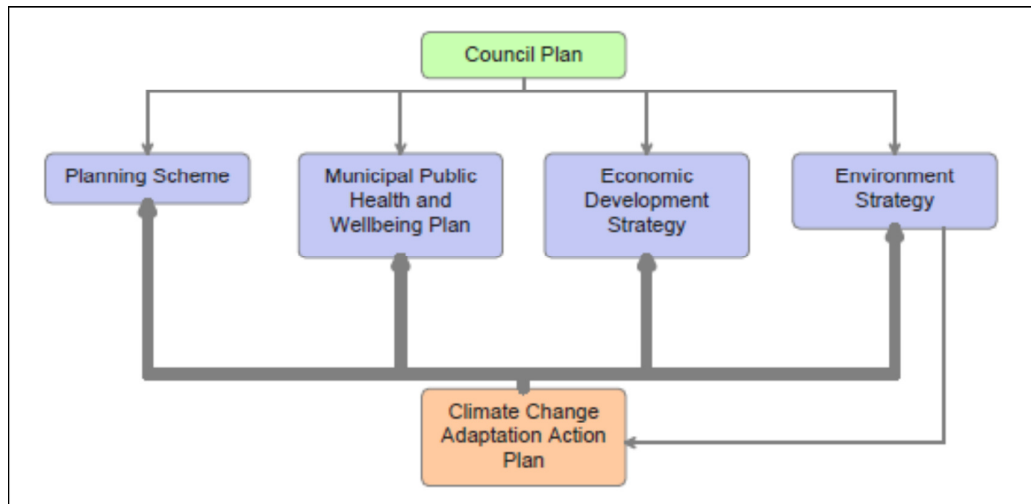


Figure 1: Key Council strategic documents

Figure 1 shows the Benalla Rural City Council's key strategic planning documents. The Climate Change Adaptation Action Plan sits under the Environment Strategy. However, as climate change impacts almost every area of Council business, it simultaneously informs many other Council strategic documents.

The Council Plan sets the overarching directions for Council. Strategic directions are further defined in the *Municipal Strategic Statement* and the *Local Planning Provisions* contained in the *Planning Scheme*; in the *Municipal Public Health and Wellbeing Plan*; in the *Economic Development Strategy*; and in the *Environment Strategy*. A number of other plans and strategies underpin the four mentioned here.

Please see **Appendix Two** for a review of how climate change is incorporated in Council's current strategic documents. Appendix Two contains a review of the key municipal documents. **The review contains eight recommendations for adjustments to be made to the documents when they are next reviewed to ensure they adequately consider the risks posed by climate change.**

## 3. Project Method

The Climate change Adaptation Action Plan was developed over nine month period in 2012. Development consisted of a risk assessment phase and an adaptation action phase.

The risk assessment phase of the project established the expected impacts of climate change on the Benalla Rural City in 2030 under a medium emissions scenario and in 2070 under a high emissions scenario. This allowed project participants to consider impacts on the Benalla Rural City's environment, economy and community in the context of small climate changes and in the context of large climate changes. Impacts from the different emissions scenarios were determined based on the information presented by the Department of Sustainability and Environment in their *Climate change in the Goulburn Broken* document.

A series of four workshops were held with several Council staff and key stakeholders to determine the risks to Council business from the impacts of climate change. Workshop participants were presented with climate change impacts in Benalla and with information regarding specific vulnerabilities in the Benalla community. They were then asked to consider the risks to Council's activities in the areas of planning, economic development, asset management (environmental assets and utilities), community development and facilities, and internal business. The level of risk was rated according to its likelihood and its consequence, as directed by the Australian Standard for risk management detailed by the Australian Government in their *Climate change impacts and risk management: A guide for business and government*. The table of risks compiled in the risk assessment phase of this project can be found in **Appendix one**.

The second phase of the project used the risk assessment to inform ideas for actions that would help Council to reduce the identified risks from climate change impacts. A workshop and follow-up meeting were conducted with the Council Leadership Team to determine actions.

The final step to identifying adaptation actions involved reviewing the three key regional strategic documents. Actions that are relevant for the Benalla Rural City Council were taken from each of the three documents and included in this Action Plan. The three documents are discussed above in section 2.1: Regional strategic directions.

### **3.1 Monitoring and Review**

The Climate Change Adaptation Action Plan will be renewed after twelve years. Intermediary monitoring and review of the Action Plan will occur after four and eight years, in conjunction with the Council planning cycle. Some baseline data has been collected and filed during the planning phase for the Action Plan in 2012.

To ensure there are appropriate processes for monitoring and reviewing the Adaptation Action Plan, two of the actions pertain to embedding climate change and the actions in this Adaptation Action Plan into all Council reports and into performance planning templates. These are:

- 8.1. Processes are in place to ensure climate change risk and adaptation opportunities are addressed in every new report
- 8.2. Staff should be required to report on how climate change risk has been addressed in annual reports and performance reviews

Success indicators have been built into the Action Plan. Staff will be required to report on those actions they are responsible for.

## **4. Report Structure**

This report consists of an introduction covering an overview of the project, the scope, and the project method; background information including a summary of climate change projections for Benalla and an outline of the Council policy on responding to climate change; and an Action Plan component. The Action Plan contains a visual representation of the themes, outcomes and actions of the Plan, followed by a detailed table of actions. Two appendices accompany the main document – Appendix one details the risk tables compiled in the risk assessment phase of the project; Appendix two comprises the review of key municipal documents.

# Background

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## 5. Benalla Rural City – A snapshot view

The Benalla Rural City covers 2350 square kilometres. The majority of land is in non-irrigated agriculture, making agriculture – a climate-dependent industry – a significant proportion (12%) of the economy. Manufacturing, another climate-dependent industry due to the water demand, accounts for a further 19% of the economy.<sup>2</sup>

Thirty per cent of land in the Benalla Rural City is public land. Native vegetation tends to be of high conservation value due to historical high rates of vegetation removal, making that which is left, rare and vulnerable.<sup>3</sup> Socially, Benalla is a community with strong social connections but contains substantial pockets of disadvantage.<sup>4</sup>

Benalla has a temperate climate with average temperatures ranging between 9°C and 22°C. Rainfall averages 668mm annually.<sup>5</sup> These figures hide considerable variation, with temperatures falling to below freezing in winter and climbing to above 40°C in summer. Rainfall varies between 260mm and 1250mm annually.<sup>6</sup>

### 5.1 Climate Change in the Goulburn-Broken

In 2008 the Department of Sustainability and Environment published a summary of how the climate is expected to change and how those changes will impact the Goulburn-Broken Region, consistent with the 2007 CSIRO climate change projections. The ways the climate is expected to change under a medium emissions 2030 scenario and a high emissions 2070 scenario for the Goulburn-Broken region are detailed below in Table 1.<sup>7</sup>

Medium 2030 Scenario	High 2070 Scenario
Assumes CO2 emissions increase moderately until the middle of the century before declining. By 2100 a global temperature increase of 2.8°C (1.7 to 4.4°C) is likely.	Assumes continued strong economic growth dependent on fossil fuels. CO2 concentrations triple relative to pre-industrial levels. A global temperature increase of 4.0°C (2.4 to 6.4°C) is likely.

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<sup>2</sup> Benalla Rural City Council, 2011, *Environment Strategy*, p14.

<sup>3</sup> Benalla Rural City Council, 2011, *Environment Strategy*, p15.

<sup>4</sup> Arold, N., Kinrade, P., 2012, *Climate Change in North East Victoria: Socioeconomic Resilience Plan*, North East Greenhouse Alliance, Wodonga.

<sup>5</sup> Bureau of Meteorology, [http://www.bom.gov.au/climate/averages/tables/cw\\_082002.shtml](http://www.bom.gov.au/climate/averages/tables/cw_082002.shtml) accessed 21 August 2012.

<sup>6</sup> Bureau of Meteorology, [http://www.bom.gov.au/climate/averages/tables/cw\\_082002.shtml](http://www.bom.gov.au/climate/averages/tables/cw_082002.shtml) accessed 21 August 2012.

<sup>7</sup> Department of Sustainability and Environment, 2008, *Climate change in the Goulburn Broken*, Department of Sustainability and Environment, Melbourne.

Changes in rainfall patterns, including an increase in high-volume rainfall events	Changes in rainfall patterns, including an increase in high-volume rainfall events
Temperature about 0.8°C warmer with greatest increase in summer.	Temperature will be another 2.7°C warmer with greatest increase in summer – Benalla more like Hay in temperature. More like Rutherglen in rainfall averages.
Number of hot days to increase.	Number of hot days to increase.
Number of cold days to decrease.	Number of cold days to decrease further.
Reduction in total annual rainfall of around 3% with greatest reductions in spring (7%).	Rainfall to decrease even further, with greatest reductions in spring.
Increase in evaporation and reduction of relative humidity mean conditions should be drier.	Conditions will be increasingly drier due to increased evaporation and reduced relative humidity.
Although average changes in temperature, rainfall and evaporation will have long term consequences for the region, the impacts of climate change are more likely to be felt through extreme events such as the number of hot days, reductions in the number of frosts and changes in daily rainfall patterns. Bushfire risk is also expected to increase, as the number of hot days increases and the length of the season increases.	

