



DISASTER
MANAGEMENT

ROCKHAMPTON REGION
LOCAL DISASTER
MANAGEMENT GROUP
EMERGENCY RISK MANAGEMENT
ASSESSMENT 2021

emergency.rockhampton.qld.gov.au



FOREWORD

In our Region we are all too familiar with the impact of natural disasters.

As Chair of the Rockhampton Region Local Disaster Management Group I have heard countless stories of loss, but also of our community pulling together to support each other when disaster strikes, whether that's checking in on neighbours or providing a place for friends to stay.

I am very proud of our resilient community. Our experience with natural disasters means we understand that we need to be prepared, and that we can never be complacent.

No natural disaster is ever the same as its predecessor, and recent times have shown that the risks facing our community are changing faster than ever. In order to mitigate and prepare for these changing risks we need to understand them.

The pages that follow contain a clear and up to date assessment of the natural hazards that could impact our community. They detail how exposed we are and the strengths and mitigation strategies that we already have in place.

Importantly, this document shows that those events we typically see as a threat to our community – such as cyclones and flooding – may not be the threats that pose the greatest risks moving forward. Already over the past few years we have seen an

increase in the severity and frequency of bushfires, something we haven't often faced historically, and over the next few years these events are likely to become even more extreme and complex.

As we adapt to new threats, it is more essential than ever that we look to understand precisely the risks we're facing, and what we need to do to prepare. This risk assessment will inform the actions taken at Council as well as by the Rockhampton Region Local Disaster Management Group and emergency services organisations across our Region.

I would encourage everyone in our community to take this information into consideration as they prepare their own households for the risks they may face.

Thank you to all of the stakeholders who participated in this assessment for your valuable contribution, and your continued commitment to developing our Region's disaster resilience.



Mayor Tony Williams

Chair - Rockhampton Region Local Disaster Management Group





UNDERSTAND YOUR RISKS

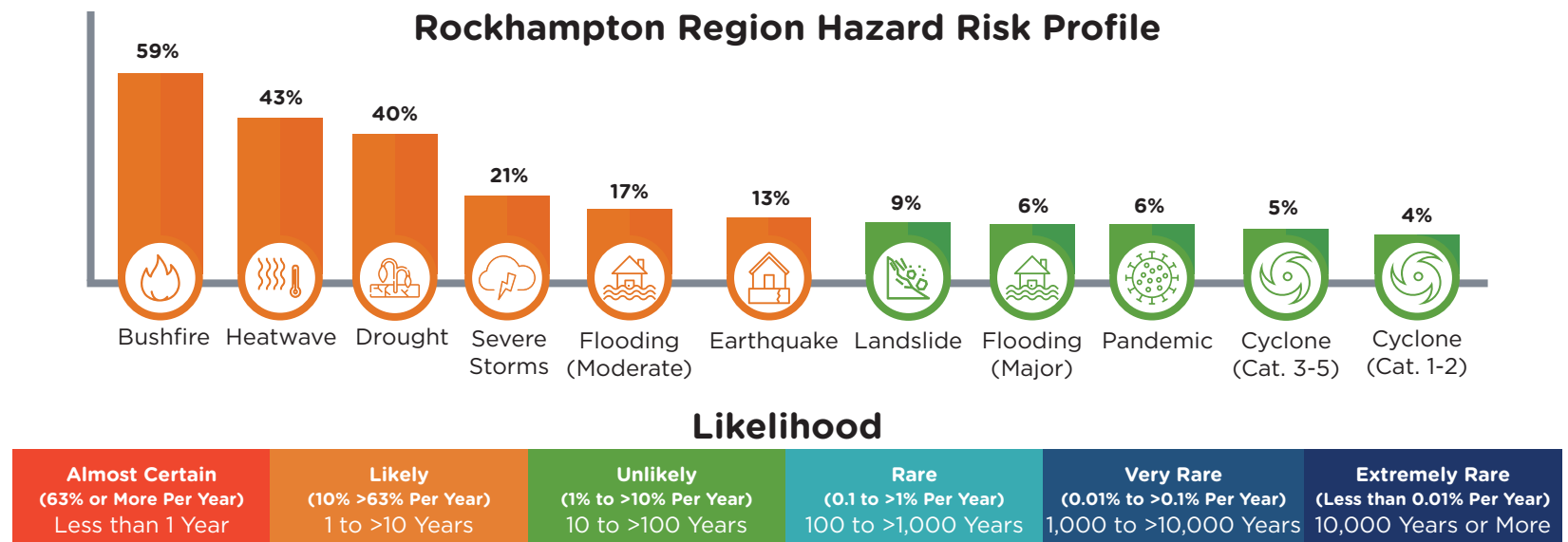
The Rockhampton Region Local Disaster Management Group (LDMG) is committed to ensuring our Region is prepared for any disaster.

A disaster occurs when the impact of a hazard causes serious disruption in a community that requires a significant coordinated response, by the State and other entities, to help the community recover.

The Rockhampton Region LDMG supports and coordinates disaster management activities for the Rockhampton Region. Membership is comprised of the Rockhampton Regional Council Mayor (Chair), Council employees and representatives from local emergency services, government agencies and community groups.

At different times throughout the year the Region is at potential risk from a range of hazards. By undertaking a risk assessment we are able to clearly identify and understand the level of exposure and vulnerability to our community and its assets against these hazards.

The LDMG continues to build upon work previously undertaken¹ and has applied an updated disaster management risk assessment methodology (QERMF²) to the Rockhampton Region. This has resulted in an improved understanding of our local hazards, their likelihood of occurring in a one year period, the vulnerability of exposed elements and ongoing consideration of the effectiveness of mitigation measures in place.



BUSHFIRE

DEFINITION

A bushfire is a fire involving grass, scrub or forest. A bushfire can cause injury, loss of life and/or damage property or the natural environment³.

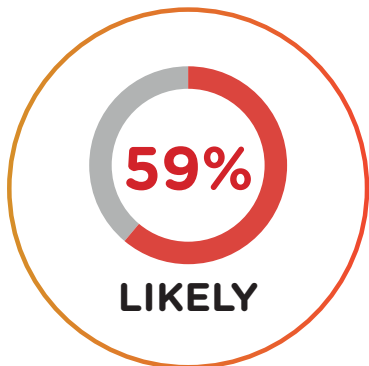
TRENDS

Bushfires across the Region have been increasing in frequency and severity over the past 10 years. The trend of fires burning at higher fire danger ratings, observed during the 2018 Gracemere, Kabra and Stanwell fire which burnt at the catastrophic fire danger level, highlights the bushfire risk to our community.

