

4.0 Risk Management

4.1 Introduction

Risk Management intends to find a balance between realising opportunities for gain while minimising losses (*AS/NZS 4360:2004 Risk Management*). It is a process that considers the following stages:

- Risk management context – determining the framework within which area wide risks will be managed.
- Risk identification – identifying the relevant risks.
- Risk analysis – scoring or rating each of the risks identified in a way that makes them comparable across the organisation.
- Risk treatment – identify the actions to be taken.
- Monitor and review the risks to ensure mitigation is successful and identify new risks.

The linkages between the different stages are illustrated in Figure 5.

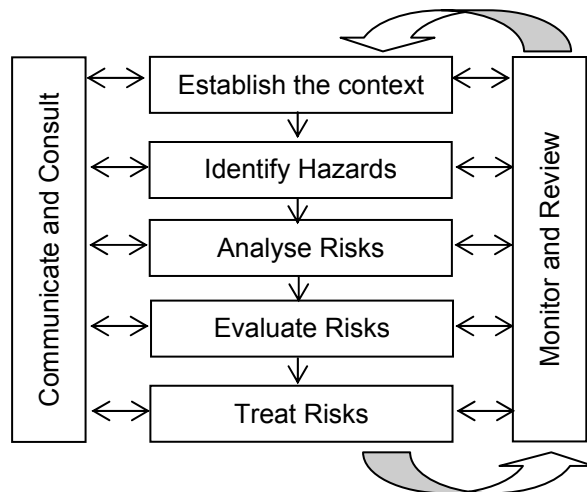


Figure 5 – Risk Management Process

Source: NZS 4360 Risk Management

In 2008 SDC began to develop an integrated risk management (IRM) framework to interface with the LTCCP, activity/asset/business management plans, and other operational planning requirements. The key output from this project is to ensure optimal management of risks, treatment strategies and allocation of resources where they will have the most beneficial affect on organisational success. In addition to the development of a corporate risk register the activity based register is still required to be reviewed and updated to incorporate new definitions for consequence and probability.

Building on the consequence and probability definitions of 2005 AM Plan the IRM project developed a much more comprehensive set of criteria and scores following intensive workshops with IRM project team.

4.1.1 Integrated Risk Management Project

The project is being lead by Chief Information Officer at SDC supported by a project team representing all groups of council and facilitated by MWH. The adopted IRM approach consists of three phases:

- Phase 1 - Development & deployment of the IRM process and framework
 - Compare risks across all activities.
 - Integrate with the LTCCP process (manually).

- Assist staff with identifying risks that will be used to develop community outcomes within the next LTCCP.
- Assess the impact on sustainability - (Economic and Environmental).
- Consultant independent - owned by Council internally and understood by Council.
- Phase 2 - Automation of the process and framework
 - Application developed to hold this information providing management of the activities and risks and electronic integration with other Council systems.
 - Provide modelling for future risk analysis and the impact these have on other activities
 - Provide full organisation risk profile and associated weighting.
- Phase 3 - Integration with capital development, maintenance and renewal programmes.
 - Alternative funding allocation mechanism for internal projects based on risk profile.
 - Interface between organisational and activity views.
 - Linking of funding to possible successes.

The project is currently in Phase 1 with Phases 2 & 3 expected to be complete during 2009.

4.1.2 Activity Risk Management

Complimenting the IRM project discussed above is the activity level risk assessments. These follow the same framework but focus more on activity specific risks rather than organisational risks.

4.2 Context (Prepared by MWH)

Southland District Council has adopted an Integrated Risk Management (IRM) framework and process as the means for managing risk within the organisation. This section provides the background and description of the process and framework.

The IRM process and framework is intended to demonstrate responsible stewardship by SDC on behalf of its customers and stakeholders. The plan also acts as a vehicle for communication with all parties with an interest in SDC's organisational and asset management practices. It provides a focus within SDC for ongoing development of good management practices, demonstrating good governance and meeting public expectations and compliance obligations. It ensures that risk is managed from an organisational perspective facilitating the effective and transparent allocation of resources to where they will have most affect on the success of the organisation in delivering its services. The process integrates with the Long Term Council Community Plan (LTCCP) process as illustrated in Figure 6.