Table 1: Climate Change Scenarios

## 5.2 Impacts from climate change in the Goulburn-Broken

The changes in climate in table 1, above, will have a number of impacts on the Goulburn-Broken region. These are<sup>8</sup>:

### WATER

- Decreases in rainfall and higher evaporation rates will mean less soil moisture and less water for rivers.
- Our demand for water may also increase as a result of warmer temperatures and as our population grows.
- Average annual runoff in the Goulburn and Broken rivers is expected to decrease by up to 35% by 2030.
- By 2070, runoff decreases to both rivers could exceed 50%.
- Lower flows and higher temperatures may also reduce water quality within the catchment and create a more favourable environment for potentially harmful algal blooms.
- Greater bushfire activity could temporarily contaminate water catchments with sediments and ash.

<sup>8</sup> Department of Sustainability and Environment, 2008, *Climate change in the Goulburn Broken*, Department of Sustainability and Environment, Melbourne.



### SALINITY

- Salinity could decrease as the water table drops.
- However the salt concentration in rivers may rise as with less rain to dilute surface salt, and increased evaporation from waterways, water may become saltier.

### PRIMARY PRODUCTION

- Higher levels of atmospheric carbon dioxide *may* enhance plant growth and water-use efficiency in some circumstances.
- Changes in temperature and rainfall are likely to offset these benefits.
- Any reduction in rainfall will place most farms under stress, particularly when linked to higher temperatures.
- For standard dryland cropping practices, reductions in rainfall and increases in evaporation directly contribute to reductions in soil moisture.
- Irrigated agriculture is likely to be affected by tighter constraints on water allocations, possibly resulting in a more developed and competitive water market.
- There could be increased heat stress on dairy cattle, reducing milk production unless management measures such as shade sheds and sprinklers are adopted.
- Some fruit crops that need winter chilling may have a reduction in quality and in yield.
- Other crops *may* benefit from a reduction in the risk of damaging frosts.
- Choice in variety of grapes may need to change to suit warmer conditions.
- Other climate change impacts such as heavy rains and winds from storm events will also contribute to crop damage and soil erosion.
- Indirect impacts due to changes in weeds, pests and international markets may also place farms under stress.

### BIODIVERSITY

- Species may alter distribution, abundance, behaviour and the timing of events such as migration or breeding.
- The most susceptible species will be those with restricted or specialised habitat requirements, poor dispersal abilities or small populations.
- There may be increased pressure from competitors, predators, parasites, diseases and disturbances (such as bushfire or drought).
- The composition of ecosystems and their distribution may change through altering water flows in rivers and wetlands and the occurrence of bushfires, snow and floods.
- Existing threats likely to be amplified, such as habitat loss and invasive species, making their impacts considerably worse.

### COMMUNITIES

- Climate change has the potential to influence human health from direct effects such as heatwaves, or indirectly – such as bushfires leading to poor air quality and increased respiratory problems.
- Warmer winters are likely to reduce some cold-related illnesses.
- Warmer summers are likely to increase the risk of heat-related health problems.
- The increased frequency and intensity of heatwaves may cause deaths through heart attack, stroke and heat exhaustion.
- The most vulnerable are the elderly, people under intense physical stress and those with cardiovascular disease.
- High temperatures are also linked to:
  - increased hospital admissions and deaths (particularly among the elderly) relating to heat stress, sunburn and dehydration;
  - more outdoor work-related accidents and reduced productivity;

- buckling of railway lines;
- greater peak electricity demand for air conditioners;
- reduced energy demand for heating in winter.
- Changes in the average climate will affect the design and performance of our buildings and infrastructure – including shifting energy use from winter heating to summer cooling.
- More extreme events such as flash flooding and bushfires will also impact on the built environment and will need to be considered to minimise risk to property.
- The availability and cost of insurance may also change as a result of extreme events.
- Essential infrastructure such as water, power, transport and telecommunications have also been identified as being at high risk at higher levels of projected warming by 2030 without action being taken to prepare for these changes.

The impacts of climate change pose a range of risks to Council. Broadly summarised, the risks identified in risk assessment workshops include rising resource costs, increased stress to employees, infrastructure that is unable to cope with higher temperatures and increased rainfall intensity, increased vulnerability in the community, the economy and the environment, and increased incidents requiring the mobilisation of emergency management resources. The full risk assessment tables can be found in Appendix One.

## 6. Commitment to Climate Change

As in the Benalla Rural City Council *Environment Strategy*, Council will apply the following principles to the implementation of the Climate Change Adaptation Action Plan:

- **Participation:** Early and honest engagement with the community around significant actions, including engagement with youth.
- **Working together:** Development and maintenance of relationships to achieve our goals – includes using local service providers where possible.
- **Justifiable:** All actions will be subject to normal Council risk assessment mechanisms including social and economic analysis where this is appropriate (i.e. for projects likely to have significant impacts or costs).
- **Empowerment:** Education and information will be designed to support people to take action in their own way.
- **Respect:** We will respect different views and ideas, try to accommodate them where possible, and provide a reasonable explanation where it's not possible.
- **Accountability:** We will be accountable for the actions we deliver and the immediate outcomes we expect to attain.
- **Continuous improvement:** We will monitor our progress, report to the community, and involve the community in planning for improvement.

In addition, Council will include consideration of climate change risks, where relevant, in all future strategic planning and reporting. Actions 8.1 and 8.2 support the mainstreaming of climate change into all Council business through the incorporation of climate change considerations into current reporting arrangements. The recommendations made as part of the municipal document review (Appendix 2), will be implemented to ensure current key Council documents include relevant climate considerations as they come up for review.

# Action Plan

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## 7. Project Outcomes and Actions

The Action Plan consists of four main themes, each of which are underpinned by a series of outcomes and actions. The four themes are:

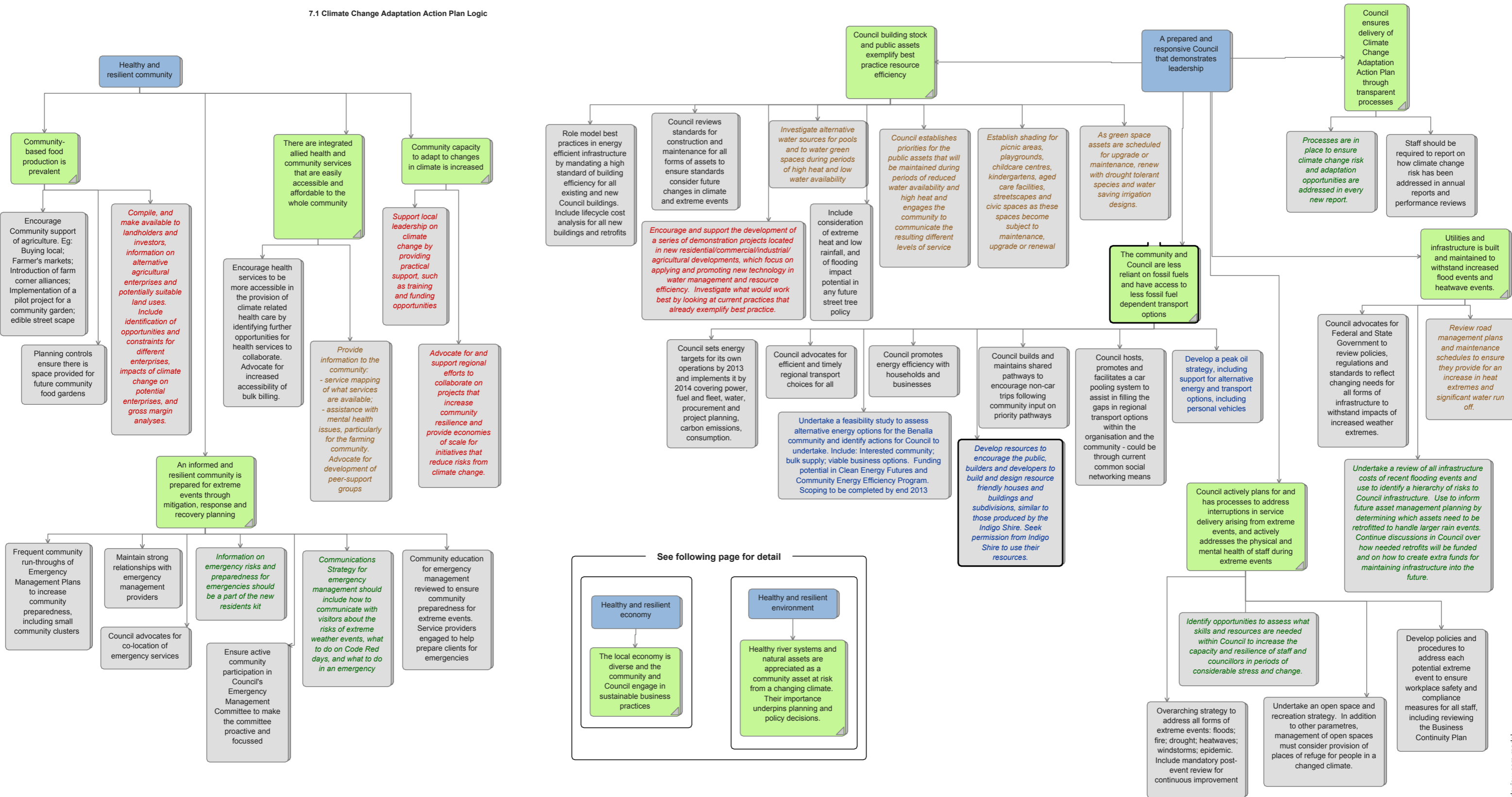
- Healthy and resilient community
- Healthy and resilient environment
- A prepared and responsive Council that demonstrates leadership
- Healthy and resilient economy

The following logic tree shows the relationships between outcomes and actions for each of the four themes.

