



CORE INFRASTRUCTURE RISK MANAGEMENT PLAN

Sewer

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1. INTRODUCTION

1.1 Aim

The purpose of this core infrastructure risk management plan is to document the results and recommendations resulting from periodic identification, assessment and treatment of risks associated with providing services to the community from infrastructure, in accordance with the Berrigan Shire Council's Risk Management Policy and Framework.

1.2 Objectives

The objectives of the plan are:

- to identify risks to the Berrigan Shire Council that may impact of the delivery of services from infrastructure
- to select credible risks for detailed analysis,
- to analyse and evaluate risks in accordance with Council Policy,
- to prioritise risks,
- to identify risks requiring treatment by management action,
- to develop risk treatment plans identifying the tasks required to manage the risks, the person responsible for each task, the resources required and the due completion date.

1.3 Core and Advanced Risk Management

This core risk management plan has been designed to be read as a supporting document to the infrastructure and asset management plan. It has been prepared in accordance with the Berrigan Shire Council's Risk Management Policy and Framework.

1.4 Scope

This plan considers risks associated with the delivery of services from infrastructure.

1.5 The Risk Management Context

Council has implemented varied management practices and procedures to control risks associated with providing services from infrastructure assets. These include:

- operating a reactive maintenance service for all assets and services;
- operating a planned maintenance system for key assets;
- monitoring condition and remaining service life of assets nearing the end of their service life;
- renewing and upgrading assets to maintain service delivery;
- closing and disposing of assets not providing the required service level; and
- acquiring or constructing new assets to provide new and improved services.

Council has assigned responsibilities for managing risks associated with sewer assets and service delivery to its Technical Services Department.

1.6 Risk Management Framework

The risk management process used in this project is shown in Fig 1.6 below.

This process is based on AS/NZS ISO 31000 2009 Risk Management - Principles and guidelines, and provides a template to ensure a consistent and comprehensive approach to risk management across all functions of Council.