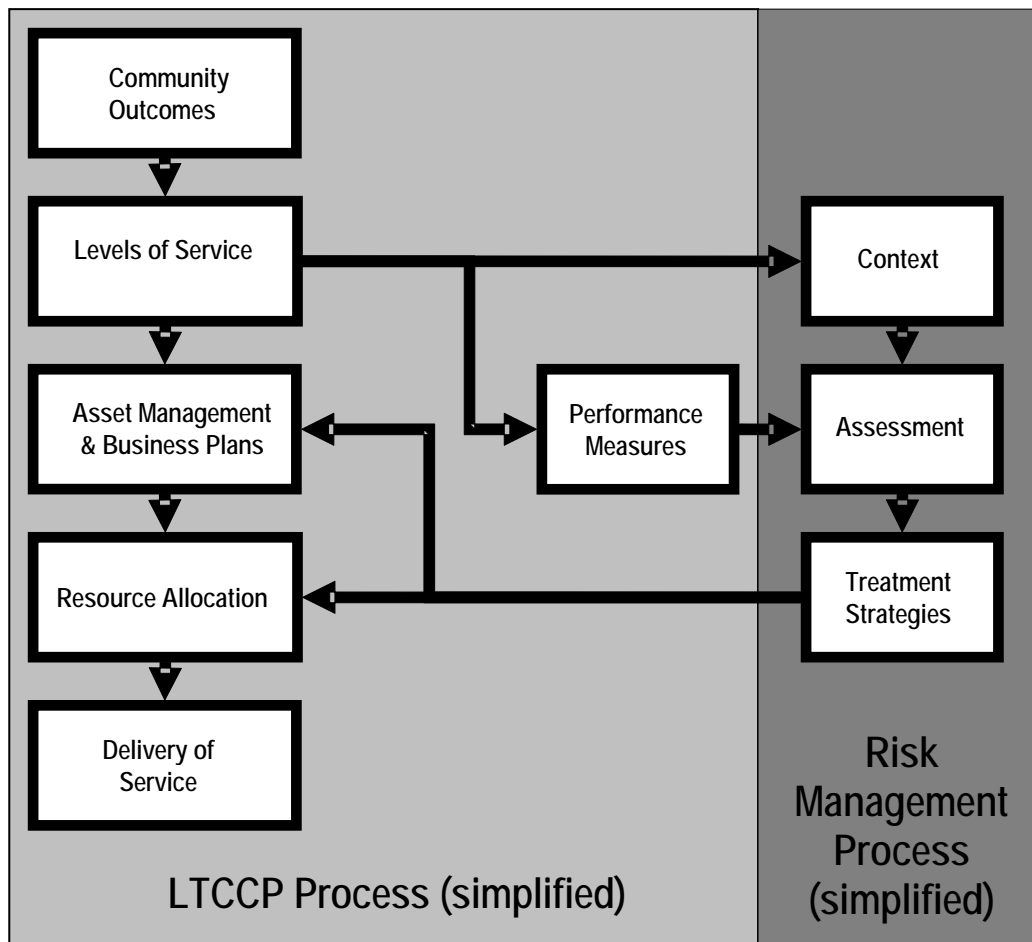


Figure 6 – IRM integration with LTCCP process

4.2.1 IRM Strategic Goal

The strategic goal of integrated risk management is:

“To integrate risk management into Council’s organisational decision making so that it can achieve its strategic goals cost effectively while optimising opportunities and reducing threats.”

4.2.2 IRM Purpose

- To demonstrate responsible stewardship by SDC on behalf of its customers and stakeholders
- To act as a vehicle for communication with all parties with an interest in SDC’s organisational and asset management practices
- Provide a focus within SDC for ongoing development of good management practices
- Demonstrate good governance
- Meet public expectations and compliance obligations
- Manage risk from an organisational perspective
- Facilitate the effective and transparent allocation of resources to where they will have most affect on the success of the organisation in delivering its services

4.2.3 Legislative Requirements

The legislative environment in New Zealand expresses both explicitly and implicitly the requirement to manage risks.