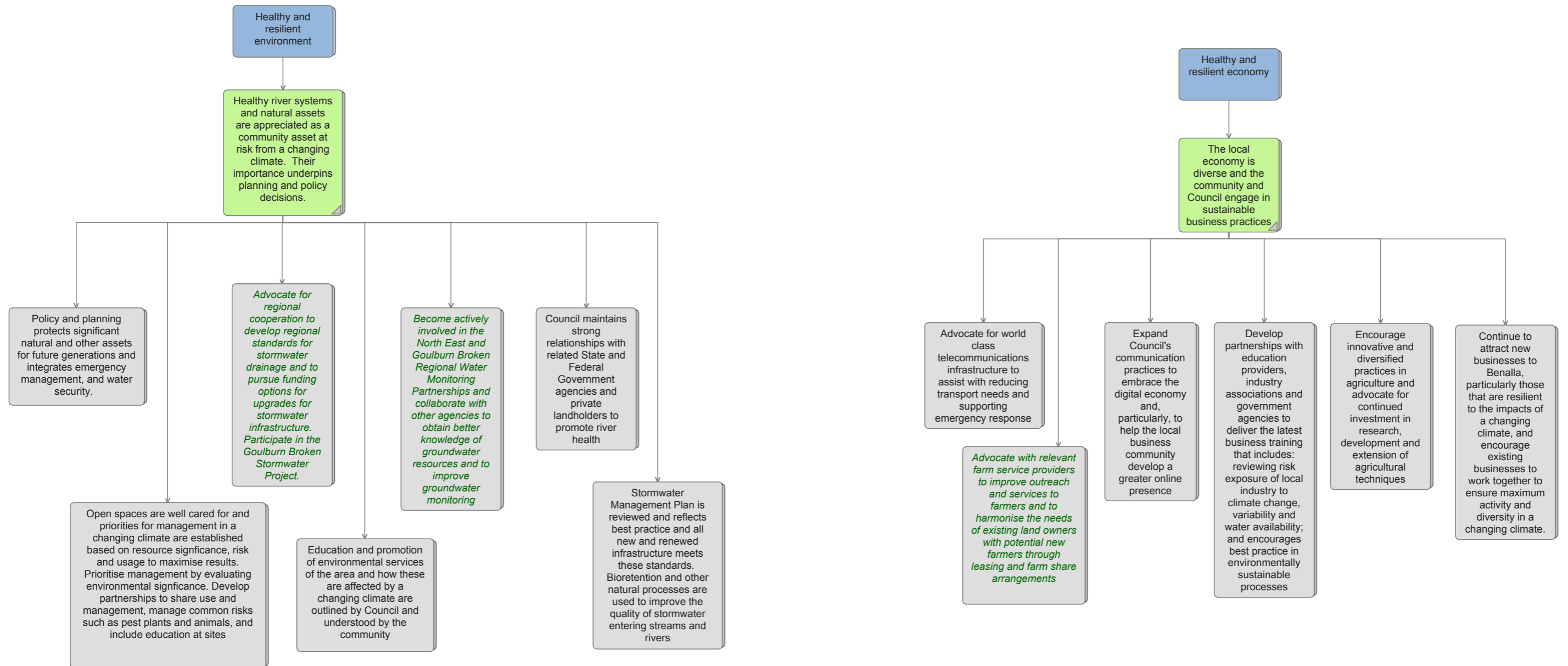
### 7.1 Logic Tree

Figure 2: Logic Tree

7.1 Climate Change Adaptation Action Plan Logic



## Climate Change Adaptation Action Plan



- Black - Action source is the Benalla Rural City Council Leadership Team
- Green - Action source is the North East Greenhouse Alliance
- Brown - Action source is the Goulburn Broken Greenhouse Alliance
- Red - Action source is the Hume Strategy
- Blue - Action source is the Climate Change Adaptation Action Plan Steering Committee

## 7.2 Action Plan

The actions contained in this plan will be implemented by the Benalla Rural City Council over a period of twelve years. An indication of Council area of responsibility and of the resources required for implementation is provided against each action. Many actions are intended to be implemented by Council staff within existing resource allocations by incorporating the action into annual departmental business plans.

A number of actions in the plan require an additional allocation of resources, which will be sought through external funding opportunities and internal budget allocations over the twelve year period.

The Action Plan details funding arrangements for each action, expected time of implementation and area of responsibility, and success indicators. It also assesses the number of risks addressed. Numbers in the risk column denote the risk number in the risk table in Appendix One. The Action Plan also details benefits and risks addressed by each action outside of climate change adaptation.

Actions	Funding	Risks Addressed	Benefits outside of climate change adaptation	Risks addressed outside of climate change	Implementation schedule and responsibility	Success Indicators
<b>Healthy and Resilient Community</b>						
<b>1. Community based food production is prevalent</b>						
1.1 Encourage Community support of agriculture. Eg: Buying local; Farmer's markets; Introduction of farm corner alliances; Implementation of a pilot project for a community garden; edible street scape	Medium funding required. New Council capacity required, either a committee or new staff member. SUBJECT TO ADDITIONAL FUNDING	3, 39, 42, 44, 46, 47, 52, 61	Support local agriculture, build community connections	Food supply	2017 AND ONGOING: Manager Economic Development and Tourism, Environmental Sustainability Coordinator, Manager Community Development.	Various support means are implemented and reported. Local food sold locally.
1.2 Planning controls ensure there is space provided for future community food gardens	Medium funding required. New Council capacity required, either a committee or new staff member. SUBJECT TO ADDITIONAL FUNDING	3, 4, 61	Support local agriculture, build community connections	Food supply	2017: Manager Development. Potential to incorporate with other Planning Scheme reviews	Documentation of consideration in next Planning Scheme review
1.3 Compile, and make available to landholders and investors, information on alternative agricultural enterprises and potentially suitable land uses. Include identification of opportunities and constraints for different enterprises, impacts of climate change on potential enterprises, and gross margin analyses.	Low - resources required. SUBJECT TO ADDITIONAL FUNDING	61, 63, 64, 65, 66,	Sustainable land uses, support local agriculture	Food supply, inappropriate land use	2014: Manager Economic Development and Tourism.	Information is available and accessible. 'Innovation in Farming' workshop conducted.
<b>2. There are integrated allied health and community services that are easily accessible and affordable to the whole community</b>						
2.1 Encourage health services to be more accessible in the provision of climate related health care by identifying further opportunities for health services to collaborate. Advocate for increased accessibility of bulk billing.	Existing Resources	39	Support public health	Increased need for health services	ONGOING: Manager Community Services	Documented identification of opportunities and advocacy.

Actions	Funding	Risks Addressed	Benefits outside of climate change adaptation	Risks addressed outside of climate change	Implementation schedule and responsibility	Success Indicators
2.2 Provide information to the community: service mapping of what services are available; assistance with mental health issues. Particularly for the farming community. Advocate for development of peer-support groups	Low to medium funding required. Advancing Country Towns Project 2011-2015 possibility.	39, 44, 45, 47, 54	Support public health	Increased need for health services	2013: Health and Wellbeing Action Team and Manager Community Services	Information is available and accessible.
<b>3. An informed and resilient community is prepared for extreme events through mitigation, response and recovery planning</b>						
3.1 Frequent community run-throughs of Emergency Management Plans to increase community preparedness, including small community clusters	Low - resources required. Council funded.	22, 37, 58, 75, 77, 78, 80	Efficient and effective emergency management, Increased community confidence	Emergency events	ONGOING FROM 2014: Manager Facilities.	Documented community run throughs are numerous and include small rural communities
3.2 Maintain strong relationships with emergency management providers	Existing funds and capacity	22, 37, 43, 58, 75, 77, 78	Efficient and effective emergency management, Increased community confidence	Emergency events	ONGOING: General Managers - Development and Environment, and Corporate and Community	Partnership structure is officially maintained
3.3 Council advocates for co-location of emergency services	Existing funds and capacity	22, 37, 43, 58, 75, 77, 78	Efficient and effective emergency management, Increased community confidence	Emergency events	ONGOING: Chief Executive Officer	Meeting minutes reflect advocacy
3.4 Community education for emergency management reviewed to ensure community preparedness for extreme events. Service providers engaged to help prepare clients for emergencies	Low - resources required. Council funded.	22, 37, 43, 58, 75, 77, 78	Efficient and effective emergency management, Increased community confidence	Emergency events	ONGOING: Emergency Management Team	Details of community education campaigns. Future community surveys indicate a prepared community
3.5 Ensure active community participation in Council's Emergency Management Committee to make the committee proactive and focussed	Low - resources required. Funds available.	22, 37, 43, 58, 75, 77, 78, 80	Efficient and effective emergency management, Increased community confidence	Emergency events	ONGOING: Inter-agency Emergency Management Group.	Documented community participation
3.6 Information on emergency risks and preparedness for emergencies should be a part of the new residents kit	Existing resources	22, 37, 39, 43, 58	Efficient and effective emergency management, Increased community confidence	Emergency events	2013: Manager Customer Relations	New residents kit includes this information
3.7 Communications Strategy for emergency management should include how to communicate with visitors about the risks of extreme weather events, what to do on Code Red days, and what to do in an emergency	Existing resources	43, 72	Efficient and effective emergency management, Increased community confidence	Emergency events	2014: Emergency Management Team	There is a communications strategy for communicating risks of extreme events and this includes communication with visitors. Copy located at Visitor Info Centre.