LIKELIHOOD

This assessment has identified bushfire as being the highest risk to the Rockhampton Region calculated to be 59% Annual Exceedance Probability (AEP). This places bushfire risk at the upper end of the “Likely” category.

The AEP is the probability of a hazard occurring once in a year and is calculated by utilising historical data for the local area.



ROCKHAMPTON REGION STRENGTHS MITIGATION AND PREPAREDNESS

In early 2021 the LDMG completed a comprehensive Bushfire Management Study, Strategy and Mitigation Plan to examine bushfire risk management practices occurring across the Rockhampton Region and identify pathways to manage future risk. As part of this process, Mount Archer and adjacent areas and Mount Morgan and adjacent areas were identified as having the highest bushfire risk in the Region. As a result Bushfire Evacuation Guides have been prepared to assist the LDMG in planning. These guides provide information on evacuation decision making, evacuation options and recommended evacuation routes.

The Rockhampton Area Fire Management Group, coordinated by Queensland Fire and Emergency Services (QFES), meets regularly to continually monitor risk, identify high risk areas and collaborate to plan, implement and report bushfire mitigation activities.

The Rockhampton Region Planning Scheme contains bushfire hazard overlay mapping that provides detailed information on areas of land which have been, or could be, impacted by a bushfire. It also seeks to ensure that new development and redevelopment either avoids, or becomes increasingly resilient to bushfire.

Mitigation strategies such as fire break and trail maintenance, controlled burns, planting of fire resistant species in bushfire prone areas and community education and engagement activities are performed regularly throughout the Region.

POTENTIAL EXPOSURE AND VULNERABILITY IMPACTS



Infrastructure

Stanwell Power Station is located in a bush fire prone area. Damage to Powerlink's lines, substations and communication infrastructure has the potential to disrupt Stanwell Power Station's operations.

To date there have been only minor infrastructure losses as a result of bushfire due to the success of mitigation activities and business continuity plans.



Access and Resupply

Access and resupply issues are limited to (most likely) only hours and days due to the mitigation programs which Council, Department of Transport and Main Roads and Aurizon, assisted by Rural Fire Brigades, implement. As major road networks are primarily located on plains there is a reduced likelihood of trees coming over roads and impacting traffic movements.



Community and Social

Mount Archer and adjacent areas and Mount Morgan and adjacent areas and those in the Fitzroy Northern Area in proximity to Goodedulla National Park are the most vulnerable communities.

There are a number of schools in rural communities located adjacent to bushfire prone land.

A significant portion of the population do not have internet access at their dwellings (Census 2016). This could impact the effectiveness of emergency messaging in the event of a disaster.



Medical

Bushfires pose limited risk to medical facilities while they have sufficient capacity to deal with injury.

RACQ Capricorn Helicopter Rescue Service is a good strategic asset for both evacuation and retrieval of injured persons. Operations are likely to be limited at the extreme and catastrophic levels however due to winds. In other conditions the rescue service has demonstrated the ability for rapid deployment and response.



Significant Industries

During the 2018 Gracemere, Kabra and Stanwell bushfire event, Rockhampton Regional Council staff defended infrastructure and animals at the Rockhampton Zoo from possible ember threat. Council trucks brought water to dampen down what could not be reached by the sprinkler systems.

National Parks and State Forests in the Region are vulnerable to bushfire. There is a direct link between environmental damage and tourism impacts, and places such as Fraser Park, and the walking trails across Mount Archer could see less tourism if ecological systems change due to ongoing fire events.



Environmental

Some plant species are vulnerable to damage or extinction when fires burn at an extreme or catastrophic level. This has already been noted. Following fires the native grass levels across Mount Archer have increased. Long term changes to the vegetation landscape can result from fire events.

HEATWAVE

DEFINITION

A heatwave occurs when the maximum and the minimum temperatures are unusually hotter than average over a three-day period. This is considered in relation to the local climate and past weather at the location⁴.

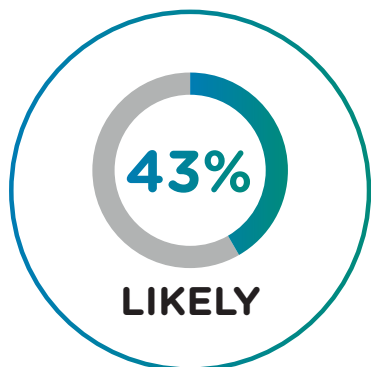
TRENDS

The CSIRO estimates that the Rockhampton Region could experience 29 days over 35 degrees per year in 2030, 37 days per year by 2050 and 70 days per year in 2070⁵.

LIKELIHOOD

Heatwave is the second highest risk to the Rockhampton Region and has been calculated to be 43% Annual Exceedance Probability. This places heatwave risk in the mid-range of the “Likely” category.

The AEP is the probability of a hazard occurring once in a year and is calculated by utilising historical data for the local area.



ROCKHAMPTON REGION STRENGTHS MITIGATION AND PREPAREDNESS

The Local Disaster Management Group has considered Heatwave management in its annual desktop exercise.

Rockhampton Regional Council has developed an Environmental Sustainability Strategy. Events such as National Tree Day and Clean Up Australia Day support the implementation of the Strategy.

The provision of accessible, appropriate and free cool public spaces are important for the wellbeing of many vulnerable people within the community. During the heatwave that occurred post Tropical Cyclone Marcia in 2015, Rockhampton Regional Library opened their doors to provide a cool shelter.

Construction of a solar energy facility at Glenmore Water Treatment Plant to reduce the water treatment plant's reliance on grid supplied electricity and installation of solar powered pathway lights are just two projects undertaken as part of the Sustainable Rockhampton Investment Fund.

The Rockhampton Region Planning Scheme contains urban design principles to improve mitigation of heatwave impacts and general wellbeing.

Rockhampton CBD Streetscape Design Manual is being implemented to deliver street tree planting that will ultimately result in a high quality grid of shaded and attractive streetscapes that connect the key destinations of the CBD and encourage civic life, walking, and cycling.

