



VULCAN MINE

Mine Operating Procedure

Risk and Hazard Management



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1. PURPOSE

This procedure outlines the has been developed to ensure compliance with RSHQ Recognised Standard 02, Control of risk management practices, which applies to risk assessments associated with PHMPs and SOPs.

This procedure has been developed to ensure compliance with section 05 of the CMSHR.

2. SCOPE

This procedure is applicable to all persons at Vulcan Mine including employees, contractors, and visitors. The controls within this procedure are mandatory.

3. DEFINITIONS

ALARA	As Low as Reasonably Achievable.
BBRA	Broad Brush Risk Assessment.
Authorised Person	A person who has the required competencies and who has been appointed by the Site Senior Executive/SSE Delegate, or their appointed representative to carry out a designated scope of duties.
CMSHA	Coal Mining Safety and Health Act 1999.
CMSHR	Coal Mining Safety and Health Regulation 2017.
CMW	Coal Mine Worker.
Competent Person	Competence for a task at a coal mine is the demonstrated skill and knowledge required to carry out the task to a standard necessary for the safety and health of persons.
CTO	Critical Task Observation.
JHA	Job Hazard Analysis.
MOP	Mine Operating Procedure.
OCE	Open Cut Examiner.
OEM	Original Equipment Manufacturer.
Principal Hazard	A hazard with the potential to cause multiple fatalities.
PHMP	Principal Hazard Management Plan.
PPE	Personal Protective Equipment.
HST	Health, Safety, and Training.
RSHQ	Resources Safety & Health Queensland
SHMS	Safety and Health Management System.
SOP	Standard Operating Procedure.
SSE	Site Senior Executive.
SWP	Safe Work Procedure.
Take 5	Personal Risk Assessment.
WRAC	Workplace Risk Assessment and Control.

4. PROCEDURE

4.1. Risk Management

The management of risk is fundamental in maintaining safe and productive mining operations.

Vulcan Mine Management Pty Ltd utilises guidance from AS ISO 31000:2018 Risk Management – Guidelines and Recognised Standard 2: Control of Risk Management Practices to establish the processes outlined in this standard.



The following diagram is derived from AS ISO 31000:2018 and displays the risk management process.

4.2. Risk Assessment Tools

The risk management process shall be followed for activities and tasks to ensure risks are at an acceptable level. As the level of risk increases, the detail and complexity of the methodology employed to identify and manage the risk increases.

The risk assessment tools described in Table 1 shall be used on Vulcan Mine sites.

Table 1: Risk Management Tools

Risk Management Tool	Trigger for Use or Review	Involvement (Minimum Competencies)
VIT-BBRA-001-Broad Brush Risk Assessment	- mine operation commencement - material changes to operations.	Facilitator Cross section of Coal Mine workers
Risk Register	- mine operation commencement - material changes to operations - formal risk assessment outcome - annual risk review - change management process.	Facilitator Representative cross section of Coal Mine workers
VUL-RSK-002-WRAC A risk assessment tool used to assess and control risks in terms of consequence and likelihood.	- Critical Risk Standard - change to SWP, SOP, PHMP - change management process.	Facilitator Cross section of coal mine workers relevant to the risk / activity with appropriate qualifications and experience.
VUL-FRM-02-03-JHA A task-based tool used to identify hazards and assign controls where a more detailed risk management tool is required.	- work not covered by a SWP. - work environment change - Coal Mine Worker initiation - supervisor initiation - where required by SOP or MOP - where required by Take 5	Supervisor Coal Mine Workers involved in the task
VUL-FRM-02-01-Take 5 Personal risk management tool utilised by workers before undertaking a task.	Commencement of a work activity or task, reassess after breaks or where task/conditions change	Coal Mine Workers involved in the task.

4.2.1. Broad Brush Risk Assessment (BBRA)

Site shall undertake a BBRA to determine risks associated with mining operations prior to the commencement of operations.

The BBRA shall be the basis for the site Risk Register and will include:

- a brief description of the mine and the physical environment in which mining activities are to take place. Including geological data, geotechnical data, geographical data, a brief history of similar mining operations in the area and where relevant, levels of support available from both internal and external providers.
- a description of the activity being assessed including, for example, the types of mining machinery and range of mining methods to be used.
- a list of all persons contributing to the risk management process together with their organisational roles, experience, and role in the process; and
- identification of hazards including technical data which identifies and quantifies, where possible, the maximum predicted level of hazard present in the workplace, equipment, or area under consideration.