Actions	Funding	Risks Addressed	Benefits outside of climate change adaptation	Risks addressed outside of climate change	Implementation schedule and responsibility	Success Indicators
<b>4. Community capacity to adapt to changes in climate is increased</b>						
4.1 Support local leadership on climate change by providing practical support, such as training and funding opportunities	Existing resources	34, 45, 49, 59, 60	Support community groups	Poor perception of Council support of community groups	ONGOING: General Manager Environment and Development, and Manager Economic Development and Tourism	Recorded incidences of community groups receiving Council support
4.2 Advocate for and support regional efforts to collaborate on projects that increase community resilience and provide economies of scale for initiatives that reduce risks from climate change.	Existing resources - commitment to projects may require additional funding	Many	Increased community resilience; many other potential benefits depending on the project	Lack of funding to support initiatives	ONGOING: General Manager - Development and Environment	Participation in the regional Greenhouse Alliances and active support for their regional projects
<b>Healthy and Resilient Economy</b>						
<b>5. The local economy is diverse and the community and Council engage in sustainable business practices</b>						
5.1 Advocate for world class telecommunications infrastructure to assist with reducing transport needs and supporting emergency response	Very Low - resources required. Council funded.	72, 77	Attractive for businesses		ONGOING: Manager Economic Development and Tourism.	Documented advocacy in meeting minutes
5.2 Expand Council's communication practices to embrace the digital economy and, particularly, to help the local business community develop a greater online presence	Existing resources. Very low resources required to involve local business community.	72, 73, 77, 81	Easier to connect with regional networks. Better targeted communication. Greater versatility in the business community.		ONGOING as able: Manager Customer Relations and Manager Economic Development and Tourism	Increased frequency in the use of digital communications, as reported by staff. Increased website hits, particularly on the economic development section of the website
5.3 Develop partnerships with education providers, industry associations and government agencies to deliver the latest business training that <b>Includes: reviewing risk exposure of local industry to climate change, variability and water availability; and encourages best practice in environmentally sustainable processes</b>	Medium - resources required. SUBJECT TO ADDITIONAL FUNDING	61, 62, 63, 64, 66	Increased business diversity	Declining economic base	2020: Manager Economic Development and Tourism.	Business training addressing these issues is implemented
5.4 Encourage innovative and diversified practices in agriculture and advocate for continued investment in research, development and extension of agricultural techniques	Medium - resources required. SUBJECT TO ADDITIONAL FUNDING	61, 68	Enhance rural communities	Decline of rural communities	2017: Manager Economic Development and Tourism.	Documented discussion with DPI and VFF. Information available on innovative and diversified agricultural practices



Actions	Funding	Risks Addressed	Benefits outside of climate change adaptation	Risks addressed outside of climate change	Implementation schedule and responsibility	Success Indicators
5.5 Continue to attract new businesses to Benalla, particularly those that are resilient to the impacts of a changing climate and encourage existing businesses to work together to ensure maximum activity and diversity in a changing climate	Existing resources - Economic Development ACT 2011-2015	61, 62, 63, 64, 66	Increased business diversity	Declining economic base	ONGOING: Manager Economic Development and Tourism	Documented activities to support new businesses and collaboration between existing businesses.
5.6 Advocate with relevant farm service providers to improve outreach and services to farmers and to harmonise the needs of existing land owners with potential new farmers through leasing and farm share arrangements	Very Low - resources required. Council funded.	61, 68	Enhance rural communities	Decline of rural communities	ONGOING: Manager Economic Development and Tourism.	Documented discussion with DPI and VFF. Information available on innovative and diversified agricultural practices
<b>Healthy and Resilient Environment</b>						
<b>6. Healthy river systems and natural assets are appreciated as a community asset at risk from a changing climate. Their importance underpins planning and policy decisions.</b>						
6.1 Stormwater Management Plan is reviewed and reflects best practice and all new and renewed infrastructure meets these standards. Bioretention and other natural processes are used to improve the quality of stormwater entering streams and rivers	Capacity to implement after 2015. Low resources required. Council funded.	1, 9, 10, 11	Better stormwater management	Flood risk and damage to infrastructure from poor drainage	2016: Manager Infrastructure.	Stormwater Management Plan is reviewed and includes identified processes
6.2 Advocate for regional cooperation to develop regional standards for stormwater drainage and to pursue funding options for upgrades for stormwater infrastructure. Participate in the Goulburn Broken Stormwater Project	Existing resources	1, 9, 10, 11	Better stormwater management	Flood risk and damage to infrastructure from poor drainage	ONGOING: Manager Infrastructure liaising with North East Greenhouse Alliance	Minutes from discussions with GM and NE Water Authorities
6.3 Become actively involved in the North East and Goulburn Broken Regional Water Monitoring Partnerships and collaborate with other agencies to obtain better knowledge of groundwater resources and to improve groundwater monitoring	Low - medium resources required. Council funded.	2, 7, 26, 31, 32	Better relationships with regional water authorities	Water pollution	ONGOING: General Manager Development and Environment. Implement in conjunction with the Goulburn Broken and North East Greenhouse Alliances.	Documented involvement with the two Regional Water Monitoring Partnerships
6.4 Council maintains strong relationships with related State and Federal Government agencies and private landholders to promote river health	Existing resources	2, 7, 19, 27, 30, 31, 32, 33	Better relationships with other agencies; improved river health	Decreased river health	ONGOING: General Manager - Development and Environment	Collaboration with GBCMA

Actions	Funding	Risks Addressed	Benefits outside of climate change adaptation	Risks addressed outside of climate change	Implementation schedule and responsibility	Success Indicators
6.5 Open spaces are well cared for and priorities for management in a changing climate are established based on resource significance, risk and usage to maximise results. Prioritise management by evaluating environmental significance, prioritise management actions, develop partnerships to share use and management, management of common risks such as pest plants and animals, include education at sites	Medium - resources required. SUBJECT TO ADDITIONAL FUNDING	5, 23, 24, 25, 26, 27, 29, 31, 32, 34, 50, 55	Recreation, tourism, ecosystem health	Threats to biodiversity	2021: Manager Facilities and Environmental Sustainability Coordinator	Documented management priorities
6.6 Education and promotion of environmental services of the area and how these are affected by a changing climate are outlined by Council and understood by the community	Existing resources using existing communications avenues	5, 23, 24, 25, 26, 27, 29, 31, 32, 34, 50, 55	Recreation, tourism, ecosystem health	Threats to biodiversity	ONGOING UPDATED YEARLY: Environmental Sustainability Coordinator	Information is available and accessible.
6.7 Policy and planning protects significant natural and other assets for future generations, and integrates emergency management and water security.	Tie in to scheduled Planning Scheme renewal. Review existing plans and strategies. Would need medium resources for background research documents. Council funded, may need ADDITIONAL FUNDING for some aspects.	1, 3, 4, 5, 8, 19, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34	Recreation, tourism, ecosystem health, river health, water supply	Threats to biodiversity; threats to river health	ONGOING: General Manager Development and Environment. Changes not likely to come into effect until 2015 onwards.	Planning scheme review incorporates natural assets
<b>A Prepared and Responsive Council that Demonstrates Leadership</b>						
<b>7. Council actively plans for and has processes to address interruptions in service delivery arising from extreme events, and actively addresses the physical and mental health of staff during extreme events</b>						
7.1 Overarching strategy to address all forms of extreme events: floods; fire; drought; heatwaves; windstorms; epidemic. Include mandatory post-event review for continuous improvement	Low - resources required. Funds available.	1, 6, 9, 10, 21, 22, 25, 26, 33, 36, 37, 39, 43, 50, 58, 71, 72, 73, 74, 75, 76, 77, 78, 80	Public safety, Community view of Council as a leader	Emergency response	ONGOING: Inter-agency Emergency Management Group.	Municipal Emergency Response Strategy is in place
7.2 Develop policies and procedures to address each potential extreme event to ensure workplace safety and compliance measures for all staff, including reviewing the Business Continuity Plan	Low - resources required. Council funded.	73, 74 75, 76, 77, 78, 80	Positive staff work dynamics	OH&S, Business continuity in an emergency	Policy for extreme weather adopted. ONGOING: General Manager Corporate and Community.	Policies adopted. Business Continuity Plan reviewed