Council's Tree Management Policy has been developed to provide a consistent approach to planting, maintenance and preservation of trees within the public realm and seeks to plant two trees for every one removed.



POTENTIAL EXPOSURE AND VULNERABILITY IMPACTS



Infrastructure

Higher demand will increase strain on the power network, especially during hot nights. Projected changes in heatwave frequency, duration, and intensity are likely to contribute to further increased demand.

With increased and sustained temperatures there is a higher risk of bacterial contamination within water infrastructure such as reservoirs and bores.



Access and Resupply

Road and rail networks are vulnerable to damage during periods of intense heat. Damage may result in road closures and affect heavy haulage. Service cancellations or delivery delays for rail transport and freight services may result.

People walking and using active transport are more likely to be exposed, and more vulnerable to heat related illness.



Community and Social

Cultural and linguistic barriers may increase vulnerability due to social isolation, limited understanding of heatwave risk, and key messaging.

Exposure of urban populations is compounded by lack of green space, buildings blocking air flow, and the prevalence of heat-absorbing surfaces that release heat slower at night. This exposes people to elevated temperatures for longer.



Medical

Significantly increased mortality rates are likely among vulnerable populations. Vulnerable populations include the elderly, the very young, Aboriginal and Torres Strait Islander communities, people outdoors, people working in hot and/or humid environments, and those with compromised physical and mental wellbeing.



Significant Industries

Sustained high temperatures may reduce crop yield and quality, and affect the productivity, health and wellbeing of livestock.

Vulnerability of ecosystems and impacts to biodiversity may affect tourism. Visitation and enjoyment of attractions and experiences may decline.



Environmental

Higher temperatures may result in increased occurrence of algal blooms and fish kill incidents in freshwater ecosystems. Mass deaths of heat sensitive species and birds may occur, and the risk of extinction for some species may increase.



Solar Powered Pathway Lighting



DROUGHT

DEFINITION

Drought is a prolonged, abnormally dry period when the amount of available water is insufficient to meet our normal use. Because people use water in so many different ways, there is no universal definition of drought. It is measured in different ways and at different timescales⁶.

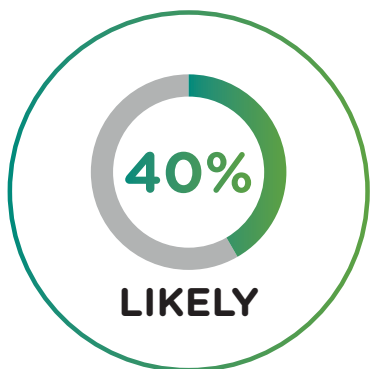
TRENDS

CSIRO and BOM predict that it is likely that eastern parts of the Region will experience more time in drought. The Rockhampton Region has seen 11 drought declarations since 2000.

LIKELIHOOD

Drought is the third highest risk to the Rockhampton Region and has been calculated to be 40% Annual Exceedance Probability (AEP). This places drought risk in the mid-range of the “Likely” category.

The AEP is the probability of a hazard occurring once in a year and is calculated by utilising historical data for the local area.



ROCKHAMPTON REGION STRENGTHS MITIGATION AND PREPAREDNESS

Fitzroy River Water (FRW) has systems and redundancies in place to maintain a continuous water supply for critical infrastructure such as Stanwell Power Station, which is reliant on water. If a continuous water supply to Stanwell is disrupted Stanwell’s capacity could be reduced until the resource recovered.

Council’s Drought Management Plan details restrictions and actions to be implemented during various stages of drought events.

Council has a Water Wise program in place to increase community understanding of the importance of conserving water and using it wisely. Residents who purchase and install water efficient appliances can apply for rebates under the Residential Rebate Scheme for Water Efficient Products Policy.

The Fitzroy River Barrage is the water source for the town of Rockhampton and surrounding areas. If water allocations are drawn from the Barrage storage at the maximum approved amounts, the Barrage will hold sufficient water to supply the Rockhampton area for at least nine months without any run-off into the river over its vast catchment.

The Eden Bann Weir is about 62 km northwest of Rockhampton on the Fitzroy River and was built in 1994 to supply water to Stanwell Power Station.

Rookwood Weir, scheduled for completion in 2023, will deliver up to 76,000 ML per annum to the Region, along with improved water security for Rockhampton, Gladstone and the Capricorn Coast.



POTENTIAL EXPOSURE AND VULNERABILITY IMPACTS



Infrastructure

Drought has less of an effect on infrastructure than other hazards, however it can reduce industry growth. During times of drought and higher temperatures, water consumption from agriculture and communities can increase pressure on infrastructure e.g. pumps at water treatment facilities.

Reduced water availability has flow on effects to fire response capability.



Access and Resupply

Drought has limited impact on access and resupply to the Region. Where appropriate the use of grazing along roadways can be utilised to maintain the rural industries while also reducing bushfire risk.



Community and Social

As populations are projected to increase and changes to the climate are increasing global temperatures and the frequency and magnitude of hot, hotter and extreme temperature days, it is crucial to plan for water demands for average rainfall and drought stricken years.

During periods of drought primary producers may have to reduce stock and crops may fail resulting in some leaving the land.



Medical

Prolonged drought and its impact on generational farmers has seen an increased need for mental health services.



Significant Industries

During drought, agriculture and associated industries need to utilise other means to obtain water. If farmers reduce stock, this can affect the meat processing industry. This may impact economic confidence and investment across the Region.



Environmental

There is a direct link between the environment and tourism. Impacts on environmental assets from drought may reduce tourism.

Droughts, bushfires and heatwaves are already having an impact on local bat colonies.

SEVERE THUNDERSTORM

DEFINITION

Thunderstorms which produce any of the following are classified as severe in Australia:

- large hail (2 cm in diameter or greater);
- damaging wind gusts (90 km/h or greater);
- tornadoes; or
- heavy rainfall conducive to flash flooding⁷.

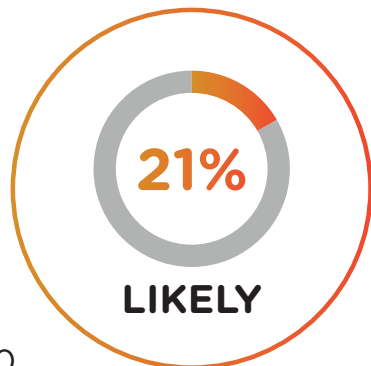
TRENDS

The Rockhampton Region has experienced 24 severe thunderstorms, with significant impacts from hail and flash flooding in the last one hundred years. Predicted increases in storm intensity may result in a higher risk of flooding and inundation throughout the Rockhampton Region.