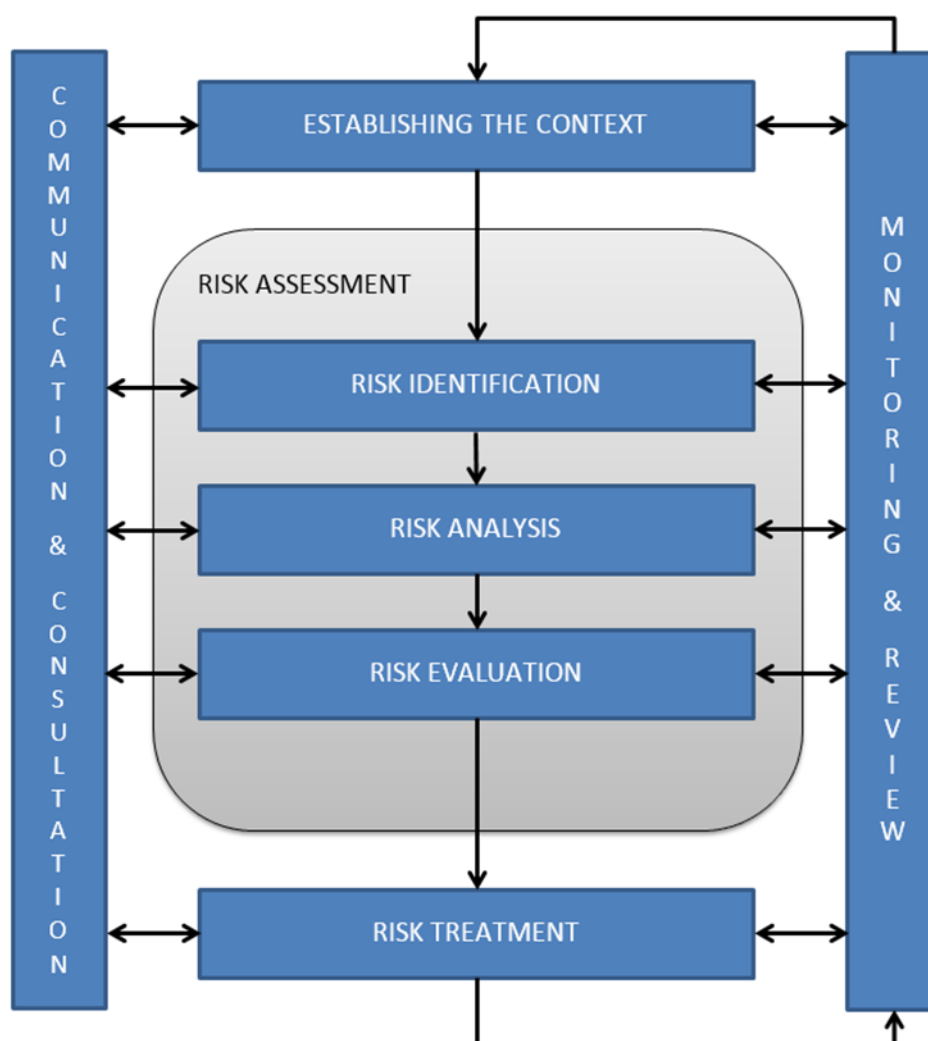


Figure 1.6

2. COMMUNICATION AND CONSULTATION

In accordance with legislation and best practice, Berrigan Shire Council uses a variety of internal forums to consult and communicate with staff and other stakeholders.

In terms of risk management, Council's consultation aims are to:

- Improve people's understanding of risks and the risk management processes;
- Ensure that the varied views of stakeholders are considered; and
- Ensure that all participants are aware of their roles and responsibilities.

The development of this infrastructure risk management plan was undertaken using a consultative team approach to:-

- Identify stakeholders and specialist advisors who need to be involved in the risk management process;
- Discuss and take into account the views of stakeholder and specialist advisors; and
- Communicate the results of the risk management process to ensure that all stakeholders are aware of and understand their roles and responsibilities in risk treatment plans.

Members of the team responsible for preparation of this risk management plan are:

- Fred Exton – Director Technical Services
- Myles Humphries – Environmental Engineer
- Garry Graham – Technical Officer Water and Sewer
- Michelle Koopman – Enterprise Risk Manager
- Paul Glanvill – Technical Officer Asset Management
- Carla von Brockhusen – Finance Manager
- Matthew Clarke – Engineering Services Manager

3. RISK IDENTIFICATION

3.1 General

Potential risks associated with providing services from infrastructure were identified at meetings of the council's infrastructure risk management team.

Team members were asked to identify "What can happen, where and when" to the various council services and then to identify possible "Why and how can it happen" as causes for each potential event.

Each risk was then tested for credibility to ensure that available resources were applied to those risks that the team considered were necessary to proceed with detailed risk analysis.

The assets at risk, what can happen, when, possible cause(s), existing controls and credibility are shown in Appendix A – Risk Register.

Credible risks are subjected to risk analysis in Section 4.4.5. Risks assessed as non-credible were not considered further and will be managed by routine procedures.

4. RISK ANALYSIS

4.1 General

Credible risks which have been identified during the risk identification stage were analysed. This process using the Council's Risk Management Framework, takes into account the '**likelihood**' and the '**consequences**' of the event. The objective of the analysis is prioritise risks by separating low and acceptable risks from the high risks, and to provide data to assist in the assessment and management of risks.

The risk analysis process using Council's Risk Management Framework is applied to all credible risks to determine levels of risk. The process acts as a filter by applying a reasoned and consistent process. Low risks are identified as "tolerable risk", and can be removed from further consideration and managed using existing processes.

The remaining risks will therefore be of such significance as to consider the development of risk treatment options and plans.

4.2 Likelihood

Likelihood is a qualitative description of probability of an event occurring. The process of determining likelihood involves combining information about estimated or calculated probability, history or experience. Where possible it is based on past records, relevant experience, industry practice and experience, published literature or expert judgement.

4.3 Consequences

Consequences are a qualitative description of the effect of the event. The process of determining consequences involved combining information about estimated or calculated effects, history and experience.

4.4.1 Likelihood

Level	Descriptor	Description	Indicative Frequency
A	Almost Certain	The event will occur on an annual basis.	Expected to occur.
B	Likely	The event has occurred several times or more in your career.	Will probably occur.
C	Possible	The event might occur once in your career.	Might occur at some time.
D	Unlikely	Heard of something like this occurring.	Not likely to occur.
E	Rare	Have never heard of this happening.	Conceivable but highly unlikely.