Actions	Funding	Risks Addressed	Benefits outside of climate change adaptation	Risks addressed outside of climate change	Implementation schedule and responsibility	Success Indicators
7.3 Identify opportunities to assess what skills and resources are needed within Council to increase the capacity and resilience of staff and councillors in periods of considerable stress and change.	Low - resources required. Assessment Council funded. Delivery may need ADDITIONAL FUNDING	73, 75, 76, 77, 78, 79, 80	Positive staff work dynamics	OH&S, Business continuity in an emergency	Assessment complete by 2014: Manager People and Performance. Delivery ongoing.	Staff report good level of support in times of stress
7.4 Undertake an open space and recreation strategy. In addition to other parameters, management of open spaces must consider provision of places of refuge for people in a changed climate.	Medium - resources required. SUBJECT TO ADDITIONAL FUNDING	34, 50, 55, 69, 71	Increased community connectedness, Focus on public health and wellbeing, attract tourists	Decreased public health/increased obesity, decreased community connections	2016: Manager Facilities.	Open space and recreation strategy is adopted
<b>8. Council ensures delivery of Climate Change Adaptation Action Plan through transparent processes</b>						
8.1 Processes are in place to ensure climate change risk and adaptation opportunities are addressed in every new report	Existing resources	All risks	Council delivers what is promised	Plan not implemented	2013: General Manager Corporate and Community	Processes are in place
8.2 Staff should be required to report on how climate change risk has been addressed in annual reports and performance reviews	Existing resources - performance planning and annual reviews	All risks	Council delivers what is promised	Plan not implemented	2013: Chief Executive Officer and Manager People and Performance	Templates include assessment of climate change risk
<b>9. Council building stock and public assets exemplify best practice resource efficiency</b>						
9.1 Council reviews standards for construction and maintenance for all forms of assets to ensure standards consider future changes in climate and extreme events	Low - resources required. Council funded.	4, 11, 12, 40, 41, 46, 52	Longer life of assets	Decline in condition of assets	ONGOING: Manager Infrastructure. Role out as standard practice.	Standards reviewed and reflect climate considerations
9.2 Council establishes priorities for the public assets that will be maintained during periods of reduced water availability and high heat and engages the community to communicate the resulting different levels of service	Very Low - resources required. Council funded.	27, 50, 55	Recreation, tourism	Community discontent	ONGOING: Manager Community Services. Incorporate into Heatwave Strategy.	Priorities are established and information is available and accessible
9.3 Establish shading for picnic areas, playgrounds, childcare centres, kindergartens, aged care facilities, streetscapes and civic spaces as these spaces become subject to maintenance, upgrade or renewal	Very Low - additional resources required. Council funded. May seek additional funding.	53, 55	Recreation	Community discontent	ONGOING: Manager Facilities.	Shading established in new locations
9.4 Investigate alternative water sources for pools and to water green spaces during periods of high heat and low water availability	Very Low - resources required. Council funded.	8, 29, 30, 50, 55	Recreation, tourism, water saving measures	Water supply, declining public amenity	2015: Manager Infrastructure.	Documented options available

Actions	Funding	Risks Addressed	Benefits outside of climate change adaptation	Risks addressed outside of climate change	Implementation schedule and responsibility	Success Indicators
9.5 As green space assets are scheduled for upgrade or maintenance, renew with drought tolerant species and water saving irrigation designs.	Existing resources if original maintenance scheduling is kept. May need additional funds.	8, 24, 25, 29, 30, 50, 55	Recreation, tourism, water saving measures	Water supply, declining public amenity	ONGOING: Manager Facilities	Drought tolerant species are planted in upgraded green space. Irrigation design results in increased water saving
9.6 Role model best practices in energy efficient infrastructure by mandating a high standard of building efficiency for all existing and new Council buildings. Include lifecycle cost analysis for all new buildings and retrofits	Existing resources - budgets may need supplementing	52, 53, 81	Council showing leadership, decreased energy costs to Council, mitigation of emissions	Negative public perception of Council, rising resource costs	2016: Chief Executive Officer	New and re-newed Council buildings are resource efficient
9.7 Encourage and support the development of a series of demonstration projects located in new residential/commercial/industrial/agricultural developments, which focus on applying and promoting new technology in water management and resource efficiency. Investigate what would work best by looking at current practices that already exemplify best practice	Very Low - resources required. DBI Infrastructure Grant.	2, 4, 35, 46, 52	Council showing leadership, decreased energy costs to Council, mitigation of emissions	Negative public perception of Council, rising resource costs	2014: General Manager Development and Environment. Enterprise Park Project Development.	Appropriate examples are identified and developed
9.8 Include consideration of extreme heat and low rainfall, and of flooding impact potential in any future street tree policy	Existing resources	8, 24, 25, 29, 30, 50	Community amenity	Public safety	2013: Manager Facilities	Street Tree Policy is adopted and includes impacts of heat and flood
<b>10. Utilities and infrastructure is built and maintained to withstand increased flood events and heatwave events.</b>						
10.1 Council advocates for Federal and State Government to review policies, regulations and standards to reflect changing needs for all forms of infrastructure to withstand impacts of increased weather extremes.	Existing resources	2, 6, 11, 12, 14, 15, 45, 46, 52	Public safety		ONGOING: Manager Development.	Avenues of advocacy documented
10.2 Review road management plans and maintenance schedules to ensure they provide for an increase in heat extremes and significant water run off.	Very Low - resources required. Council funded.	11, 12	More durable surfaces	Deterioration in regular extreme weather events	2013: Manager Facilities.	Road management and maintenance provides for increased heat and water runoff

Actions	Funding	Risks Addressed	Benefits outside of climate change adaptation	Risks addressed outside of climate change	Implementation schedule and responsibility	Success Indicators
10.3 Undertake a review of all infrastructure costs of recent flooding events and use to identify a hierarchy of risks to Council infrastructure. Use to inform future asset management planning by determining which assets need to be retrofitted to handle larger rain events. Continue discussions in Council over how needed retrofits will be funded and on how to create extra funds for maintaining infrastructure into the future.	Low - resources required. Council funded.	1, 9, 10, 40, 41, 50	Less damage during flood events	Flood risk and damage to infrastructure from poor drainage	2014: General Manager Development and Environment. Currently in process.	Infrastructure maintained to handle larger and more frequent flood events
<b>11. The community and Council are less reliant on fossil fuels and have access to less fossil fuel dependent transport options</b>						
11.1 Council sets energy targets for its own operations by 2013 and implements it by 2014 covering power, fuel and fleet, water, procurement and project planning, carbon emissions, consumption.	Consider including in 2013-1017 Council Plan. Individual plans/policies may require up to a medium level of increased resources. Council funded.	8, 13, 35, 81	Climate change mitigation, role model for the community, decreased resource costs	Rising resource costs, community confidence in Council as a leader	2014: General Manager Development and Environment. Goulburn Broken Greenhouse Alliance sustainability training used to develop capacity in staff.	Energy targets set and implemented
11.2 Council promotes energy efficiency with households and businesses	Existing resources if partner with BSFG and BBN	35, 42, 46, 48, 62	Decreased resource costs for the community	Rising resource costs	ONGOING: Manager Economic Development and Tourism, and Environmental Sustainability Coordinator	Information is available and accessible.
11.3 Council advocates to State Government for efficient and timely regional transport choices for all	Existing resources	56	Improved accessibility	Community fragmentation, increased vulnerability of the elderly and infirm who are unable to drive	ONGOING: General Manager Environment and Development	Avenues of advocacy documented
11.4 Council builds and maintains shared pathways to encourage non-car trips following community input on priority pathways	Very high - resources required. CONTRIBUTION FROM COUNCIL BUT SUBJECT TO ADDITIONAL FUNDING	55, 56, 69, 71	Tourism, recreation		2025: General Manager Development and Environment. CONTRIBUTION FROM COUNCIL BUT SUBJECT TO ADDITIONAL FUNDING	Increased shared pathways
11.5 Council hosts, promotes and facilitates a car pooling system to assist with filling the gaps in regional transport options within the organisation and the community - could be through current social networking means	Low - resources required. SUBJECT TO ADDITIONAL FUNDING	54, 56	Improved accessibility	Community fragmentation, increased vulnerability of the elderly and infirm who are unable to drive	2015: Manager Community Development.	Car-pooling system implemented
11.6 Develop resources to encourage the public, builders and developers to build and design resource friendly houses and buildings, similar to those produced by the Indigo Shire. Seek permission from Indigo Shire to use their resources.	Low - resources required. SUBJECT TO ADDITIONAL FUNDING.	35, 46, 48, 52	Ease financial burden of increased resource costs on the community	Rising resource costs - impact on the community	2015: Manager Development, and Environmental Sustainability Coordinator.	Resources designed, available and accessible to the community

Actions	Funding	Risks Addressed	Benefits outside of climate change adaptation	Risks addressed outside of climate change	Implementation schedule and responsibility	Success Indicators
11.7 Develop a peak oil strategy, including support for alternative energy and transport options, including personal vehicles	Low - resources required. SUBJECT TO ADDITIONAL FUNDING	44, 48, 67, 81	Ease transition to using renewable resources	Decrease in availability of fossil fuels	2017: General Manager Development and Environment.	Peak Oil strategy in place
11.8 Undertake a feasibility study to assess alternative energy options for the Benalla community and identify actions for Council to undertake. Include: Interested community; bulk supply; viable business options. Funding potential in Clean Energy Futures and Community Energy Efficiency Program. Scoping to be completed by end 2013	High - resources required. SUBJECT TO ADDITIONAL FUNDING. Funding potential in Clean Energy Futures and Community Energy Efficiency Program.	62, 65, 67, 81	Economic diversification, mitigation of emissions, freedom from reliance on fossil fuels	Decrease in availability of fossil fuels	Scoping to be completed by end 2013, project delivered by 2015: Environmental Sustainability Coordinator, and Manager Economic Development and Tourism.	Feasibility study completed

**Colour Key**

Goulburn Broken Greenhouse Alliance

North East Greenhouse Alliance

Hume Strategy

Project Steering Committee

Council Leadership Team

**Funding Key**

Very Low = <\$10000

Low = \$10000-\$100000

Medium = \$100000-\$200000

High = \$200000-\$500000

Very high = >\$500000

## 8. Supporting Literature

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## Appendix 1: Risk Assessment Table

This table was created in the risk assessment phase of the project. Risks were assessed and prioritised during a series of four workshops. The risk assessment process followed that outlined in the Australian Government, 2006, *Climate change impacts and risk management: A guide for business and government*.