LIKELIHOOD

Severe thunderstorm is the fourth highest risk to the Rockhampton Region and has been calculated to be 21% Annual Exceedance Probability (AEP). This places severe thunderstorm risk in the lower end of the “Likely” category.

The AEP is the probability of a hazard occurring once in a year and is calculated by utilising historical data for the local area.



ROCKHAMPTON REGION STRENGTHS MITIGATION AND PREPAREDNESS

Stanwell Power Station has little vulnerability to severe thunderstorms. It has power back-up to key systems, and a business continuity plan that is mature and has been tested. Power outages at Stanwell Power Station may not directly impact power supply to Central Queensland, as this region is connected to the National Electricity Market.

Energy Queensland has a response plan which is scalable from local, regional and State levels to reconnect power. The Energy Queensland website provides significant information on outages to the community.

Rockhampton Regional Council has completed improvement works to Pilbeam Drive, Mount Archer. The tree line in areas has been moved back to reduce the impact of severe thunderstorms.

The LDMG undertakes community education under the Get Ready Queensland initiative to advise residents on what actions they can undertake to prepare.

The Rockhampton State Emergency Service (SES) is a sustainable Unit with over 150 members spread across three groups at Rockhampton, Mount Morgan and Gracemere. They have modern equipment and trained personnel to respond to requests for assistance. Through QFES the SES are also able to request additional support from across the Central Region and State if required.



POTENTIAL EXPOSURE AND VULNERABILITY IMPACTS



Infrastructure

Severe thunderstorms have the potential to damage key infrastructure with large hail and high winds. Secondary hazards exist in relation to power outages across the Region. Damage to infrastructure could be severe, and redundancies may be required to host alternate infrastructure for business continuity.



Access and Resupply

Access and resupply issues relate to matters such as trees or power lines over roads. These are likely to be short in duration with the deployment of Council and other agencies to resolve these often localised incidents.

Severe thunderstorms may impact the Rockhampton Airport operations in the short term, however are unlikely to cause significant damage.



Community and Social

Community and social assets can be impacted during severe thunderstorms. Given the age of many of the properties in the Region, there is potential for damage to roofs, windows etc. which may lead to the requirement for short term recovery and displacement of community.



SES Clean Up Crew after Hail Storm



Medical

Most of the medical facilities in the Region are maintained by the State, and there is limited risk of large scale impact on reduction of services due to severe thunderstorms. For localised power outages key health and aged care sites have back up generation to maintain critical services.



Significant Industries

Most significant industries across the Region are resilient to severe thunderstorms. Whilst damage may occur, significant industries are likely to be able to operate under business continuity plans.



Environmental

Severe thunderstorms can produce dry lightning resulting in bushfires, or flash flooding which could impact ecosystems. QFES has mature systems to monitor lightning across the Region and a rapid attack methodology where fires are detected including the use of aircraft once storm conditions subside.



Get Ready Queensland Week



FLOODING (MODERATE)

DEFINITION

Moderate riverine flooding occurs when the Fitzroy River rises to a height greater than 7.5 metres and less than 8.5 metres at the Rockhampton town gauge⁸.

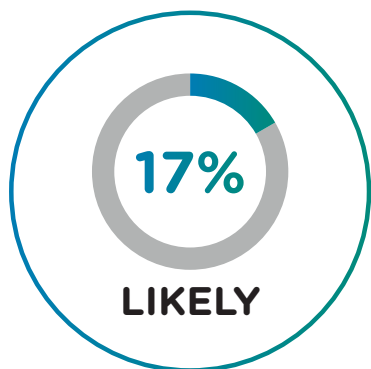
TRENDS

There have been 21 moderate flooding events in 110 years across the Rockhampton Region. Predicted increases in storm intensity may result in a higher risk of flooding and inundation throughout the Rockhampton Region.

LIKELIHOOD

Moderate flooding is the fifth highest risk to the Rockhampton Region and has been calculated to be 17% Annual Exceedance Probability (AEP). This places the risk of moderate flooding at the lower end of the “Likely” category.

The AEP is the probability of a hazard occurring once in a year and is calculated by utilising historical data for the local area.



ROCKHAMPTON REGION STRENGTHS MITIGATION AND PREPAREDNESS

The Yeppen North and Yeppen South Bruce Highway upgrade projects have significantly increased the capacity for connecting Gracemere and Rockhampton, and beyond, during flood.

The Rockhampton SES Unit has the capability to support and resupply to the community through flood boat operations.

Queensland Fire and Emergency Services have Water Rescue response capabilities.

Agencies such as Queensland Police Service have models in place to operate during flood events with stations and staff spread across Rockhampton, Mount Morgan, Gracemere and more remote single officer stations.

The LDMG has a mature approach to flooding and has shown in past events that it has the knowledge and systems in place to respond.

The Rockhampton Region Planning Scheme contains flood hazard overlay mapping that provides detailed information on areas of land within the Rockhampton Region which have been, or could be, impacted by a flood. It also seeks to ensure that new development and redevelopment is not located in flood prone areas.

Council's Flood Management Strategy has been developed to improve community resilience and provide appropriate flood mitigation infrastructure associated with riverine, local creek and overland flooding.

Remote services for those in need of medical attention can be supplied by RACQ Capricorn Helicopter Rescue Service and the State Emergency Service who provide assistance on behalf of Queensland Health and Queensland Ambulance Service.



POTENTIAL EXPOSURE AND VULNERABILITY IMPACTS



Infrastructure

Sewerage facilities may be vulnerable as well as sewerage pumping stations.

Electrical substations and some Telstra exchanges may be isolated due to flood water.



Access and Resupply

Minor and main traffic routes may be closed and low-level bridges submerged.

Rockhampton Airport is vulnerable to flooding. Previous events have resulted in destruction of airside fencing, enabling terrestrial animals to interfere with normal airport operations.