4.4.2 Consequences

Consequences	Description
1	<ul style="list-style-type: none">• Minor injury not requiring medical treatment;• Negligible financial loss (less than \$10,000);• Minimal environmental impact, isolated release only.
2	<ul style="list-style-type: none">• Minor injury requiring medical treatment or first aid;• Minor financial loss (\$10,000 - \$50,000);• Minor environmental impact, on-site release controlled.
3	<ul style="list-style-type: none">• Objective but reversible disability requiring hospitalisation;• Significant financial loss (\$50,000 - \$200,000);• Significant environmental impact –assistance required to contain.
4	<ul style="list-style-type: none">• Moderate irreversible disability or impairment;• Major financial loss (\$200,000 - \$1,000,000);• Major environmental impact, release spreading off-site
5	<ul style="list-style-type: none">• Single fatality and/or severe irreversible disability;• Extensive financial loss (more than \$1M);• Fatalities occur, extensive release off-site

4.4.3

Risk Assessment

The risk assessment process compares the likelihood of a risk event occurring against the consequences of the event occurring. In the risk matrix below, a risk event with a likelihood of 'Possible' and a consequence assessed at '3' has a risk rating of 'High'. This rating is used to develop a typical risk treatment outlined in Section 5.3.

Likelihood	Descriptor	Consequence				
		1	2	3	4	5
A	Almost Certain	Medium	High	High	Very High	Very High
B	Likely	Medium	Medium	High	High	Very High
C	Possible	Low	Medium	High	High	High
D	Unlikely	Low	Low	Medium	Medium	High
E	Rare	Low	Low	Medium	Medium	High

4.4.4 Risk Response

The risk rating is used to determine risk treatments. Risk treatments can range from immediate corrective action (such as stop work or prevent use of the asset) for 'Very High' risks, or to manage by routine procedures for 'Low' risks.

An event with a 'High Risk' rating will require a management response and an action plan. This may include actions such as reducing the likelihood of the event occurring by physical methods (limiting usage to within the asset's capacity, increasing monitoring and maintenance practices, etc.), reducing consequences (limiting speed of use, preparing response plans, etc.) and/or sharing the risk with others (insuring the organisation against the risk).

	Response	Action
Very High	Senior management attention required. Action plan required.	Immediate response Specify management responsibility
High	Senior management attention Action plan required	Response required within 7 working days Specify management responsibility
Medium	Implement specific monitoring or response procedures	Heightened action Specify management responsibility
Low	Manage by routine procedures. Unlikely to require a specific application of resources	Business as usual Response may not be necessary

4.4.5 Risk Analysis

The team conducted an analysis of credible risks identified in section 3.1 using the method described above to determine a risk rating for each credible risk.

The credible risks and risk ratings are shown in Appendix A – Risk Register

4.5 Risk Evaluation

The purpose of risk evaluation is to make decisions about which risks need treatment and treatment priorities, based on the results of the analysis.

The risk management team evaluated the need for risk treatment plans using an overall assessment of the following evaluation questions to answer “is the risk acceptable?”

• What current systems may prevent, detect or lower the consequences or likelihoods of undesirable risks or events?
• What are the consequences or range of consequences of the risks if they do occur?
• What is the likelihood or range of likelihoods of the risks happening?
• What factors might increase or decrease the likelihoods or the consequences?
• What factors might increase or decrease the likelihoods or the consequences?
• What additional factors may need to be considered?
• What are the limitations of the analysis and assumptions made?
• How confident are you in your judgement or research specifically in relation to the high consequence and low likelihood risks?
• Is the logic behind the analysis sound?
• What current systems may enhance or increase the consequences or likelihoods of opportunities or beneficial events?

The evaluation criteria are to provide guidance to evaluate whether the risks are acceptable to the Council and its stakeholders in providing services to the community. Risks that do not meet the evaluation criteria above are deemed to be unacceptable and risk treatment plans are required to be developed and documented in this Infrastructure Risk Management Plan.