No.	Risk	Controls	Risk Priority 2030	Risk Priority 2070	2030 Consequence	2030 Likelihood	2070 Consequence	2070 Likelihood
<b>Planning and Development</b>								
1	Development on the floodplain increases the risks to community safety, particularly in the event of bushfire or floods	Building code; Planning scheme	High	High	Major	Possible	Catastrophic	Possible
2	Increased groundwater and surface water contamination from septic tanks	Domestic waste water strategy; Legislator working with vulnerable communities; Planning	Medium	High	Moderate	Possible	Major	Possible
3	Reduced on-farm productivity and yields leads to increased pressure for land to be subdivided	Rural Land Use Strategy; Planning Scheme; SPPF; LPPF; MSS; Hume Strategy	Medium	High	Minor	Likely	Moderate	Likely
4	Planning and building regulations restrict the capacity of the community to adapt to climate change, causing social decline	DPCD; VCAT; Education programs; Planning Scheme	Medium	Medium	Moderate	Possible	Moderate	Possible
5	Benalla Rural City is no longer an attractive location for 'tree-changers' because of habitat damage	Planning scheme, MSS, Economic Development Strategy	Medium	Medium	Minor	Possible	Minor	Likely
<b>Utilities Asset Management</b>								
6	Council plant, equipment and infrastructure is unable to cope with significant and frequent emergency events	Council Plan; Asset Mangament Plans; Fleet Policy	High	Extreme	Major	Likely	Major	Almost certain

No.	Risk	Controls	Risk Priority 2030	Risk Priority 2070	2030 Consequence	2030 Likelihood	2070 Consequence	2070 Likelihood
7	Increased generation of leachate due to storm events	Evaporation system	High	High	Major	Possible	Major	Possible
8	Restrictions on water during drought impacts costs and time frames of operations	Maintenance schedules; Contract specifications	High	High	Moderate	Likely	Moderate	Likely
9	Increased flood events exceed capacity of drains that exist and speed up decay	Maintenance schedules; budgets	High	High	Major	Possible	Major	Possible
10	Risk of flood damage to the community increases as flood storage capacity of Lake Benalla may decline by 2030.	Lake Benalla Environs	High	High	Major	Possible	Major	Possible
11	Intense rainfall events, compounded when they follow periods of extended dry, increase the maintenance requirements of gravel roads, culverts, bridges, sealed roads and related infrastructure, leading to the potential premature failure of assets	Asset Management Strategies; Budgets; Design Standards	High	High	Major	Possible	Major	Possible
12	Increased high temperature days and solar radiation reduce the life of road surfaces and airport tarmacs, and increase maintenance of related infrastructure (eg: plastic bollards, signs etc)	Road Management Act,	Medium	High	Major	Unlikely	Major	Possible
13	Increased demand on power will impact on service response and communication		Medium	High	Major	Unlikely	Major	Possible
14	Drainage lines and culverts affected by deposition of sediments from increased erosion of over-dry and saline affected soils	Maintenance schedules; budgets	Medium	High	Moderate	Possible	Moderate	Likely
15	Increased risk to public health due to sewer and septic spills	Domestic waste water strategy; Legislator working with vulnerable communities; Planning	Medium	High	Moderate	Possible	Moderate	Likely
16	High rainfall events disrupt project delivery of contracts	Contract specifications	Medium	High	Minor	Possible	Moderate	Likely
17	Non-productive days may increase due to more code-red days and more intense rainfall periods	Contract specifications	Medium	Medium	Minor	Likely	Minor	Likely

No.	Risk	Controls	Risk Priority 2030	Risk Priority 2070	2030 Consequence	2030 Likelihood	2070 Consequence	2070 Likelihood
18	Council is unable to meet utility service delivery objectives because of more extreme-risk bushfire days	Contract specifications	Medium	Medium	Minor	Possible	Minor	Possible
19	Increased salinity in waterways leads to increased corrosion of steel reinforcement in waterways	Maintenance schedules; Budgets; Alternative products	Low	High	Major	Rare	Major	Unlikely
20	High rainfall and extreme heat exceed the operating range of existing plant and machinery (eg: lawn mowers, European fire trucks) or require purchase of new plant and equipment	Budgets; Asset Management Plans; Manufacturing specifications; Work time variations	Low	Low	Minor	Unlikely	Minor	Unlikely
<b>Emergency Management</b>								
21	Network of official fire response vehicles is inadequate	Emergency Management Plan; Municipal Fire Prevention Plan	Medium	High	Major	Unlikely	Major	Possible
22	Network of volunteers is unable to meet the demands of increased bushfire risk	Emergency Management Plan; Municipal Fire Prevention Plan	Medium	High	Major	Unlikely	Major	Possible
<b>Natural Asset Management</b>								
23	Biodiversity and ecosystem services are reduced because of temperature and rainfall changes, either directly or indirectly, such as through increased weeds and pest animals, or through decreased tree stock to provide habitat for other species	Planning scheme; MSS; Environment Strategy; Roadside Management Plan; Biodiversity reference group; Planning permits; Arboreal risk assessment	Extreme	Extreme	Major	Almost certain	Catastrophic	Almost certain
24	Increased numbers of falling trees pose risk to the public	Inspection regimes; Street Tree Policy	High	High	Major	Possible	Major	Likely
25	Drought/flood cycles cause significant mature tree loss	Pruning and removal maintenance schedules	High	High	Major	Possible	Major	Likely
26	Natural assets are damaged from an increase in emergency management activities that impact on the	Municipal Fire Prevention Plan; Emergency	High	High	Major	Possible	Major	Possible

No.	Risk	Controls	Risk Priority 2030	Risk Priority 2070	2030 Consequence	2030 Likelihood	2070 Consequence	2070 Likelihood
	landscape	Management Plan						
27	Increased cost of asset maintenance and natural resource management reduces available budget for managing environmental assets	Budgets; Risk Management planning	High	High	Moderate	Likely	Moderate	Almost certain
28	Increased expectation for Council to manage and enhance roadside habitat for threatened species	Roadside Management Plan; Engagement/consultation with DSE and volunteer groups; EPBC Act; FFG Act	Medium	High	Moderate	Possible	Moderate	Almost certain
29	Decreased rainfall will reduce public amenity around the Lake and will affect parks and retention of street trees	Maintenance budget; Partnership with NE Water	Medium	High	Moderate	Possible	Major	Likely
30	Population increase places increased demand on environmental resources, particularly water	Asset Management Plans	Medium	High	Moderate	Possible	Moderate	Likely
31	Loss of habitat and aquatic species in Lake Benalla	Partnership with GBCMA; Developing Lake Benalla Asset Management Plan	Medium	High	Moderate	Possible	Moderate	Likely
32	Competing demands on Lake Benalla, such as water quality and amenity values, are amplified	Partnership with GBCMA; Developing Lake Benalla Asset Management Plan	Medium	High	Moderate	Possible	Moderate	Likely
33	Increased pressure on roadside native flora and fauna due to potential and perceived increase in bushfire risk	Roadside Management Plan; Engagement/consultation with DSE and volunteer groups; EPBC Act; FFG Act	Medium	High	Moderate	Possible	Moderate	Likely
34	Lack of improvement in natural assets due to pressure on volunteer resources	Supporting and partnering with local volunteer groups	Medium	Medium	Minor	Possible	Minor	Possible
<b>Community Development and Facilities</b>								

No.	Risk	Controls	Risk Priority 2030	Risk Priority 2070	2030 Consequence	2030 Likelihood	2070 Consequence	2070 Likelihood
35	Hot days and heat waves increase local electricity demand, causing blackouts and load sharing	Electrical Company service provision plans; Municipal Emergency Management Plan;	High	Extreme	Major	Likely	Major	Almost certain
36	Floods, fires and Code Red days interrupt the provision for outreach social services	Vulnerability registers; Business Continuity Plans; Heatwave Strategy	High	High	Major	Likely	Major	Likely
37	Deterioration in community connectedness due to declining rural farming population and an increase in 'lifestyle' population that is often absent, leads to a reduction in the community's ability to cope with emergencies and extremes	Community events; Community Planning	High	High	Major	Likely	Major	Likely
38	An increase in 'lifestyle' population leads to a reduction in the community's ability to cope with emergencies and extremes	Community events; Community Planning	High	High	Major	Likely	Major	Likely
39	The cumulative effect of drought or flood events on mental health and community resilience causes a manifestation of social issues, including drug use, gambling, littering, violence, suicide, domestic violence and mental illness	Partnership projects	High	High	Major	Likely	Major	Likely
40	Floods inundate public buildings and assets on the floodplain	Planning schemes; Flood overlays	High	High	Major	Likely	Major	Possible
41	Intense rainfall events, in excess of those accommodated by current design standards, cause significant damage to Council-managed buildings and assets	Design Standards	High	High	Major	Possible	Major	Likely
42	Low socio-economic sectors of the community are unable to adapt to increased energy costs and heatwaves	State Government action as landlords; Vulnerability registers; Heatwave Plan; Municipal Health Plan	High	High	Major	Possible	Major	Possible