Community and Social

The Fitzroy River flood warning system aims to provide at least three days notice of a flood event above 7 metres at the town gauge. This provides ample warning time for people to evacuate should water levels be forecast to rise to moderate levels. No or limited warning time is available for events on smaller local systems.

Some schools will be affected by flooding at the moderate level.



SES Flood Boat Rescue



Medical

Moderate flooding has minimal impacts on medical infrastructure. The vast majority of medical facilities and services are not located within the flood prone areas. Those that are have mitigation strategies in place to defend from flood waters entering infrastructure.



Significant Industries

In rural areas removal of stock and equipment may be required. Farming located on the floodplains are likely to sustain damage to crops and livestock. Resupply to remote properties may be required.



Environmental

Washouts and debris within waterways can impact the environment through erosion and bank destabilisation.

Bodies of water during flooding events have resulted in mass fish kills as floodwater recedes.



Sandbagging 2017 Floods



EARTHQUAKE

DEFINITION

Earthquakes are the vibrations caused by rocks breaking under stress. The size or magnitude is determined by measuring the amplitude of the seismic waves recorded on a seismograph and the distance of the seismograph from the earthquake⁹.

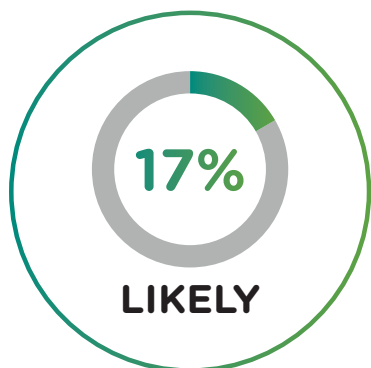
TRENDS

There have been nine seismic events across the Rockhampton Region and surrounding local government areas in the past 63 years.

LIKELIHOOD

The earthquake hazard for the Rockhampton Region has been calculated to be 13% Annual Exceedance Probability (AEP). This places earthquake risk in the lower end of the “Likely” category.

The AEP is the probability of a hazard occurring once in a year and is calculated by utilising historical data for the local area.



ROCKHAMPTON REGION STRENGTHS MITIGATION AND PREPAREDNESS

Agencies such as Department of Transport and Main Roads and Aurizon have mature response and recovery plans in place for all hazards.

There are redundancies for Stanwell Power Station should supply of water and coal be disrupted. The length of time for redundancy is commercial in confidence, however is sufficient.

Queensland Health have redundancy plans which are able to be activated for patient movement if hospitals across the Rockhampton Region are impacted.

The LDMG has a mature Local Disaster Management Plan which could be activated to deal with community impact if there were displaced residents.





POTENTIAL EXPOSURE AND VULNERABILITY IMPACTS



Infrastructure

A computer simulated earthquake (ShakeMap) generated with a local magnitude 5.6, equivalent to the 28 December 1989 event in Newcastle, and applied to the Rockhampton Region, shows that there would only be superficial, if any, damage to infrastructure. There has been no damage to power transmission or gas line infrastructure from previous seismic events.



Access and Resupply

While there is potential to see impacts to major arterials, bridges and other access routes during a major earthquake across the Rockhampton Region, the data does not support the occurrence of such an event. No notable incidents have been recorded for earthquake damage across the major arterial or local road networks from previous seismic events.



Community and Social

There are a number of heritage listed buildings within the Rockhampton Central Business District. While impacts from an earthquake are unlikely to be extensive these older buildings may experience structural damage.



LDMG Exercise 2020



Medical

The only recorded impact on medical facilities was felt in 1918 where hospitals beds were shaken, but no damage occurred. There are redundancies in place with surrounding medical facilities if there was an impact in one part of the Rockhampton Region. Queensland Health have plans which would likely be activated for patient movement if hospitals across the Rockhampton Region were impacted.



Significant Industries

While superficial damage may occur in and around the North Rockhampton area, this is not significant enough to require mitigation or response plans as there would likely be little to no impact on the significant industries across the Rockhampton Region.



Environmental

There is likely to be no environmental damage as a result of earthquakes across the Rockhampton Region.



LDMG Exercise 2019



LANDSLIDE

DEFINITION

Landslides can be caused by a major event such as an earthquake. In Queensland, landslides are generally caused when heavy rain saturates soil on a hillside past the point where vegetation can support the soil's weight against the force of gravity. The top saturated layer of soil then slips down the hill, taking whatever is on the land with it¹⁰.

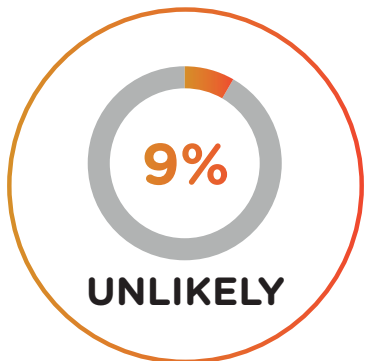
TRENDS

Landslides have not been a major issue for the Rockhampton Region in the past, and have typically been a secondary effect from a primary hazard such as severe thunderstorm or tropical cyclone which have previously impacted the road network to Mount Morgan and Mount Archer.

LIKELIHOOD

The landslide hazard for the Rockhampton Region has been calculated to be 9% Annual Exceedance Probability (AEP). This places landslide risk in the “Unlikely” category.

The AEP is the probability of a hazard occurring once in a year and is calculated by utilising historical data for the local area.



ROCKHAMPTON REGION STRENGTHS MITIGATION AND PREPAREDNESS

Rockhampton Regional Council has adopted a Planning Scheme which is compliant with the State standard. Landslide is considered in the approval for urban and regional planning.

Mitigation work has occurred across the Region to reduce the potential for landslides. Rockhampton Regional Council has completed improvement works to Pilbeam Drive, Mount Archer to reduce the impact from future landslides.



POTENTIAL EXPOSURE AND VULNERABILITY IMPACTS



Infrastructure

In 2013, Tropical Cyclone Oswald caused extensive damage to 2.7 kilometres of the Burnett Highway on the Mount Morgan Range. In 2015, Tropical Cyclone Marcia caused landslides along Pilbeam Drive, the entry point to Mount Archer.

Any infrastructure constructed in proximity to steep land is at risk of being impacted by a landslide.



Access and Resupply

Secondary road networks reduce impacts should a road be closed due to landslide.



Community and Social

There are no anticipated impacts to community and social facilities and functions from landslide.