4.2.2. Risk Register

A Risk Register shall be established, based on the BBRA, which shall be available to all site personnel.

The Risk Register shall be a live document and be updated following:

- completion of formal risk assessments.
- an incident investigation which highlights short falls in the SHMS.
- identification of new hazards and risks including from audits, inspections, or other monitoring activities.
- introduction of new plant or equipment.
- material changes to legislation or other relevant guidelines, codes of practice.
- the conduct of an Annual Risk Review.
- a management of change which introduced or removed certain risks; and
- changes to hazards stated in the industry database.

4.2.3. Principal Hazard Management Plan (PHMP)

PHMPs shall be developed for each principal hazard identified in the BBRA. PHMPs shall be accessible by all site personnel and a system developed for ensuring controls related to PHMPs remain effective and achievable.

4.2.4. Workplace Risk Assessment and Control (WRAC)

The WRAC considers activity-based risks and may be used to assess risks associated with SOPs. The WRAC may be used as a management tool to review, and update identified risks to ensure they remain at an acceptable level.

4.2.5. Job Hazard Analysis (JHA)

JHAs shall be completed by workers completing the task, using a site approved Job Hazard Analysis form.

A JHA must be completed for a job or task:

- where existing documentation does not cover job steps, hazards, and controls.
- when a complex task is to be undertaken.
- when there is a change to the working environment which increases the risk to an intolerable level.
- as directed by site Change Management procedures.
- as required by permits (e.g., Confined Space, Hot Work, Working at Height).
- when required by a Take 5.
- when directed by line supervision.
- where required by site procedures; or
- when an individual identifies the need.

A new JHA shall be written for every new task. JHAs from previous tasks or activities shall not be used regardless of the similarity of the work. If JHAs are being undertaken for the same task over a period of time consideration should be given to developing a SWP for the task.

JHAs shall be reviewed upon:

- identification of a new or changed hazard.
- a change to the activity being undertaken.
- Introduction of new CMWs to the task (e.g., shift or crew change).
- change in oncoming crew; and
- not more than seven days from initial issue or previous review.

Personnel involved in completing a JHA, additional to the team who will be completing the task or job, shall include:

- experienced team leader / supervisor with task or job specific knowledge, who must sign off a completed JHA and must inspect the site before signing off the JHA.
- persons with hands-on knowledge and expertise of the task or job; and
- other persons who may have relevant knowledge or understanding of the task or job and the hazards which may be present.

It is not mandatory for line supervisors to be involved in the initial development of the JHA, however line supervision is mandatory when approving and where necessary, correcting the JHA.



Wherever practicable, JHAs should be completed at the site where the job/task shall be undertaken.

A JHA shall last for a maximum of one month from the initial generation. A new JHA will need to be created once this period has lapsed.

4.2.6. Personal Risk Management (Take 5)

Vulcan Mine utilises the Take 5 process as a personal risk management tool. Each CMW shall complete their own Take 5.

The Take 5 shall be completed prior to all manual or operational tasks and should be reviewed:

- when the physical environment changes e.g., weather, visibility.
- when equipment, procedures, and processes change.
- when new hazards and/or damaging energies are identified / encountered.
- when there is new concurrent activity which commences in the area / around a task; and
- where hazards are present and managed, the controls used for the management of the hazard shall be recorded on the back of the Take 5 form with the corresponding hazard number:
 - refer to the workplace hazard prompts list at the front of the Take 5 to give further information about the hazards specific to the task; and
 - If a hazard is not able to be managed (if answered “no” to managing a hazard) or if answered “yes” to the requirement for a permit or working near a high wall or crest, the Supervisor shall be contacted.

4.3. Risk Management Processes

Risk management at Vulcan Mine is undertaken in accordance with the following process as outlined in AS/NZS ISO 31000.