No.	Risk	Controls	Risk Priority 2030	Risk Priority 2070	2030 Consequence	2030 Likelihood	2070 Consequence	2070 Likelihood
43	Community is not prepared for emergencies	Municipal Emergency Plan; Education on emergency management preparation	High	High	Major	Possible	Major	Possible
44	Council is generally unable to meet community expectations for community service provision	Communications Strategy; Education; Health and Wellbeing Plan; Heatwave Plan; Community Safety Committee	High	High	Major	Possible	Major	Possible
45	Loss of State Government regional services reduces community capacity to adapt to changes in climate	MAV membership; Local Government Convention; Hume Regional Strategy; Hume RDA	High	High	Moderate	Almost certain	Moderate	Almost certain
46	Housing stock exacerbates impacts of climate variability leading to increased vulnerability in the community	Education; lobbying	High	High	Moderate	Likely	Moderate	Likely
47	Lack of access to public assets and services, particularly for elderly and rural people, disrupts social connections, causing fragmentation and dislocation	Transport Strategy; Community events; Municipal Health and Wellbeing Plans; Communications Strategy	High	High	Moderate	Likely	Moderate	Likely
48	People, particularly as they age, are less able to meet rate obligations, placing pressure on Council to fund services (Council are unable to implement significant rate increases to cover rising costs)	Business Continuity Plan; Budgets	High	High	Moderate	Likely	Moderate	Likely
49	Aging population may lead to a reduction in volunteers as people retire and lose the capacity to do volunteer work	Business Continuity Plan	High	High	Moderate	Likely	Moderate	Likely

No.	Risk	Controls	Risk Priority 2030	Risk Priority 2070	2030 Consequence	2030 Likelihood	2070 Consequence	2070 Likelihood
50	Extreme events, particularly floods, reduce the ability of Council to provide public assets (eg: swimming pools, green spaces, buildings)	Asset Management Plans; Health and Wellbeing Plan; Infrastructure design; Heat wave Plan; Business Continuity Plan	Medium	High	Moderate	Possible	Moderate	Likely
51	Aging population leads to an increase in the demand for services and capacity of Council may not meet demand	Municipal Health Plan; Council Plan; Vulnerability Register	Medium	High	Minor	Likely	Moderate	Likely
52	Current building stock is not ideal for future community needs and climate	Maintenance schedules; budgets;	Medium	High	Minor	Possible	Moderate	Almost certain
53	Council does not have enough places to offer respite to the community on days of heatwaves	Asset Management Strategies	Medium	Medium	Moderate	Possible	Moderate	Possible
54	Health policies lead to elderly people remaining at home even in areas that are rural and isolated. There is a risk that Council struggles to fund and provide these services in a time of climate variability	Heatwave Plan; Municipal Emergency Management Plan; Education on Emergency Planning; Municipal Health Plan	Medium	Medium	Minor	Possible	Moderate	Possible
55	Community recreation will take place in hotter temperatures. Council provision of infrastructure that supports recreation is inadequate in a hotter, drier climate (eg: play equipment, shade provision, rest areas along walkways, aquatic facilities, car parking.	Asset Management Plans; Health and Wellbeing Plan; Infrastructure design; Heat wave Plan	Medium	Medium	Minor	Possible	Minor	Likely
56	Community declines as climatic events decrease public transport availability	Lobby State Government	Medium	Medium	Minor	Possible	Moderate	Possible
57	Parking problems exacerbated in times of hot and wet weather		Medium	Medium	Insignificant	Almost certain	Insignificant	Almost certain
58	Emergency events prevent Council staff from operating the Municipal Emergency Recovery Centre	Municipal Emergency Management Plan	Low	Low	Major	Rare	Major	Rare
<b>Community Relations</b>								

No.	Risk	Controls	Risk Priority 2030	Risk Priority 2070	2030 Consequence	2030 Likelihood	2070 Consequence	2070 Likelihood
59	Development and policy changes to respond to climate change impacts cause political discontent in the community	VCAT; Elections; Educational programs	Medium	Medium	Minor	Likely	Moderate	Possible
60	Community expectations may not change to match any decrease in Council capacity	Budget; service standards	Medium	Medium	Minor	Likely	Moderate	Possible
<b>Economic Development</b>								
61	Ongoing drought reduces agricultural output, resulting in reductions in employment and economic activity	Future Farming Strategy; Environment Strategy	High	High	Major	Likely	Major	Likely
62	Federal and State regulatory action on carbon emissions results in loss of businesses and investment from Benalla	Economic Development Strategy; Education	High	High	Major	Possible	Major	Possible
63	Water restrictions result in loss of businesses and investment from Benalla	Economic Development Strategy; Education	High	High	Major	Possible	Major	Possible
64	Droughts and extreme weather events reduce perceived attractiveness to skilled employees and investors, in turn reducing the skilled labour, investment and productivity of the municipality	Economic Development Strategy; Recruitment; Hume Regional Plan; Environment Strategy	High	High	Moderate	Likely	Moderate	Likely
65	Benalla stagnates in the event it does not seize innovation opportunities presented by climate change	Economic Development Strategy - Innovation; Greenhouse Alliance Memberships; Broadband Alliance Group	Medium	High	Moderate	Possible	Major	Possible
66	Regulatory requirements, introduced to reduce the impacts of extreme events, decrease investment opportunities and discourage investment in the region	Economic Development Strategy; Council Plan; Building codes; Education; Lobbying State Government	Medium	Medium	Moderate	Possible	Moderate	Possible
67	Economic development initiatives are unable to be funded as a declining rate base takes effect	Council Plan; Economic Development Strategy	Medium	Medium	Moderate	Possible	Moderate	Possible



No.	Risk	Controls	Risk Priority 2030	Risk Priority 2070	2030 Consequence	2030 Likelihood	2070 Consequence	2070 Likelihood
68	Some industries become seasonal as weather extremes make it difficult to work in hot summers	Economic Development Strategy; Skills Victoria Workforce Plan	Medium	Medium	Minor	Likely	Minor	Almost certain
69	Local businesses are affected by less visitation if there is less water for water-based tourism assets such as Lake Nillahcootie, Lake Benalla and Winton Wetlands	Economic Development Plan	Medium	Medium	Minor	Likely	Minor	Almost certain
70	Extreme weather events place frequent demand on employers to release employees to assist in emergency response and recovery, which decreases the productivity of the workforce	Business Continuity Plans; Municipal Emergency Management Plan	Medium	Medium	Minor	Likely	Minor	Likely
71	Droughts and extreme events reduce tourism product offerings and perceived attractiveness resulting in less tourism visitation	Regional Tourism Board; Tourism Strategy; Environment Strategy; Tourism Committee; Economic Development Strategy; Communications Strategy	Medium	Medium	Minor	Likely	Minor	Likely
72	Communication between the Council and businesses is disrupted by extreme weather events	Relationship with local and ABC radios	Low	Medium	Minor	Unlikely	Moderate	Possible
<b>Internal Business</b>								
73	Extreme events disrupt normal Council operation causing deferral of work, work out of normal hours or new, unplanned, work.	Communications Strategy; Business Continuity Plans; OH&S; Council Plan; Enterprise Bargaining Agreement; Working from home	High	High	Moderate	Likely	Moderate	Likely
74	Invoking emergency management plans more often to respond to more 'events'. Implications for insurance, resource maintenance and non-productive days		High	High	Moderate	Likely	Moderate	Likely

No.	Risk	Controls	Risk Priority 2030	Risk Priority 2070	2030 Consequence	2030 Likelihood	2070 Consequence	2070 Likelihood
75	Council staff are unable to get to work to provide services to the community due to fires, floods, storms and Code Red days	Business Continuity Plans; Working from home; Municipal Emergency Management Plan; Enterprise Bargaining Agreement	Medium	High	Major	Unlikely	Major	Possible
76	Increased risk of OH&S issues as staff are exposed to climate risks	Council OH&S Policy	Medium	High	Major	Unlikely	Major	Possible
77	Storms, fires and floods disturb telecommunications infrastructure and provision in the region, which in turn affects Council's business continuity	Business Continuity Plans	Medium	High	Minor	Likely	Moderate	Almost Certain
78	Less capacity in Council to manage an emergency when staff are dealing with looking after their own families	Rostering; Remote connectivity; Working from home; Enterprise Bargaining Agreement	Medium	Medium	Major	Unlikely	Major	Unlikely
79	Health of staff decreases and stress increases if they are unable to meet community expectations (eg: unable to water green spaces)	OH&S Policies; Training; Employee Assistance Program; Professional Development	Medium	Medium	Moderate	Possible	Moderate	Possible
80	Increased stress for staff with emergency response responsibilities	OH&S policies; training; rostering; flexible work arrangements	Medium	Medium	Minor	Likely	Minor	Likely
81	Cost of running Council's business increases due to rising resource and energy costs, making it difficult for Council to meet costs	Budget; Council Plan; Major Projects	Medium	Medium	Minor	Likely	Minor	Likely

## Appendix 2: Municipal Document Review

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This review looks at key Benalla Rural City Council strategic documents to identify how climate change may already be addressed.

In 2011 the North East Greenhouse Alliance conducted a review of the municipal documents for each of the local governments involved in their *Adapting to a low water future* project to “examine existing reports; analyse reports; identify whether Climate change had been addressed as part of the assumptions; and make recommendations in consultation with the municipalities.”<sup>9</sup> The North East Greenhouse Alliance’s review identified that State Government policies do not consistently address risks from climate change. The State Planning Provisions do not make explicit references to climate change impacts, with the exception of the impact of coastal inundation.<sup>10</sup> This makes it difficult for local governments to apply a consistent approach to addressing the impacts of climate change across Victoria.

### PLANNING SCHEME

The Municipal Strategic Statement (MSS) identifies water security as being a key concern for the municipality. It also identifies flooding as a community risk and labels agriculture and industry as being significant components of the local economy.

The MSS states that the “Benalla Rural City’s planning vision is to provide a proactive planned approach to the issues confronting the municipality”.<sup>11</sup> Climate change is not labelled as an important issue for the municipality, although ‘environmental issues’ are identified. A diverse economy is seen as important to support community sustainability.