5. RISK TREATMENT PLANS

5.1 General

Council uses the ALARP (“As Low as Reasonably Practicable”) technique in determining which risks will be treated through an evaluation of “tolerable risk”. ALARP enlists the concept of what is “reasonably practicable” by evaluating if something can be done against the costs and benefits of action or inaction. These two aspects need to be balanced carefully if the risk being treated is related to an expressed or implied duty of care.

The treatment of risk involves identifying the range of options for treating risk, evaluating those options, preparing risk treatment plans and implementing those plans. This includes reviewing existing guides for treating that particular risk, such as Australian and State legislation and regulations, Australian Standards and Best Practice Guides.

Developing risk treatment options starts with understanding how risks arise, understanding the immediate causes and the underlying factors that influence whether the proposed treatment will be effective.

One treatment option is to eliminate the risk completely by discontinuing the provision of the service. Other options include risk reduction by reducing the likelihood and/or the consequences of the risk.

5.2 Risk Treatment Process

The risk treatment process comprises the following five steps.

Step 1. Review causes and controls

The risk identification process documented in Section 3 included identifying possible causes and documenting existing controls.

Step 2. Develop treatment options

Treatment options include those that eliminate risk, reduce the likelihood or the risk event occurring, reducing the consequences should the risk event occur, sharing of the risk with others and accepting the risk.

Step 3. Assess risk treatment options against costs and residual risk

The method of assessment of risk treatment options can range from an assessment by a local group of stakeholders and practitioners experienced in operation and management of the assets/service to detailed risk cost and risk reduction cost/benefit analysis.

Step 4. Select optimum risk treatment

Step 5. Develop risk treatment plans

5.3 Risk Treatments

The risk treatments identified for non-acceptable risks are detailed in Appendix A – Risk Register.

5.4 Risk Treatment Plans

From each of the risk treatments identified in Appendix A – Risk Register, risk treatment plans were developed.

The risk treatment plans identify for each non-acceptable risk:-

1. Proposed action
2. Responsibility
3. Resource requirement/budget
4. Timing
5. Reporting and monitoring required

The risk treatment plan is shown in Appendix A – Risk Register.

6. MONITORING AND REVIEW

The plan will be monitored and reviewed as follows.

Activity	Review Process
Review of new risks and changes to existing risks	Annual review by team with stakeholders and report to council
Review of Risk Management Plan	3 yearly review and re-write by team and report to council
Performance review of Risk Treatment Plan	Action plan tasks incorporated in council staff performance criteria with 6 monthly performance review. Action plan tasks for other organisations reviewed at annual team review meeting

7. REFERENCES

AS/NZS ISO 31000:2009 Risk Management – Principles and guidelines

Berrigan Shire Council, Risk Management Policy and Framework, adopted 15th March, 2017

International Infrastructure Management Manual, 2015, Institute of Public ~Works Engineering Australia, Sydney, 2006 www.ipwea.org.au

APPENDIX A RISK REGISTER

BERRIGAN SHIRE COUNCIL – SEWER - INFRASTRUCTURE RISK REGISTER																			
RISK IDENTIFICATION							RISK ANALYSIS					RISK TREATMENT			RISK TREATMENT PLAN				
Risk No.	Asset at Risk	What can happen?	When can it occur?	Possible cause	Existing controls	Is risk credible?	Likelihood	Consequences	Risk rating	Action required	Is risk acceptable?	Treatment option(s)	Residual risk	Risk treatment plan	Actions	Responsibility	Resources	Budget	Due
1	Sewer Treatment Plants	Overflow to environment or reduction to water treatment due to power failure	Anytime now	Mains power failure	Bypass arrangements and pond system to buffer water quality	Yes	Likely	Minor	Medium	Planned action required	Yes								
2	Sewer Treatment Plants	Overflow to environment or reduction to water treatment due to component failure	Anytime now	Failure of mechanical/electrical components of pumps	Scheduled inspection of plant components and completion of required maintenance	Yes	Possible	Minor	Medium	Planned action required	Yes								
3	Sewer Treatment Plants	Reduction to water treatment due to structural deficiency of concrete components	Anytime now	Failure of concrete components due to corrosion or ground movement	Scheduled inspection of plant structural components and completion of required repairs OR replacement	Yes	Possible	Moderate	Medium	Planned action required	No	Carry out scheduled inspections of concrete components and program replacement / refurbishment of faulty components	Risk will remain until sufficient resources to inspect all plants and complete required repairs	Carry out visual inspections of all sewer plants and repair all structural defects	14.1 Arrange for visual inspections of sewer plant components 14.2 Record and document all inspections and attach to BizeAssets 14.3 Prioritize structural defects and budget for repair 14.4 Repair structural defects	EE	Council Staff and Contractors	14.1 - 14.3 \$30,000 14.4 - Unknown Allow \$100,000/ann for 3 years	14.1 - 14.3 Jun 2018 14.4 Jun 2020