There are a number of Acts in New Zealand that imply the use of risk management or require some action that is best achieved through a process such as risk management. The Local Government Act 2002 mandates the need to address the sustainability of the four well beings - economic, environmental social and cultural. Addressing this and the requirements of the Decision Making Subpart (s76, s77, s78, s79 and s80) can be met utilising a risk based process.

The role of risk management in relation to good governance practices is expressed in the New Zealand public sector by the State Services Commission, which states that governance in the State sector includes, amongst other things, “such ‘generic’ corporate governance imperatives as ethical conduct, integrity in reporting and disclosure, and risk management” (State Services Commission, December 2006, p.5).

The Securities Commission states that Risk Management is one of nine principles to be applied in the governance of New Zealand entities and specifically states that “the board should regularly verify that the entity has appropriate processes that identify and manage potential and relevant risks” (Securities Commission, 2004, p.19).

These views are supported in relation to the management of public infrastructure by the National Asset Management Steering Group’s publication *International Infrastructure Management Manual* which reports that the Auditor-General has defined both “Core” and “Advanced” asset management as requiring risk management, with the “Advanced” level requiring integrated risk management that is consistent with the AS/NZS 4360 (National Asset Management Steering Group, 2006, p. 2.11).

4.3 Risk Management Framework (Prepared by MWH)

The risk management framework adopted by SDC is consistent with *AS/NZS 4360:2004 Risk Management* and assesses risk exposure by considering the consequence and likelihood of each risk which is identified as having an impact on the achievement of organisational objectives (Figure 7). These risks are recorded in a risk register (Appendix A)

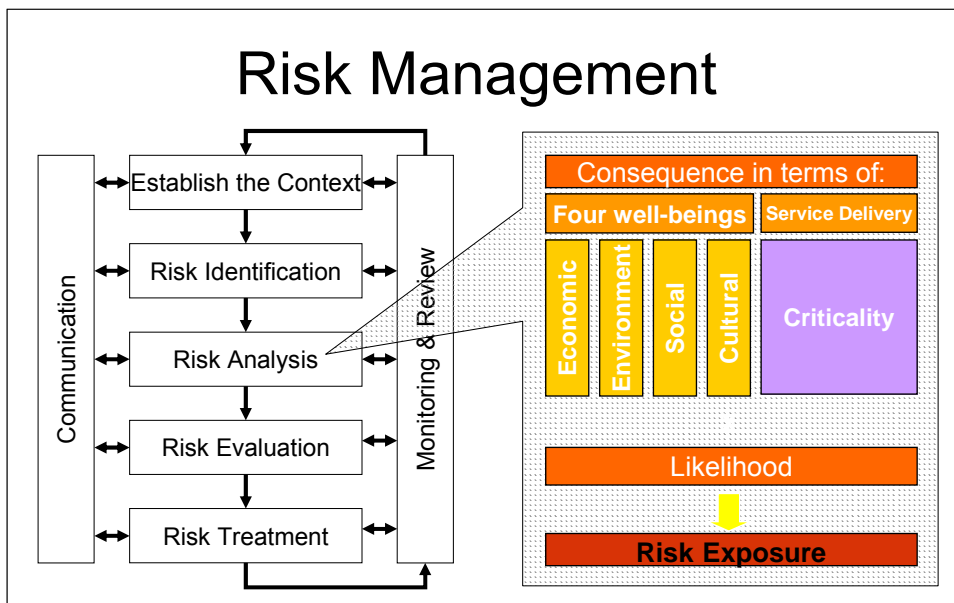


Figure 7 – Integrated Risk Management Process

Consequence categories have been developed to reflect the impact of risk events on the four well-beings, and each consequence category is scored as either “extreme”, “major”, “medium”, “minor”, or “negligible” (Appendix B). These categories address common consequences across any asset or project, however, they do not specifically account for the differences in assets. Therefore an additional category “Service Delivery” is used to reflect the essential reason for the ownership or management of any asset within the local authority – the delivery of a service (Figure 7 & Table 22). This means that the consequence of failure to deliver the service in question (the criticality of the service) can be determined by applying a factor which reflects the relative importance of the asset to the community and in turn to Council.

