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**Kaius Resources**

**Standard – Risk Management**

Reference: STD-002

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# Purpose

This Standard describes the requirements for risk management as it applies to all processes in the Kaius Mine (KRES). This Standard shall include risk management of all areas within the classifications of Safety, Health and Environmental, Cultural Heritage, Reputation, Legal & Compliance, Financial and Schedule & Production.

The Queensland Coal Mining Safety and Health legislation requires the management of risks to a level within acceptable limits and to be as low as reasonably practicable (ALARP).

For areas not covered by the Queensland Coal Mining Health and Safety Act and Regulations, the relevant legislation will apply e.g. Queensland Workplace Health and Safety Act and Regulations.

# Scope & Conformance

This Risk Management Standard is inclusive of all areas and activities requiring KRES personnel to access and engage within respectively; including but not limited to exploration activities, mines, operating areas, support areas, camp/accommodation. The Standard shall be applied to all elements of work including, but not limited to, the design, construction, operation, maintenance and modification and decommissioning of all plant and equipment. This Risk Management Standard applies to all mine workers including exploration personnel, permanent, temporary and contract employees.

All relevant legal and other requirements must be identified and complied with in addition to the requirements of this standard: ensure a documented risk management framework and process that are consistent with this procedure and ISO 31000:2009 – Risk Management, as relevant for the business or undertaking.

At all times, elimination of risk is the priority and must be considered, prior to the implementation of further risk controls.

# Authority

This procedure can only be altered with the approval of the Site Senior Executive (SSE).

# Responsibilities

**Site Senior Executive (SSE)**

Site Senior Executive shall ensure:

* That all of the provisions of this Standard are implemented, and that compliance is achieved.
* Adequate resources are provided to maintain compliance with the requirements of this Standard, and
* The application and requirements of this Standard are periodically audited and reviewed.

**Supervisors**

Supervisors shall ensure:

* That the requirements of this Standard are implemented.
* That workers, including contractors, are trained in accordance with the Standard.
* All work undertaken within their area of responsibility is conducted in accordance with the requirements of this standard.
* Monitor compliance with this Standard, and
* Ensure this Standard is readily available to all workers and contractors.

**Mine Workers**

Mine Workers shall:

* Undertake the training and assessment provided by the SSE.
* Act in accordance with this Standard.
* Not undertake any tasks for which they are unable to safely complete.
* Undertake the appropriate level of hazard identification and risk management prior to undertaking tasks.

# Application of Risk Management

The business or undertaking must apply the risk management process when:

* Starting a new activity or project and at all stages of it. For example, concept, initiation, definition, planning, execution, performance monitoring, control and completion.
* Change, as defined by a management of change process or any change that may have an impact on objectives.
* Introducing, purchasing or modifying: plant, substances, structures, processes etc.
* Closing or de-commissioning: structures, plant, infrastructure, business, information or communication systems etc.
* New information, about a risk becomes available or issues are raised, by workers or stakeholders about a risk.
* There is an incident or serious situation; this includes managing risk associated with developing a potential response that may include unplanned changes.
* When required by legal or other requirements, or there is uncertainty about an activity or situation that could impact on objectives.

# Communication, Consultation and Recording of Risk

At all stages in the risk management process, communication and consultation is to occur with relevant people, to ensure involvement and to inform and support the process.

A key step in this process is selecting a team of people with relevant experience and knowledge of the subject area to be included in and complete the risk assessment.

A risk communication process is to be established to ensure relevant people are kept informed about hazards, risks and controls.

The risk management process must be documented / recorded in accordance with document management processes.