4	Sewer Mains	Overflow to environment due to sewer blockage, Illegal connection of stormwater	Anytime now	Blockage by tree roots or other foreign objects	Incident response and repair	Yes	Likely	Minor	Medium	Planned action required	Yes								
5	Effluent Ponds	Overtopping of ponds	Within 2-3 years	Exceptionally wet season	Monitoring of pond levels and transfer of water	Yes	Unlikely	Moderate	Medium	Planned action required	Yes								
6	Sewer Pump Stations	Overflow to environment due to power failure	Anytime now	Mains power failure	Critical Pump Stations have Generator Connections, and minimum 6 hr storage	Yes	Possible	Minor	Medium	Planned action required	Yes								
7	Sewer Pump Stations	Overflow to environment due to pump failure	Anytime now	Failure of mechanical/electrical components of pumps	Scheduled inspection of pumps and completion of required maintenance/back up pumps available	Yes	Possible	Minor	Medium	Planned action required	Yes								
8	Tocumwal Recycle Pond	Overtopping of ponds	Within 2-3 years	Extended wet conditions	Monitoring of pond levels and transfer of water	Yes	Unlikely	Minor	Low	Manage by routine procedures	Yes								
9	Tocumwal & Finley Golf Courses, Berrigan Race Track	Poor quality effluent delivered for reuse system	Anytime in the future	Failure of chlorination system	Scheduled inspection of chlorination unit and maintenance of unit and monitoring and changing of gas bottles	Yes	Possible	Major	High	Prioritised action required	No	Review of current Operational Environmental Management Plans to ensure best practise controls in place for exposure to effluent	Risk can be controlled but not eliminated	Revision of OEMP's for all sites that receive treated effluent for reuse	12.1 Revise OEMP's 12.2 Redistribute updated OEMP's including response activities and controls	EE	Council Staff Responsible staff from venues receiving recycled effluent	\$5,000/annum/plant for review of operational activities required to manage re-use	Jun-18
10	Effluent Quality	Ingress of stormwater into system	Anytime now	Inclement weather combined with illegal connections and poor maintenance	Scheduled inspection of reticulation and repairs. Inspection of new building connections. Smoke testing of manholes and lines	Yes	Likely	Minor	Medium	Planned action required	Yes								

11	Reticulation System	Collapse of pipes or manholes	Anytime in the future	Erosion of pipes and structures due to age and corrosive nature of sewerage	Reactive maintenance	Yes	Possible	Moderate	High	Prioritised action required	No	Carry out internal inspections of pipes and manholes and program replacement / refurbishment of faulty components	Risk will remain until sufficient resources to inspect all retic and complete required repairs	Carry out CCTV inspections of all sewer retic and repair all structural defects	14.1 Arrange for CCTV inspections of sewer retic. 14.2 Record and document all inspections and attach to BizeAssets 14.3 Prioritize structural defects and budget for repair 14.4 Repair structural defects	EE	Council Staff and Contractors	14.1 - 14.3 \$40,000 annually 14.4 - Unknown Allow \$150,000/ann for 5 years	14.1 - 14.3 Jun 2018 14.4 Jun 2022
12	Reticulation System	Illegal Discharge of flammable materials	Anytime now	Illegal connections or discharges by person unknown	Routine inspection, compliance and enforcement	Yes	Unlikely	Catastrophic	High	Prioritised action required	Yes								