Table 22 – Consequence Categories

Category		Description
Service Delivery		Assessment based on the asset’s compliance with Levels of Service, performance measures and value in relation to outcomes and resource usage.
Social/ Cultural	Health & Wellbeing	Assessment of impact as it relates to death, injury, illness, health effects, life expectancy, and road toll trends
	Personal Safety & Security	Assessment of impact based on perceptions of personal safety and reported levels of crime
	Community	Assessment of impact based on damage and disruption to community services and structures, stakeholder complaints, and effect on social quality of life
	Cultural Partnerships	Assessment based on impact on relationship / partnership with Maori and other significant cultural groups
	Compliance / Governance	Assessment of effect on Statutory compliance of Council
	Reputation / Perceptions of Council	Assessment of public perception of Council and media coverage in relation to Council
Environment	Natural Environment	Effect on the physical and ecological environment
	Built Environment	Effect on the physical built environment, its amenity, and its effects on quality of life
Economic	Direct Cost / Benefit	Direct cost (or benefit) to Council
	Indirect Cost / Benefit	Direct cost (or benefit) to the wider community/economy

Similarly, the likelihood of the risk occurring is scored on a scale from “almost certain” to “unlikely” with associated probabilities and frequencies provided for guidance (Appendix C).

The risk exposure is then determined for each identified risk by multiplying the consequence and likelihood, and is presented using semantic descriptions ranging from “extreme” to “negligible” (see risk matrix in Appendix D).

Treatment strategies, or strategic plans, that mitigate each risk can then be identified, and prioritised based on the risk exposure.

In practice the framework focuses on management and significant operational risks that will have an impact greater than on that of the activity itself. This approach allows the Integrated Risk Management framework to address risks at the organisational level, as well as at both the management and operational levels within the particular council activities.

4.4 Risk Identification

As in the 2005 AM Plan risk events were identified by examining threats to achieving levels of service and community outcomes. Corporate risks were identified by a workshop with the IRM project team with many being common to all activities. Activity risks were identified by WWS.

4.5 Risk Analysis and Evaluation

Corporate risk scoring was carried out in a project team workshop facilitated by MWH. Each risk event was discussed and consequence and likelihood of the inherent risk was agreed.

Activity risk scoring was carried out by WWS with rationale for decisions coming from staff knowledge, operator feedback, as well as data from Hansen, SCADA and TRIM.

The highest of all the consequence scores assigned to each inherent risk was taken forward as the final score. This approach ensured that consideration was given to all key areas of consequence. The risk exposure was assigned a grade based on the matrix in Appendix D.

The total inherent risk for each event was calculated against which current treatment, controls, or management practices were considered and a "Current Risk" score assigned.

Completed activity level risk assessments for each scheme are in Appendix E.

SDC's appetite for risk was assumed to be "Moderate". This means that any risk event with a current risk level of greater than moderate needed to be treated. This has not been adopted by council but has been used in the absence of any current policy on risk.

4.6 Risk Treatment

4.6.1 Mitigation Measures

Risk treatment options were identified for any event with an exposure level greater than moderate. This involved identifying the range of options available and selecting the most suitable. Not all actions will involve capital work, however where this is the case the works are fed into the capital programme and prioritised alongside other planned works.

The transition of risk treatment actions from the risk register to the capital programme is a manual process undertaken at the time of AM Plan update.

4.6.2 Managing Assets by Criticality

Critical assets have been identified based on the level of disruption to service given failure of the asset. The identification has been carried out at an elementary level until processes are in place to better monitor and manage critical assets.

4.6.3 Civil Defence Emergency Management

The Civil Defence Emergency Management Act 2002 was developed to ensure that the community is in the best possible position to prepare for, deal with, and recover from local, regional and national emergencies. The Act requires that a risk management approach be taken when dealing with hazards including natural hazards. In identifying and analyzing these risks the Act dictates that consideration is given to both the likelihood of the event occurring and its consequences. The Act sets out the responsibilities for Local Authorities. These are:

- Ensure you are able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency
- Plan and provide for civil defence emergency management within your own district.