Medical

There are no anticipated impacts to medical facilities from landslide.



Significant Industries

There are no anticipated impacts to significant industry from landslide.



Environmental

The risk of permanent environmental damage exists where landslide occurs.



FLOODING (MAJOR)

DEFINITION

Major flooding occurs when the Fitzroy River rises to a height greater than 8.5 metres at the Rockhampton town gauge¹¹.

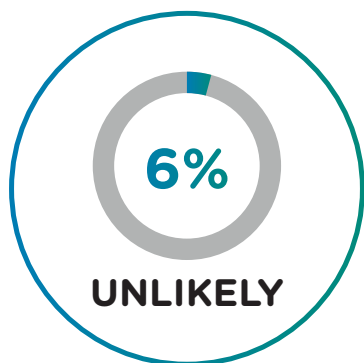
TRENDS

There have been seven major flooding events in the Rockhampton Region over 110 years, with the highest in 1918 reaching 10.1 metres. Predicted increases in storm intensity may result in a higher risk of flooding and inundation throughout the Rockhampton Region.

LIKELIHOOD

The major flooding hazard for the Rockhampton Region has been calculated to be 6% Annual Exceedance Probability (AEP). This places major flooding risk in the “Unlikely” category.

The AEP is the probability of a hazard occurring once in a year and is calculated by utilising historical data for the local area.



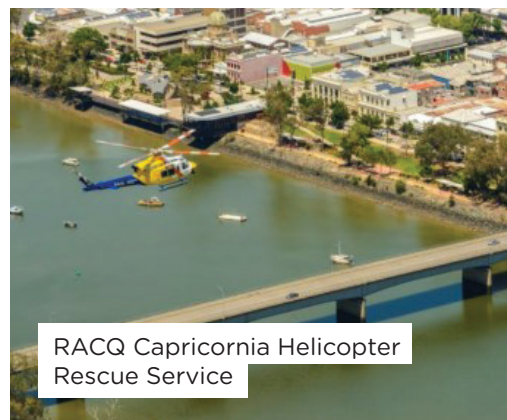
ROCKHAMPTON REGION STRENGTHS MITIGATION AND PREPAREDNESS

Council's Flood Management Strategy has been developed to improve community resilience and provide appropriate flood mitigation infrastructure associated with riverine, local creek and overland flooding.

The North Rockhampton Flood Management Area (NRFMA) improves the flood immunity in the locality of Berserker, North Rockhampton during major flooding.

The Rockhampton Region Strengths, Mitigation and Preparedness measures for major flooding are largely the same as for moderate flooding. Refer to the Flooding (Moderate) risk page for more information.

When major flooding is predicted a temporary flood barrier is constructed at Rockhampton Airport to protect key infrastructure.





POTENTIAL EXPOSURE AND VULNERABILITY IMPACTS



Infrastructure

Infrastructure across the Region will be impacted by water inundation and isolation during a major flood. Recovery times can vary for each event as they rely on the water levels to recede prior to the commencement of clean-up operations. This can have a lasting impact for industry, particularly those under/not insured.



Access and Resupply

It is likely that during a major flood event, some people, communities and assets will be subject to isolation or restricted mobility. This will impact on movement and the capacity to deploy resources. With a small number of strategic land transport corridors into and through the Region, the denial or restricted use of any strategic routes may have a significant impact on accessibility for external support.

The airstrip at the Rockhampton Airport will be inundated during a major flood.



Community and Social

Some schools located on the floodplains will be affected by flooding at the major level.

Evacuation of many houses and business premises may be required.



Medical

The vast majority of medical facilities and services are not located within the flood prone areas and if impacted by a probable maximum flood mitigation strategies are available to defend from flood waters entering infrastructure.

The impact from major flooding would be primarily from the influx of possible casualties from water borne infections/disease or those suffering injury from the flood event.



Significant Industries

Major flooding can impact agricultural land throughout the Rockhampton Region and has done so in recent history. The December 2010/ January 2011 flood event caused widespread disruption to primary producers in the Region and impacted livestock, crops and fencing.

Significant industry impact is similar to that of moderate flooding.



Environmental

Washouts and other debris within waterways can impact the environment through erosion and bank destabilisation.



PANDEMIC

DEFINITION

Pandemics are epidemics on a global scale. For a disease to have pandemic potential it must meet three criteria:

- Humans have little or no pre-existing immunity to the causative pathogen;
- Infection with the pathogen usually leads to disease in humans; and
- The pathogen has the capacity to spread efficiently from person to person¹².

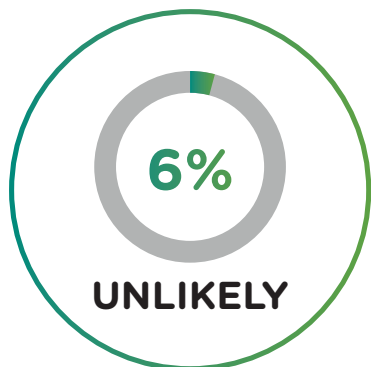
TRENDS

There have been seven pandemics in Australia in the last century. The most significant in recent time, COVID-19.

LIKELIHOOD

The pandemic hazard for the Rockhampton Region has been calculated to be 6% Annual Exceedance Probability (AEP). This places pandemic risk in the “Unlikely” category.

The AEP is the probability of a hazard occurring once in a year and is calculated by utilising historical data for the local area.



ROCKHAMPTON REGION STRENGTHS MITIGATION AND PREPAREDNESS

Rockhampton Regional Council is the provider for all water and wastewater services across the Region. These sites can be operated remotely during a pandemic.

During the COVID-19 pandemic, there was a localised outbreak in the North Rockhampton Nursing Centre. This resulted in a rapid response by Queensland Health, the Rockhampton Region Local Disaster Management Group and District Disaster Management Group.

Agencies involved in front line work have demonstrated good planning in response to COVID-19 to protect their workers with changes to work practices, PPE stores etc. Queensland Fire and Emergency Services deployed a fresh appliance and crew to Blackwater, in neighbouring Central Highlands Regional Council, where there was a suspected outbreak. This allowed the local crew to be isolated and QFES to continue operations and protect the community.



POTENTIAL EXPOSURE AND VULNERABILITY IMPACTS



Infrastructure

Pandemics do not directly impact infrastructure, however can have an impact on the workforce which operate, or maintain them.