# Definitions and Abbreviations

**Table 1: Definitions and Abbreviations**

| **Phrase/Abbreviation** | **Definition** |
| --- | --- |
| As Low As Reasonably Practicable (ALARP), orAs Low As Reasonably Achievable (ALARA) | A process that applies a graded approach to reducing risk. The goal of this process is not merely to reduce risk, but to reduce risks to levels that are as low are reasonably practicable or achievable. |
| BBRA | Broad Brush Risk Assessment – risk assessment methodology for completing Project level risk assessments |
| Business or undertaking | means all Kaius Resources owned or managed businesses, operations, projects and sites, including Kaius Resources contracted scopes of work and contractors |
| MQSHA | Coal Mining Safety and Health Act (1999) |
| MQSHR | Coal Mining Safety and Health Regulation (2017) |
| Competent Person | A person who has the necessary training, skills and capability to carry out the task |
| Consequence | Consequence is the most reasonable outcome of an event or situation expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain |
| Control | The means used to manage risk. In particular, a policy, standard, procedure, device, system, communication, or other action that acts to limit uncertainty in the achievement of business objectives and/or to ensure compliance with the Controls are the result of control actions |
| Critical Controls | Controls that if they were otherwise not in place the risk event would be inevitable (‘showstoppers’). A control or set of controls that have direct influence over the hazardous energy involved. |
| Critical Risk | Risk issues are considered critical if they are rated equal to or higher than VH17 as prescribed in this document. (Appendix A Risk Matrix) |
| Facilitated Risk Assessment | Formal risk assessment facilitated by an accredited facilitator. Any level 2 or level 3 risk assessment processes: WRAC, HAZOP, FMEA etc |
| FMEA | Failure Modes and Effect Analysis – risk assessment technique: step-by-step approach for identifying all possible failures in a design, a manufacturing or assembly process, or a product or service. |
| Frequency | A measure of likelihood expressed as the number of occurrences of an event in a given time. |
| Hazard/Risk Source | Hazard: A source of potential harm, injury or detriment (expressed as a damaging source of energy) |
| HAZOP | A hazard and operability study: structured and systematic examination of a complex planned or existing process or operation in order to identify and evaluate problems that may represent risks to personnel or equipment. |
| Likelihood | The probability of an event resulting in the consequences identified. Used as a qualitative description of consequence probability |
| LOPA | Layer of Protection Analysis – risk assessment technique: an analysis of the level and quality of protection supplied by the control structure listed to manage a hazard |
| Loss | Any negative consequence, financial or otherwise |
| KRES | Kaius Resources  |
| Monitor | To check, supervise, observe critically, or record the progress of an activity, action or system on a regular basis in order to identify change |
| Personnel | Includes all people working in and around the site (e.g.) all contractors, sub-contractors, visitors, consultants, project managers etc. |
| PPE | Personal Protective Equipment |
| Principal Hazard | A hazard with the potential to cause multiple fatalities |
| Principal Hazard Management Plan (PHMP) | A Principal Hazard Management Plan must:1. identify, analyse and assess risk associated with principal hazards; and
2. include standard operating procedures and other measures to control risk.
 |
| Residual Risk Rating | This Rating represents the level of residual risk associated with the Critical Risk event after taking into account the controls applied |
| Review | An examination of the effectiveness, suitability and efficiency of a system and its components. |
| Residual Risk Rank (RRR) | Residual Risk Rank. ISO 31000 defines Residual Risk as the risk remaining after Risk Treatment. For the purposes of this study, Residual Risk is the risk remaining after the impact of Additional Controls |
| RCE Form | Risk Control Evaluation Form. KRES Layer of Protection process for evaluating controls as part of SOP development process |
| Risk | The chance of something happening that will have an impact on objectives.Risk is measured in terms of a combination of the consequences of an event and their likelihood. Risk may have a positive or negative impact |
| Risk Assessment | The overall process of risk identification, risk analysis and risk evaluation. The process used to determine risk management priorities by evaluating and comparing the level of risk against predetermined standards, target risk levels or other criteria. |
| Risk Assessment Owner | Person/s conducting Level 1 Risk Assessment (JSEA/Take 5) |
| Risk Evaluation | Process of comparing the results of risk analysis with risk criteria to determine whether the risk and /or its magnitude is acceptable or tolerable |
| Risk Event | The description of the occurrence or change of a particular set of circumstances.One or more risk events may describe a risk issue |
| Risk Identification | The process of determining what can happen, why and how. |
| Risk Management | Systematic application of management processes and practice to the risk activities including identifying, analysing, evaluation, treating, monitoring and reviewing risk. Risk management also includes the activities of communicating, consulting and establishing the context of the risk |
| Risk Profile | Description of any set of risks detailing the qualitative or quantitative order of the set of risks |
| Risk Register | Record of risks including risk evaluation and control processes for Level 2 and above facilitated risk assessments |
| Shall | Indicates that a statement is mandatory |
| Should | Indicates a recommendation |
| SSE | Site Senior Executive – statutory position held on site |
| WRAC | Work Place Risk Assessment and Controls – a risk assessment technique |

# Risk Management Procedure

## Risk Management Process

The risk management process is an integral part of good management practice and an essential element of good corporate governance. The Risk Management Process is outlined in Figure 1.

**Figure 1: The Risk Management Process – AS/NZS ISO 31000**



## Risk Management Overview – Selection of Levels and Types of Risk Assessment

The Kaius Mine Risk Management Approach is outlined in Figure 2 below.