SDC belong to the Southland Civil Defence Emergency Management Group discussed below in Section 4.6.3.1.

In the past civil defence has been activated in the Southland District due to flooding and earthquake events.

4.6.3.1 Southland Civil Defence Emergency Management Group

The Southland Civil Defence Emergency Management Group is a partnership between the following organisations, administered by Environment Southland.

- Southland District Council
- Environment Southland
- Gore District Council
- Invercargill City Council
- Ministry of Civil Defence and Emergency Management
- Ministry of Social Development
- New Zealand Fire Service
- New Zealand Police
- Public Health South
- Southern Rural Fire
- Southland District Health Board
- St John

At a district level, all SDC staff undergo training in Civil Defence Emergency Response with each Area Offices equipped with the skills to respond local civil emergencies.

4.6.3.2 Engineering Lifelines

SDC is leading an Engineering Lifelines Project on behalf of the Southland Civil Defence Emergency Management Group and covering the areas of Southland, Gore District Council and Invercargill City Council. The project is due to commence shortly. It aims to review the resilience of engineering lifelines throughout the Southland Region and initiate improvements where required. It will build on and complement the work done through the completed Invercargill City Council Lifelines Project. While this work has been given the title of project, it will in fact be ongoing after an initial “project” phase expected to last about three years.

Key input reports commissioned to date include:

- P J Glassey (2006) “Geological Hazards – Southland District Lifelines Study” GNS Science Consultancy Report 2006/100
- Dr S. Oldfield and N. Cavaye (2006) “Lifelines – Review of Risk Reduction and Readiness in the Region” MWH

4.6.3.3 Business Continuanace

SDC published a Pandemic Response Plan in December 2006 (dc/06/6/6668) outlining the procedure to follow in the event of a Code Yellow or Code Red activation level²⁵ from the Ministry of Health.

The current O&M Contractor (Fulton Hogan Ltd) have a Business Continuanace Plan.

4.6.3.4 Recovery Plans

These plans are designed to come into effect in the aftermath of an event causing widespread damage and guide the restoration of full service. There is no specific recovery plan for water supply services. Preparation of one has been identified as a priority task.

²⁵ Code Yellow – detection of infected persons at our borders; Code Red – local clusters of infection in NZ

4.6.4 Public Health Risk Management Plans

Public Health Risk Management Plans (PHRMPs) have been drafted for each scheme in accordance with Section 10 of the DWS. They describe preventative measures and corrective actions given the occurrence of particular risk events.

PHRMPs are required to be checked for adequacy by a Drinking Water Assessor operating for the Ministry of Health. To date supplies with adequate PHRMPs as acknowledged by a Drinking Water Assessor (DWA) are:

- **Eastern Bush Otahu Flat RWS 2007**
- **Edendale 2007**
- **Lumsden-Balfour 2007**
- **Ohai-Nightcaps-Wairio 2008**
- **Riverton 2007**
- **Tuatapere 2008**
- **Wyndham 2008**

Other supplies soon to be lodged with the DWA are:

- **Otautau**
- **Mossburn**
- **Manapouri**
- **Te Anau**
- **Winton**

4.7 Monitor and Review

Following the completion of the IRM project it is hoped that corporate level risks will be monitored and reviewed in real time: live.

Activity level risks will be reviewed on a three yearly basis in association with the AM Plan update. This is believed to be a relevant timeframe given the size of the schemes.

4.8 District-Wide Issues

4.8.1 Introduction

The following key issues have been identified in the risk assessments in Appendix E. Scheme specific issues and solutions are detailed in Section 5.0.

4.8.2 Public Health Risk

The majority of supplies will require upgrading to meet the new Drinking Water Standards. This means different things for each supply. All urban schemes will require a PHRMP with some also requiring upgrades to intake infrastructure to improve the quality of raw water, and/or additional treatment processes to be installed. Community consultation will be required especially for the rural water supplies where the majority of flow currently goes to stock.