Access and Resupply

Pandemics do not directly impact access and resupply however can impact on the workforce which operate, or maintain networks.



Community and Social

The pandemic hazard has a direct impact on people, the community and its social structure. Longer term pandemics have the ability to reduce community resilience through people being directed to isolate during lockdowns. Impacts on the elderly and those who are more vulnerable can be profound.



Medical

Pandemics have the ability to overwhelm medical facilities and those who work in these facilities. Staff are considered highly vulnerable as they have a higher exposure to the virus than the normal population.

Aged care facilities across the Region are especially vulnerable to pandemics given the age and medical conditions of patients within them.



Significant Industries

Pandemics have the potential to slow or stop industry operations as a result of outbreaks. This is largely managed through Public Health Orders by the State.

Vulnerabilities to food or animal processing plants in particular exist during pandemics.



Environmental

Pandemics do not directly impact environmental assets, however can impact on the workforce which seek to maintain them. This has the potential to slow or stop operations such as hazard reduction or other works occurring which can then present a secondary risk to another hazard.

TROPICAL CYCLONE (CATEGORY 3-5)

DEFINITION

Tropical cyclones are low pressure systems that form over warm tropical waters. They typically form when the sea-surface temperature is above 26.5°C. Tropical cyclones can continue for many days, even weeks, and may follow quite erratic paths. A cyclone will dissipate once it moves over land or over cooler oceans.

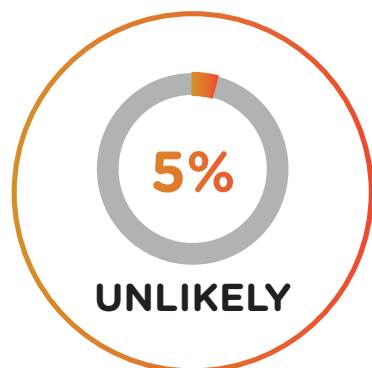
Category 3 cyclones have strongest wind gusts between 165-224 km/hr and can cause some roof and structural damage with power failures likely.

Category 4 cyclones have strongest wind gusts between 225-279 km/hr and can cause significant roofing loss and structural damage and widespread power failures.

Category 5 cyclones have wind gusts greater than 279 km/hr and can be extremely dangerous with widespread destruction¹³.

LIKELIHOOD

The Tropical Cyclone (Category 3-5) hazard for the Rockhampton Region has been calculated to be 5% Annual Exceedance Probability (AEP). This places Tropical Cyclone (Category 3-5) risk in the “Unlikely” category.



The AEP is the probability of a hazard occurring once in a year and is calculated by utilising historical data for the local area.

TRENDS

There have been six Category 3-5 cyclones in the Rockhampton Region over the past 102 years however most rapidly degrade as they cross landfall. An example of this was Tropical Cyclone Marcia in 2015 which passed west of Yeppoon as a Category 4 cyclone, however by the time it reached Rockhampton, on the same day, wind speeds had weakened to those of a high-end Category 2 cyclone.

ROCKHAMPTON REGION STRENGTHS MITIGATION AND PREPAREDNESS

Agencies have a range of deployable resources to manage infrastructure that is impacted.

NBN demonstrated they have the ability to move mobile satellite equipment into affected areas until permanent infrastructure is reinstated.

The LDMG has a mature Local Disaster Management Plan (LDMP) and the SES, Queensland Fire and Emergency Services, Queensland Police Service and Energy Queensland have the ability to respond during and after a cyclone.

The LDMG provides education to residents through the Get Ready Queensland program and the use of Council's Disaster Management community engagement and education trailer at various events.

Where evacuation is required, this is well planned and strategies are documented within the LDMP and Evacuation Sub Plan.



POTENTIAL EXPOSURE AND VULNERABILITY IMPACTS



Infrastructure

Damage to Powerlink's lines, substations and communications infrastructure has the potential to isolate or render inoperable sections of the national electricity grid and the market it supports (supplies Queensland's distribution network including heavy industry). Loss of the national grid would mean loss of power for every user that does not have remote generation capacity.

Aurizon's coal trains would be affected by an outage as there are several lines that supply the electrified rail network.



Access and Resupply

Access routes are likely to be impacted from fallen trees and power lines. Alternate routes for transport have been determined in past events. Flow on effects should be considered with access issues during events. For example if Lakes Creek Road is closed this may have an impact on access to the landfill.



Community and Social

As a result of Tropical Cyclone Marcia many homes were left without power in the Rockhampton Region. Almost 800 people requested assistance from the SES.



Medical

Back up generation is available in Queensland Health facilities and where required has worked well.

Local hospitals have demonstrated the capacity to respond effectively during and after cyclones.



Significant Industries

Significant industries are likely to be impacted by power loss resulting from Category 3-5 cyclones across the Rockhampton Region. Deployment of fuelling strategies by industry should be considered and strengthened within business continuity plans. The LDMG may be requested to assist with refuelling support.



Environmental

Environmental damage can occur during these events with secondary hazards of heavy rain and additional debris in waterways etc. having impacts.



TROPICAL CYCLONE (CATEGORY 1-2)

DEFINITION

Tropical cyclones are low pressure systems that form over warm tropical waters. They typically form when the sea-surface temperature is above 26.5°C. Tropical cyclones can continue for many days, even weeks, and may follow quite erratic paths. A cyclone will dissipate once it moves over land or over cooler oceans.

Category 1 cyclones have strongest wind gusts up to 125 km/hr and can cause minimal property damage.

Category 2 cyclones have strongest wind gusts of between 125-164 km/hr and can cause minor property damage and the risk of power failure¹⁴.

TRENDS

There have been five Tropical Cyclones (Category 1-2) in the past 102 years across the Rockhampton Region. The worst cyclone the Region has experienced was in 1949 (unnamed Cyclone). This cyclone was at the higher end of Category 2 and produced winds of 160 km/hr and caused significant damage across the Region.

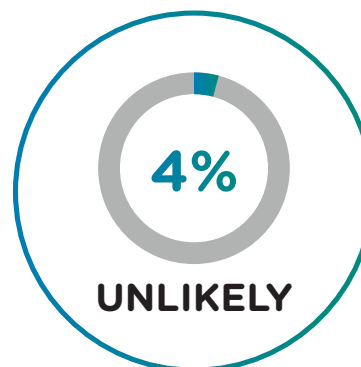
LIKELIHOOD

The Tropical Cyclone (Category 1-2) hazard for the Rockhampton Region has been calculated to be 4% Annual Exceedance Probability (AEP). This places Tropical Cyclone (Category 1-2) risk in the “Unlikely” category.