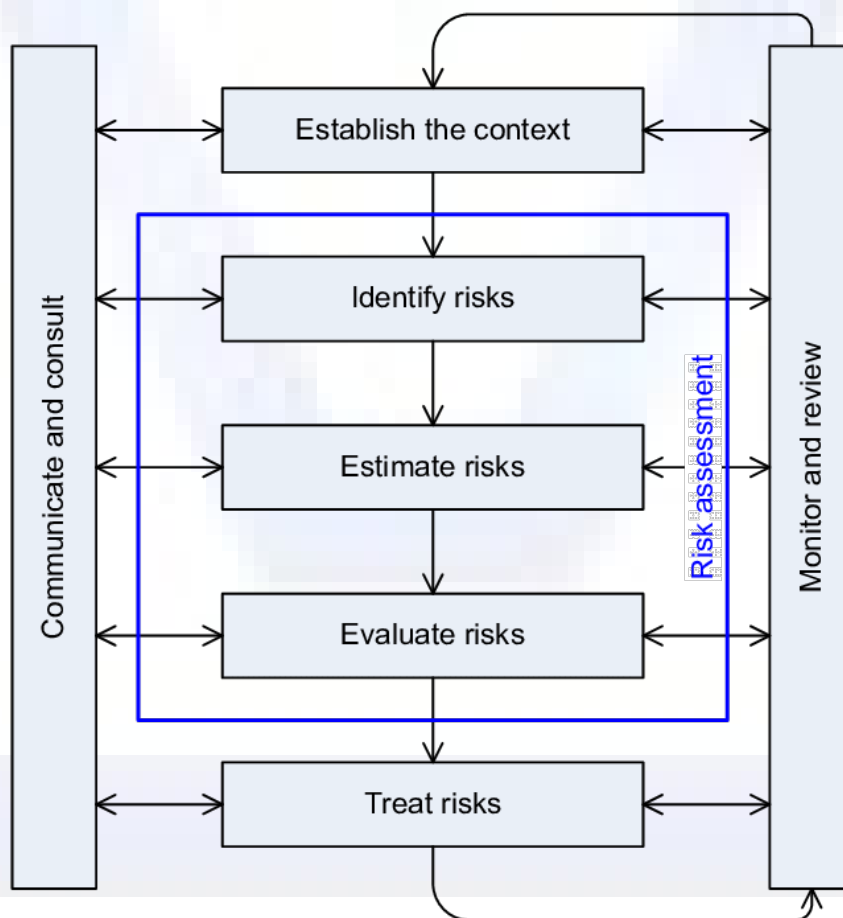


Figure 1: Risk Management Process



4.3.1. Establish the Context

Risk assessment context shall consider:

- The context needs to be consistent with the complexity of the risk assessment.
- The purpose of the risk assessment and the key objectives.
- The physical and/or process boundaries i.e., the scope the risk assessment will cover.
- Clearly articulating what if any assumptions are made throughout the risk assessment.
- The type of risk assessment tool to be used appropriate to the type of risk to be assessed.
- The expected output of the risk assessment should be defined.
- The facilitator is required to be trained, competent and authorised persons specific to the assessment tool used.
- Ensuring team members have the specific skills, knowledge and experience required. Expert information and technical knowledge may include personnel external to the business.
- The date and time allocated to undertake the various steps of the risk assessment study.
- Approval is required by the initiator of the risk assessment to ensure resources can be allocated in line with the risk assessment methodology and level of facilitator required.

The risk assessment team should comprise stakeholders, content experts and relevant cross-section of personnel involved in the process/task/activity.

4.3.2. Identify Risks

Relevant data should be recorded including technical data that identifies and quantifies, where possible, the maximum predicted level of hazard present in the workplace, equipment, or area under consideration.

Risks can be identified in several ways, including:

- review and inspection of work areas and documenting observations made.
- consulting and communicating with workers, in relation to the hazards and risks involved in tasks.
- hazard-based, location-based, or task-based identification.
- observation of external parties (including regulators).
- investigations of incidents and near misses.
- legislation and related documents (e.g., codes of practice, Australia Standards etc.).
- contractual requirements (e.g., drawings, specifications).
- procedures and documentation.
- consultation with client environmental representatives.
- consultation with management team representatives and workers.
- completion of site visit or audit.
- professional experience.
- industry information.

4.3.3. Analyse Risks

Risk is analysed considering the source of risk and the extent of exposure presented by the risk in terms of consequence and Likelihood. The process should consider the following information sources:

- legislation and related documents (e.g., codes of practice, Australia Standards etc.).
- contractual requirements (e.g., drawings, specifications).
- procedures and documentation.
- historical knowledge within the organisation or similar organisations.
- analysis of failures.
- results of incident investigations, audits, and inspections.
- findings from group exercises, other drills, and task analysis.