There are 3 levels of evaluation:

* Level 1 – Pre-Task Hazard Evaluation (activity based).
* Level 2 – Qualitative Risk Assessment (more-complex/hazard based).
* Level 3 – Semi-Quantitative Risk Assessment (SQRA).

This process meets the requirements of the Coal Mining Safety and Health Act 1999, Recognised Standard 02 – Risk Management and is consistent with AS/NZS ISO 31000:2018 Risk Management – principles and guidelines. A summary of risk assessment techniques can also be found in AS/NZS ISO 31010:2018 Risk Management – risk assessment techniques.

Figure 2: Risk Management Approach



**Semi-Quantitative Risk Assessment (SQRA)**

Critical Risk – Includes Principal Hazards and Multiple Fatality Risks

**Qualitative Risk Assessment (QRA)**

Workplace Risk Assessment and Control (HAZOP/WRAC)

**Pre-Task Hazard Evaluation**

Take 5/Job Step Analysis (JSA)

A Table detailing the triggers for selecting the various levels of risk assessment and the applications of different types of risk assessment can be found below in.

### Level 1 – Pre-Task Hazard Evaluation

Task-based analysis is used to identify any issues that require specific controls, or where further and more rigorous analysis is required to ensure work is performed at a risk level as low as reasonably achievable.

* Level 1 hazard evaluations are to be available at the location of the work covered by the evaluation.
* Hazard report forms can be used to report hazards or potential hazards for corrective action before they result in an incident or injury.
* Safety observations should include a review and discussion about the details included within either the Take 5 or Job Safety Environment Analysis (JSEA). Take 5 – Personal Hazard Evaluation
* Take 5 is based on a self-maintained booklet or form that contains a basic set of hazard prompts and a basic checklist. It is intended to remove complacency and increase awareness through ensuring the workforce consciously thinks through their jobs or tasks prior to initiating, and during the work.
* Each individual shall complete a Take 5 and ensure that their place of work is safe prior to starting work. They shall assure themselves that they are aware of the risks associated with any tasks they are about to undertake. The necessary controls must be applied to reduce those risks to ALARP.
* This process is required prior to commencing work each shift and whenever the task or conditions change during the shift.
* The Take 5 Form is available through the KRES Document Management System.

#### Job Safety Environment Analysis

* A JSEA is a task-based analysis, to be used to identify hazards and controls where a more rigorous analysis than a Take 5 is required to ensure work is performed in an appropriate manner. A JSEA requires the risk ranking of hazards to establish levels of risk acceptability.
* These evaluations can be completed by an individual or by following a more structured approach through a workgroup or small team.
* JSEAs can be completed by a worker who has inspected the work area. JSEAs can be signed off by a worker if all risks identified are ranked at a Low level (L1 to L5 inclusive). In the event that Medium level risks are identified during completion of the JSEA, a Supervisor is required to sign-off the JSEA prior to any work commencing. Refer to sign-off authority located in the **Table 6: Risk Acceptability and Sign-off Criteria.**
* A JSEA is required where there is no valid procedure to undertake the work, where the procedure does not cover the work undertaken or where the scope of work needs to deviate away from the procedure.
* JSEAs shall be handwritten to reflect the specific conditions and task requirements of the work being undertaken.
* The JSEA Form is available through the KRES Document Management System.

### Level 2 – Qualitative Risk Assessment

This level of evaluation applies a qualitative risk assessment technique, which provides an efficient and effective method of identifying and analysing risk issues (hazards/aspects or opportunities) and identifying and evaluating controls.

The Qualitative Risk Assessment comprises the following steps:

* Risk Assessment initiation
* Scoping, Team Formation, Establishing the Context
* Hazard Identification
* Risk Analysis
* Risk Evaluation, and
* Risk Treatment.

Level 2 assessments may also include other team-based hazard identification and assessment approaches that may be required for formal engineering-based assessment of hardware, design or control systems.

A key requirement of risk assessment is to utilise a consultative process: this means including a team of relevant personnel to complete a Level 2 risk assessment. These are the people who are: responsible, accountable, consulted or informed about the process. The team should be carefully considered: team members may consist of (but not necessarily limited to) workers who interact with the risks / operate and apply controls; subject matter experts who have relevant competence, experience or relevant technical expertise for the risk context; and the person(s) who are accountable / responsible for the risks being assessed and the controls to be implemented.

The key benefit of applying a team-based approach is that it expands the degree of knowledge and experience which can be drawn upon, increasing the ability to make the most appropriate risk management decisions. Team based approaches also build commitment and understanding within the site, operation, and project or management team.