Clause 21.07 and clause 21.06 address environment and housing issues respectively. Neither makes any mention of climate change. The environment section refers to a number of environmental risks, many of which are exacerbated by changes in climate. Clause 21.06 on housing is an opportunity for Council to state preferences for sustainable development and resource-friendly housing.

Clause 21.08 identifies the following, among others, as being key issues for economic development:

- Fundamental structural changes within the primary and secondary agricultural industries.
- Reduced viability of some traditional agriculture pursuits.
- Availability of water for major water users.
- Workforce sustainability.

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<sup>9</sup> Martin, N., 2011, *North East Victoria - Adapting to a low water future: Review of municipal documents*, North East Greenhouse Alliance, Wodonga. P12.

<sup>10</sup> Martin, N., 2011, *North East Victoria - Adapting to a low water future: Review of municipal documents*, North East Greenhouse Alliance, Wodonga. P14.

<sup>11</sup> Benalla Rural City Council, 2012, *Benalla Rural City Council Planning Scheme*, <http://planningschemes.dpcd.vic.gov.au/benalla/home.html>. Accessed 30 May 2012. Clause 21.04.

Each of these has been identified during the development of this Climate Change Adaptation Action Plan as being compounded by a changing climate. Clause 21.09 – Infrastructure – also mentions issues that are exacerbated by the effects of climate change, particularly, storm water drainage and the provision of adequate infrastructure for development.

***Recommendations:***

1. Integrate climate change considerations into the MSS as a part of the next review of the Planning Scheme. Explicitly refer to climate change and the threat climate change brings to economic, environmental and social sustainability of the Benalla Rural City within the section on important issues for the municipality. Integrate climate change into clauses 21.06, 21.07, 21.08, and 21.09 by stating how climate change compounds risks that already exist.

**COUNCIL PLAN 2009-2013**

There are many examples within the Council Plan of strategic directions designed to build community, economic or environmental resilience. However there are few references specifically to climate change. The exception is section 1.2.1 – “Plan for and respond to climate change.”<sup>12</sup> This section prescribes working with all sectors of the community to promote understanding of potential impacts of climate change and to mitigate and adapt to impacts. A risk assessment in partnership with other organisations is another activity in this section.

Many other outcomes in the Council Plan touch on issues that climate change will exacerbate, or on solutions that are critical if the challenges of climate change are to be met. The following are examples:

- Outcome 1.3 focusses on community satisfaction with Council services.
- Outcome 2.1 addresses the maintenance of infrastructure according to best practice asset management principles.
- Outcome 2.2 provides for the expansion and diversification of the local economy.
- Outcome 2.3 dictates that Council should maintain its status as financially sustainable.
- Outcome 3.1 calls for a community that is dynamic and resilient.
- Outcome 3.3 mandates that the potential impacts of emergencies are planned for and risks are managed.
- Outcome 3.4 addresses the provision of community infrastructure to meet the needs of the community.
- Outcome 4.1 focusses on sustainable and well-planned land uses and developments.
- Outcome 4.2 has Council established as a key environmental leader.
- Outcome 4.3 discusses the role of Council as an environmental educator in the community
- Outcome 5.1 prescribes partnerships and collaboration to boost community wellbeing.
- Outcome 5.2 also refers to partnerships, specifically with other government agencies.
- Outcome 5.4 discusses integrated planning within the Council.
- Outcome 5.5 calls for effective and open engagement with the community.

***Recommendations:***

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<sup>12</sup> Benalla Rural City Council, 2010, *Council Plan 2009-2013 (2010 Review)*.

2. Climate change impacts the roll-out of a significant portion of the Council Plan and, correspondingly, should be accorded some level of prominence within the Plan. Implementation of the Climate Change Adaptation Action Plan should be mentioned explicitly as an action in the new Council Plan in 2013. Expected climate changes should be mentioned in the 'climate' section of the Council Plan. The Mayor's message, which includes key areas of priority for Council, should include reference to adapting to climate change.

#### **ENVIRONMENT STRATEGY**

The Environment Strategy contains several specific references to climate change, including actions that pertain specifically to dealing with the impacts of climate change and to mitigating carbon emissions. A changing climate is explicitly referred to as a driver of environmental change, and the impacts of climate change in the Goulburn-Broken region are detailed.<sup>13</sup> Federal and Victorian Government climate policies are also included, as are the important regional climate groups – the North East and the Goulburn Broken Greenhouse Alliances.<sup>14</sup>

Of the five strategic directions in the Environment Strategy, "acting to respond and adapt to a changing environment" addresses Council's responsibility to mitigate carbon emissions, provide guidance to the community, and to adapt to the impacts of climate change.<sup>15</sup> The development of this Climate Change Adaptation Action Plan was action 2.3.1.1 of the Environment Strategy.

#### **ECONOMIC DEVELOPMENT STRATEGY**

The Economic Development Strategy is designed to support and strengthen the economic viability of the Benalla Rural City through identifying the strengths and weaknesses of the business sector and, by extension, what Council needs to do to strengthen the economy. Climate change presents considerable risks to a range of businesses. Many of these risks are included in the Strategy, however, there are some sections where the incorporation of climate risks would help to convey the importance of planning to adapt to climate change.

Climate change is included in the Economic Development Strategy in the following areas:

- "Solar and other energy generation" and "green jobs" are listed as emerging industries for the Benalla area.<sup>16</sup>
- Threats from climate, specifically to do with the sustainability of the agricultural sector, are mentioned in the section on potential threats and relative disadvantages.<sup>17</sup>
- Key Direction 3 contains specific reference to supporting agriculturists to adapt to climate change.<sup>18</sup>

#### ***Recommendations:***

3. "Support to address the impacts of a changing climate" should be added to the list on page 9 of economic outcomes sought in the Benalla Rural City.

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<sup>13</sup> Benalla Rural City Council, 2011, *Environment Strategy 2011-2015*, p19.

<sup>14</sup> Benalla Rural City Council, 2011, *Environment Strategy 2011-2015*, pp24-26.

<sup>15</sup> Benalla Rural City Council, 2011, *Environment Strategy 2011-2015*, pp37-40.

<sup>16</sup> Benalla Rural City Council, 2010, *Economic Development Strategy 2010-2013*, p33.

<sup>17</sup> Benalla Rural City Council, 2010, *Economic Development Strategy 2010-2013*, pp46-48.

<sup>18</sup> Benalla Rural City Council, 2010, *Economic Development Strategy 2010-2013*, p62.

4. Discussion of Council’s role in economic development on page 12 should include reference to providing businesses with information on risks to the sustainability of the economy in Benalla. Climate change should be one of those risks.
5. Include a paragraph on threats from climate change to economic development in the ‘potential threats and relative disadvantage’ section on page 46. The paragraph should refer to risks for any business that depends on a constant water supply, that conducts its business outside where heat stress is a threat, or that depends on primary production.
6. Under Key Direction 4, objective “to foster a culture of innovation in the business community”, consider including support for alternative energy production.

#### **MUNICIPAL PUBLIC HEALTH AND WELLBEING PLAN**

The Benalla Rural City *Municipal Public Health and Wellbeing Plan* focusses on planning and management to prevent illness. It recognises a range of factors that affect health, including environmental factors.<sup>19</sup> Changes in climate are not specifically mentioned, however, of note is the provision for a sub-plan addressing heatwaves. Also of note is that climate change and drought are explicitly mentioned as contributing to socioeconomic disadvantage.<sup>20</sup>

The Plan recognises that Council can influence public health through their work in the built, natural, social and economic environments. Again, climate change is not explicitly mentioned, however, there are broad links drawn between the natural environment and public health. Community wellbeing indicators include food security and transport limitations.<sup>21</sup>

The Health and Wellbeing Plan is structured around several Key Result Areas:

- KRA 1: Integrated Health Planning
- KRA 2: Children & Families
- KRA 3: Youth
- KRA 4: Positive Ageing
- KRA 5: Reducing Disadvantage & Building Strong Communities
- KRA 6: Healthy Lifestyles
- KRA 7: Safe, Healthy & Accessible Communities
- KRA 8: Heatwave Adaptation

Several KRAs are related to strengthening the ability of the community to cope with the impacts of a changing climate. KRA 5 speaks of ways to empower the community and overcome disadvantage. KRA 6 includes significant sections on mental health. Neither mention climate change and the relationship between changes in climate and corresponding pressures on people’s livelihoods, which can increase disadvantage and cause problems with mental health. KRA 8 addresses heatwaves and states upfront that climate change research indicates that Benalla is likely to be affected by an increase in heatwaves in the future.<sup>22</sup>

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<sup>19</sup> Benalla Rural City Council, 2009, *Municipal Public Health & Wellbeing Plan 2009 – 2013*, p9.

<sup>20</sup> Benalla Rural City Council, 2009, *Municipal Public Health & Wellbeing Plan 2009 – 2013*, p24.

<sup>21</sup> Benalla Rural City Council, 2009, *Municipal Public Health & Wellbeing Plan 2009 – 2013*, p27.

<sup>22</sup> Benalla Rural City Council, 2009, *Municipal Public Health & Wellbeing Plan 2009 – 2013*, p72.

***Recommendations:***

7. State explicitly in the first ten pages of the Plan that the impacts of climate change are a factor that can affect public health.
8. Consider incorporating the role of climate change in relation to disadvantage in KRA 5 and to mental health in KRA 6.