Completed risk assessments shall be documented and stored in the SHMS and any corresponding corrective actions associated with the risk assessment recorded and tracked through the VUL-REG-18-04-Corrective Action Register.

The Likelihood and Consequence Matrix shall be used to determine the risk (the initial risk and residual risk where relevant).



LOSS TYPE	CONSEQUENCES				
	Level 1 Insignificant	Level 2 Minor	Level 3 Moderate	Level 4 Major	Level 5 Catastrophic
People, Injury, or Illness (S)	Slight injury or health effects: first aid treatment level or less.	Minor injuries or health effects: minor medical, restricted work; or <1 workday lost case.	Major injury or health effects: >1 workday lost case; permanent disability.	Permanent total disabilities; single fatality.	Multiple Fatalities.
Damage and Cost and Time (D)	Insignificant damage to equipment. Can be immediately rectified. No loss of production. Cost <\$10,000 AUD	Minor damage. Repair with onsite resources. Loss of production <1 day. Cost \$10,000 - \$250,000 AUD	Moderate damage typically requires external resources to repair. Loss of production 1 day – 2 weeks. Cost \$250,000 - \$5M AUD	Major damage requiring significant external input to be rectified. Loss of production 2 weeks to 6 months. Cost \$5M - \$50M AUD	Future operations at site are seriously affected. Total loss of asset. Loss of production > 6 months. Cost >\$50M
Environmental Impact (E)	No environmental harm or remedial action.	Environmental nuisance event (as per EPAct 1994). No regulatory action likely. Remedial time and cost as per (D).	Environmental Harm Event (as per EPAct 1994) – localised to site. Environmental infringement notice possible. Remedial time and cost as per (D).	Environmental Harm Event – extending off-site OR Material Environmental Harm Event (as per EPAct 1994). Environmental prosecution possible. Remedial time and cost as per (D).	Material Environmental Harm Event – extending off-site. Possible suspension of license to operate. Remedial time and cost as per (D).
Community or Reputation (C)	Slight impact – public awareness may exist but no public concern. (complaint).	Limited impact – some local public concern and complaints.	Considerable impact; regional public concern and multiple complaints. Local Media attention.	Regional impact – Regional public concern. Regional media attention.	National impact – National media attention.
LIKELIHOOD		DESCRIPTION			
A – Extremely Likely		Almost certain to happen. Would be expected daily or more frequently.			
B – Very Likely		Could happen anytime. Could occur as often as weekly.			
C –Likely		Could happen sometime. Could occur as often as monthly.			
D – Unlikely		Could happen. Could occur once a year or less.			
E – Rarely		Could happen but probably never will. Would require exceptional circumstances. Occurs less than every 10 years.			

Figure 2: Risk Consequence and Likelihood Tables

LIKELIHOOD		RISK RATING			
A – Extremely Likely: Almost certain to happen. Would be expected daily or more frequently.		M (11)	H (16)	E (20)	E (23)
B – Very Likely: Could happen anytime. Could occur as often as weekly.		M (7)	M (12)	H (17)	E (21)
C –Likely: Could happen sometime. Could occur as often as monthly.		L (4)	M (8)	H (13)	E (18)
D – Unlikely: Could happen. Could occur once a year or less.		L (2)	L (5)	M (9)	H (14)
E – Rarely: Could happen but probably never will. Would require exceptional circumstances. Occurs less than every 10 years.		L (1)	L (3)	M (6)	M (10)
Risk Rating		Risk Level	Approval	Guidelines for Risk Management	
18 to 25		(E) – Extreme Risk	Site Senior Executive or delegate	The level of risk is deemed unacceptable without the relevant approval to ensure that the level of risk to as low as reasonably achievable and must be proactive in monitoring the risk.	
13 to 17		(H) – High Risk	Superintendent	The level of risk is deemed unacceptable without the relevant approval to ensure that the level of risk to as low as reasonably achievable and must be proactive in monitoring the risk.	
6 to 12		(M) – Medium Risk	Appointed Supervisor	The level of risk is deemed acceptable to undertake with active monitoring to ensure identified controls are in place and that changes to the conditions or process are identified and further risk assessed and approved by the Supervisor.	
1 to 5		(L) – Low Risk		The level of risk is deemed acceptable to undertake with active monitoring to ensure identified controls are in place and that changes to the conditions or process are identified and further risk assessed.	