4.8.3 Environmental Health Risk

As more information is collected about Southland water resources it is becoming harder to get consent to take water. There are currently some water sources fully allocated by the Regional Council in order to protect the integrity of the aquifers and rivers. There may be opportunities in the future for water trading. Full allocation currently affects the following supplies:

- Lumsden
- Lumsden-Balfour RWS

4.8.4 System Failures due to Poor Asset Condition

Many schemes were built in the 1960's, 70's and 80's and are now beginning to age. There will be ongoing reticulation (pipelines, valves, hydrants, etc) renewals programmed in order to optimise maintenance costs. Electrical equipment installed in the 1990's is now beginning to show signs of age.

4.8.5 System Failures due to Lack of Capacity

Urban development, especially in traditionally rural towns, is leading to pressures on existing infrastructure to meet the levels of service. This is exacerbated in some areas by peak populations in holiday destinations. Some community's expectations are changing to be more urban where they were once more rural, i.e. demanding urban service from a rural supply.

4.8.6 Response to System Failures

Work is required to improve communication between water treatment facilities and the SDC basestation. There is a general high risk that staff are unable to respond to SCADA alarms due to lack of reception.

4.9 Statement of Significant Negative Effects

Schedule 10 of the LGA requires an outline of any significant negative effects that an activity may have on the social, economic, environmental, or cultural well being. Potential negative effects associated with the water supply activity include:

Table 23 – Significant Negative Effects

	POTENTIAL NEGATIVE EFFECTS	SIGNIFICANCE	CURRENT CONTROLS
Social Well-being	<ul style="list-style-type: none"> Health and safety risks associated with the construction, maintenance or operation of the water supply infrastructure. 	<ul style="list-style-type: none"> Not significant. Public health is protected is managed in conjunction with Public Health Risk Management Plans. 	<ul style="list-style-type: none"> Health and safety risks associated with the construction, maintenance or operation of the water supply infrastructure. The SDC has health and safety procedures in place to manage risks associated with the water supply infrastructure and associated maintenance and construction activities.
Cultural Well-Being	<ul style="list-style-type: none"> No negative effects identified. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A

Economic Well-Being	POTENTIAL NEGATIVE EFFECTS	SIGNIFICANCE	CURRENT CONTROLS
	<ul style="list-style-type: none"> Property damage resulting from mains failures. 	<ul style="list-style-type: none"> Not significant. Contract response times minimise damage from bursts. 	<ul style="list-style-type: none"> The SDC has renewal programmes for water supply mains intended to minimise the incidence of pipeline failures. All pipelines are installed in accordance with industry standards. Despite these measures water supply pipeline failures cannot be eliminated entirely. There are procedures in place to ensure that water supply pipeline failures are responded to promptly and effectively and in accordance with defined standards.
Environmental Well-Being	<ul style="list-style-type: none"> The effects of the extraction of water from bores and streams. 	<ul style="list-style-type: none"> Not significant. Extraction rates monitored by Resource Consent conditions. 	<ul style="list-style-type: none"> The effects of the extraction of water from bores and streams. The extraction of water is regulated by conditions of Resource Consents issued by Environment Southland which ensure that potential adverse effects are managed to acceptable levels.
	<ul style="list-style-type: none"> The effects on the environment of discharges of chlorinated water from maintenance activities or pipeline failures. 	<ul style="list-style-type: none"> Not significant. Any discharge will have a low dose and short duration. 	<ul style="list-style-type: none"> Discharges of chlorinated water from the water supply system are of short duration. Chlorine levels in the water are low and any effects are likely to be localised and relatively minor.
	<ul style="list-style-type: none"> The disposal of water supply treatment by-products (such as treatment sludges, backwash water). 	<ul style="list-style-type: none"> Not significant. Discharges monitored by Resource Consent conditions. 	<ul style="list-style-type: none"> The disposal of water supply treatment by-products is regulated by conditions of Resource Consents issued by Environment Southland which are intended to ensure that potential adverse effects are managed to acceptable levels.