The AEP is the probability of a hazard occurring once in a year and is calculated by utilising historical data for the local area.

ROCKHAMPTON REGION STRENGTHS MITIGATION AND PREPAREDNESS

The Rockhampton Region Strengths, Mitigation and Preparedness measures for Tropical Cyclones (Category 1-2) are largely the same as for Tropical Cyclones (Category 3-5). Refer to the Tropical Cyclone (Category 3-5) risk page for more information.





POTENTIAL EXPOSURE AND VULNERABILITY IMPACTS



Infrastructure

During previous events damage has been limited, able to be repaired, and re-building was not required.



Access and Resupply

Local roads are likely to be impacted by fallen trees and power lines. Response arrangements are in place. Council and agencies are supported by the LDMG.



Community and Social

There is potential for some locations throughout the Rockhampton Region to be isolated from the wider community as a result of flooding and damage from cyclones.



Medical

Back up generation is available in Queensland Health facilities and where required has worked well. Local hospitals have demonstrated the capacity to respond effectively during and after cyclones.



Significant Industries

Significant industries could be impacted by power loss that results from Category 1-2 cyclones across the Rockhampton Region.

Deployment of fuelling strategies by industry should be considered and strengthened with business continuity plans. The LDMG may be requested to assist with refuelling support.



Environmental

Environmental damage can occur during these events with secondary hazards of heavy rain and additional debris in waterways etc. having impacts.

READY RESPOND RECOVER

A good understanding of hazards is vital to minimising their potential impact and increasing resilience in the Rockhampton Region. Recent experiences throughout Australia, and predicted increases in the frequency and intensity of hazards, makes this knowledge more important than ever.

Disaster Resilience is the capacity of communities to prepare for, absorb and recover from natural hazard events, and the capacities of communities to learn, adapt and transform towards resilience¹⁵.

There are potential exposure and vulnerability impacts to the community and its assets from hazards that may affect the Rockhampton Region.

The LDMG has utilised this information to consider current mitigation measures and build on these where any potential strategies have been identified.

YOUR EMERGENCY GUIDE

Understanding the risks and hazards that may affect you, your household, family and business enables you to take appropriate steps to prepare for a disaster.

STEP 1 UNDERSTAND YOUR RISKS

It's only when you understand your risks that you are able to take the necessary steps to reduce the impact of a disaster. This assessment has been developed specifically for this purpose.

STEP 2 MAKE A PLAN

Preparing a Household Emergency and Evacuation Plan will ensure that everyone in your household knows exactly what to do if a disaster occurs. You might want to involve your neighbours in developing your plan - neighbours who are elderly or have special needs may need your assistance. Equally, neighbours may also provide assistance to your household if required.

STEP 3 PACK SUPPLIES

As a result of a disaster you may be unable to leave your home for an extended period of time. Be prepared by having an Emergency Kit stocked and ready for this type of situation.

There may also be times during an emergency where it becomes unsafe for your household to stay at home and you need to evacuate. In addition to your Emergency Kit you need to pack an Evacuation Kit - one for each member of the household.

STEP 4 PREPARE YOUR HOME

There is no better time than now to get your home prepared so you are ready when the next disaster hits. The best place to start is home maintenance. Keeping your garden maintained and looking out for any damage to your home as a result of age or a previous incident will ensure your home is in the best shape it can be for any future disaster.

STEP 5 PROTECT YOUR PET

It is important to consider what will happen to your pet in the event of a disaster. This means thinking about what plans you can put in place now to make sure your pet is cared for if you were unable to get home, or what you would do with your pet if you had to evacuate.

For more information head to Rockhampton Regional Council's Emergency Dashboard at emergency.rockhampton.qld.gov.au



Bushfire Safety Meeting



Volunteer Organisations Active in Disaster



Disability Inclusive Disaster Risk Reduction



Engaging with community



Mount Morgan Bushfire Mitigation

REFERENCES

- ¹ RRC Natural Hazard Risk Assessment 2012
- ² Queensland Emergency Risk Management Framework (QERMF) - <https://www.disaster.qld.gov.au/dmg/Prevention/Pages/3-5.aspx>
- ³ Queensland Bushfire Plan
- ⁴ Bureau of Meteorology - <http://www.bom.gov.au/australia/heatwave/knowledge-centre/understanding.shtml>
- ⁵ The Australian Institute - http://australiainstitute.org.au/wp-content/uploads/2020/12/P597-Rockhampton-Heatwatch-WEB_0.pdf
- ⁶ Bureau of Meteorology - <http://www.bom.gov.au/climate/drought/knowledge-centre/understanding.shtml>
- ⁷ Bureau of Meteorology - <http://www.bom.gov.au/weather-services/severe-weather-knowledge-centre/severethunder.shtml>
- ⁸ Bureau of Meteorology - <http://www.bom.gov.au/qld/flood/brochures/fitzroy/fitzroy.shtml>
- ⁹ Geoscience Australia - <https://www.ga.gov.au/scientific-topics/community-safety/earthquake>
- ¹⁰ Queensland Government, Get Ready Queensland - <https://www.getready.qld.gov.au/understand-your-risk/types-natural-disasters/landslide>
- ¹¹ Bureau of Meteorology - <http://www.bom.gov.au/qld/flood/brochures/fitzroy/fitzroy.shtml>
- ¹² Queensland Government - https://www.qld.gov.au/data/assets/pdf_file/0025/124585/FINAL-QLD-WoG-Pandemic-Plan.pdf
- ¹³ Bureau of Meteorology - <http://www.bom.gov.au/cyclone/tropical-cyclone-knowledge-centre/understanding/tc-info/>
- ¹⁴ Bureau of Meteorology - <http://www.bom.gov.au/cyclone/tropical-cyclone-knowledge-centre/understanding/tc-info/>
- ¹⁵ Australian Institute for Disaster Resilience - <https://knowledge.aidr.org.au/resources/ajem-apr-2017-the-australian-natural-disaster-resilience-index/>

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