Figure 3: Risk Assessment Matrix



4.3.4. Risk Control

The following factors shall be taken into consideration when determining risk controls:

- controls shall be considered using the Hierarchy of Control.
- elimination shall be adopted as the appropriate control if it is reasonably practicable to do so.
- legal requirements.
- good practice and/or industry best practices.
- the potential for the introduction of new hazards through the implementation of controls; and
- reference to other plans, training and maintenance may not meet the requirement for controls.

When applying the Hierarchy of Control (refer to Table 2 below) to reduce a risk, it is essential to recognise. 'administrative' measures do not mitigate the 'consequence'.

Table 2: Hierarchy of Control

Hierarchy	Description
Elimination	The removal of the risk by removing it or changing work processes.
Substitution	Replacing the plant or substance with another with a lower risk.
Isolation	Isolate the hazard from the person or aspect put at risk or exposed to the hazard.
Engineering	Changing the physical characteristics of plant or workplace to remove or reduce the risk.
Administration	Use of policies, procedures, work instructions, signs, training etc.
PPE	Equipment or clothing designed to provide protection.

Controls may have the objective of avoiding the risk, removing the risk source, changing the consequence, changing the likelihood, sharing the risk, or retaining the risk through informed decision making. Both short-term and long-term controls, and preventative and/or mitigating controls shall be identified. Where applicable, priorities may be established and articulated through implementation/delivery timeframes.

After implementing controls to the extent reasonably practicable to do so, if residual risk remains, the remaining risk shall be mitigated to the extent reasonably practicable to do so by implementing administrative controls and relevant PPE.

4.3.5. Risk Acceptance

The controls shall ensure work tasks are carried out to ensure any risk arising from those operations are within acceptable levels and ALARA. The risk acceptance table shall be followed.

Table 3: Risk Acceptance

Risk Rating	Risk Level	Guidelines for Risk Management	Approval Level (Sign-off) for Residual Risk
18 – 25	Extreme	Formal risk assessment shall be undertaken Critical Risk Standards PHMPs	Site Senior Executive/ SSE Delegate
13 – 17	High	Jha is used to manage the risk Proactively demonstrate hierarchy of controls Implement and adhere to controls Further review to ensure all reasonable controls are in place	Managers/ Superintendents
6 – 12	Medium	JHA is used to manage risk Proactively demonstrate hierarchy of controls Implement and adhere to controls	Supervisors
1 – 5	Low	JHA is used to manage risk. Demonstrate a proactive risk management approach	



4.4. Monitoring Risk

The monitoring of risks shall ensure the implemented controls continue to be appropriate to the task.

4.5. Critical Task Observations – CTO's

Critical Risks are associated with events that can cause grave damage to a business operation, or result in worker fatality or permanent disability. Situations where if a control is lost, a worker may be killed.

The objective of the CTO is to identify, analyse, assess, and control risks associated with Critical Hazards. A key role of leadership is to continually improve the safety performance and safety standards of our site. Effective visible leadership uses in field validation to identify any variances from the documented way and to identify the reason for any variance.

By doing this, it enables appropriate action to be taken such as training, coaching, mentoring and education to increase everyone's SHMS awareness and the overall safety culture. As per the CTO schedule, each week a CTO must be conducted on VUL-FRM-11-19-CTO by at least the following roles,

- A Supervisor/Superintendent/Manager who has a normal function associated with the Critical aspect.
- A Coal Mine worker conducting the task.

The assigned/person will conduct the CTO in areas of high exposure to the relevant Critical Risk aspect.

During the conduct of the CTO where a non-compliance or unsafe act/conditions are observed, it must be immediately controlled wherever possible, and the area supervisor/manager notified.

Any observed unsafe act or conditions (even when rectified) shall be noted in the comments section, detailing any immediate actions.

All actions assigned to personnel must be consulted and agreed by the person assigned responsibility for the action. These actions must be recorded on VUL-FRM-11-19-CTO.

Once a CTO is completed, it is to be scanned and sent via email to the direct line supervisor and safety@vitrinite.com.au for review, validation, and recording.

4.6. Annual Risk Review

The annual risk review shall be led by the HST Manager (or delegate) and involve all operational departments relevant to the risk.

Annual risk review shall be undertaken to provide an understanding of any emerging trends, identify any high-risk activities undertaken during the review period, to focus on positively promoting safety and behavioral aspects of safety, and to identify the level of leadership and commitment by the active and visible engagement in the identification and rectification of hazards.

The annual risk review shall:

- include a review of the Risk Register.
- include cross-section of CMWs and may include management, supervisors, and other workers.
- clearly define the review objectives, expected outcomes, stakeholders, resources, and scheduling requirements.
- consider event trends, relevant industry risk databases and risk tolerance.
- consider significant event investigations, changes in SWPs, PHMPs, Contractor Risk Registers, transfers and directives, improvement notices, enforcement notices etc.
- include significant risks identified and the associated document including, critical risk standards, PHMPs and SWPs.
- performance standard verification results.
- control and critical control effectiveness scores.
- completion and implementation status of risk reduction actions.
- accuracy of risk responsibilities (i.e., risk owners, critical control owners).
- significant events identified at site.
- new developments in technology with the potential to reduce the severity or likelihood of the risk; and
- new material risks or major changes which could impact the materiality of current risks.



4.7. Hazard Management Process

Identifying hazards is an integral part of the risk management system and all CMWs are responsible for identifying and rectifying hazards in line with their level of competency and notifying others if a hazard is unable to be rectified.

4.6.1. Identifying Hazards

Hazards can be identified through one or more of the following methods:

- routine inspection or housekeeping.
- personal risk management process (Take 5 process)
- BBRA process.
- JHA process.
- change management process; and
- incident investigation and analysis.
- CTO

4.6.2. Reporting Hazards

CMWs who become aware of hazards shall take appropriate action to control the hazard, including:

- immediate removal of the hazard (where practical).
- isolation of the hazard through barriers and/or barricades; and
- notification to others who may be affected by the hazard.

A flow chart for the hazard reporting process using the Hazard/Suggestion Report located in the back of the Take 5 book is contained in Annex A to this document.

5. ROLES AND RESPONSIBILITIES

SSE	Shall review and approve this procedure.
HST Manager	Shall ensure that all provisions of this procedure are implemented, and that compliance is achieved.
Managers/Superintendents	Shall be responsible for their area of operations and the implementation and application of this procedure. Provide adequate training, information, structure, and supervision to ensure that this procedure is implemented. Carry-out a periodic review of activities to ensure the appropriate application and understanding of this procedure; and Ensure immediate and appropriate steps are taken to investigate and rectify any risks to health and safety arising from these activities.
Supervisors	Ensure all CMWs are familiar with, have access to and comply with the requirements set out in this procedure.
All CMWs (including visitors and contactor)	Shall comply with the requirements of this procedure.

6. REFERENCES

- Coal Mining Safety and Health Act 1999 (Qld)
- Coal Mining Safety and Health Regulation 2017 (Qld)
- AS/NZS ISO 31000:2018 Risk management - Guidelines
- ACARP C23007 Selection and optimisation of risk controls
- ICMM Health and Safety Critical Control Management Good Practice Guide
- RSHQ Guidance Note 09 Reviewing the Effectiveness of Safety and Health Management Systems



7. RELEVANT DOCUMENTS

- VUL-BBRA-001-Broad Brush Risk Assessment
- VUL-FRM-02-03-JHA
- VUL-FRM-02-01-Take 5
- VUL-MOP-002-Change Management
- VUL-REG-18-04-Corrective Actions Register
- VUL-REG-18-03 Risk Register
- VUL-RSK-002-WRACVUL-FRM-11-19-Critical Task Observation
- VUL-FRM-11-16-Pit Inspection (Weekly)
- VUL-FRM-20-02-Mine Intersection Inspection

8. REVIEW

This document shall be reviewed at a minimum every two years, or as follows:

- when there is a change of method and/or technology and/or legal or other requirement that may affect the accuracy of this document.
- When operational changes occur that affect the currency of the document.
- when there has been a significant event to which this document was relevant; and
- as a result of relevant audit findings.

9. DOCUMENT CONTROL

Version	Date	Description	Document Controller
01	21/05/2020	Initial draft for review	Rachael Dacker
02	26/06/2020	Risk workshop cross-section	Shane Johnson
03	29/04/2021	Review and Formatting	Nicole Davey
04	31/08/2021	Review and Formatting	Rachael Dacker
05	05/10/2023	Document Review	Kelly Jensen