Any risk ranking should follow the requirement detailed in Appendix **Section 12.1** Risk Matrix, Likelihood, Consequence and Acceptability Tables**.**

#### Skills and Competency

Before facilitating a Level 2 risk assessment session, persons must hold the competency RIIRIS402 (G2), an equivalent or higher-level risk competency.

All other formal Risk Assessment methodologies are to be facilitated by risk facilitators possessing skills specific to the particular Risk Assessment process.

Where legislation requires specific risk related competencies for positions, these must be obtained.

#### Facilitated Workplace Risk Assessment and Control (WRAC)

Level 2 qualitative risk assessment at KRES is predominantly satisfied using a Workplace Risk Assessment and Control (WRAC) method and template. This technique applies a facilitated team-based approach to risk identification and risk evaluation. The risk assessment uses the Kaius Mine risk ranking methodology to assess the level of risk in accordance with defined consequence and likelihood factors. The consequence evaluation is based on the approach known as selecting the most reasonably likely consequence associated with control of the risks. The output is focussed on ensuring risks are effectively controlled to ALARP.

#### Alternative Qualitative Methodologies

There are various methods of facilitated risk assessments that are available including, but not restricted to:

* Failure Mode and Effects Analysis (FMEA)
* Bowtie analysis, and
* Hazard and Operability Study (HAZOP).

The method to be used will depend on the type of risk to be assessed and the outcome/s required. These processes shall be facilitated by experienced risk practitioners.

#### Contractor Risk Assessments

Contractors will conduct risk assessment, communicate and maintain relevant risk management data as per the directives prescribed in this Standard and the Contractor Management System: MOP-022 Contractor Management System Ver 1.

### Level 3 – Semi-Quantitative Risk Assessment

A Level 3 Risk assessment is triggered when a lower level risk assessment shows a residual risk rating of equal to or higher than VH17 after additional controls have been put in place.

For Level 3 Risk Assessments, it may be more appropriate to complete independent assessments involving disciplined specialists.

Risks classified by Kaius Mine as Critical Risks must be escalated to this form of assessment. Additional information and understanding of Critical Risks may be derived through the use of a variety of level 3 risk methodologies.

### Principal Hazard Management Plans

Events that have the potential for multiple fatalities (Level 5 consequences) require the development and implementation of Principal Hazard Management Plans (PHMP).

All PHMPs must be completed using the Kaius Mine approved form and are to be reviewed on a regular basis.

Site PHMPs are to be communicated to all personnel intending to perform work at that particular site.

Table 2: Levels of Risk Management – Applications and Triggers

| **Level** | **Trigger** |
| --- | --- |
| Level 1 – Pre-Task Hazard Evaluation |
| Take 5 | Prior to all tasks or dutiesWhen there is a change in work scope or conditionsIdentification of new hazards with potential to impact outcome of activity |
| Job Safety Environment Analysis (JSEA) | Existing documentation does not cover all job steps, hazards and controls for how to perform the task safely (e.g. Work Instruction, Procedure, etc.)When required by a Take 5Limited knowledge of the risks associated with a task (e.g. new task)There is a change to the working environment which require additional controls to be implemented (e.g. wet conditions, poor visibility)A complex task is to be undertaken (e.g. complex lift)As directed by Change ManagementAs required by Permits (e.g. Confined Space, Hot Work, Working at Height)For any task deemed higher risk by Field Supervisors and/or Safety and Health Managers (e.g. a task that has been overrepresented in Significant Incidents)Where directed by SupervisionWhen an individual identifies the need |
| Level 2 – Qualitative Risk Assessment |
| Workplace Risk Assessment and Control (WRAC)Hardware or Design Reviews Hazard and Operability Studies (HAZOP)Failure Mode and Effect Analysis (FMEA)Level of Protection Analysis (LOPA)Formal identification of critical controls and controls assessments (LOPA) | Uncertainty remains as to the effectiveness of controls after a level 1 Risk AssessmentPotential for single or multiple fatalitiesPrincipal hazards as defined by LegislationTo develop a business, department and section’s SHE Risk Register & risk profileBaseline compilation of a formal Risk Register and action prioritiesWhere identified by Change ManagementPost incident review of Risk Register and controls from incident investigationStakeholder concerns. (e.g. complaints or adverse symptoms)At the feasibility stage of projects to identify all potential hazards and risks associated with construction process or the maintainability of the facilityMajor Project Concept Studies (including design, construction, commissioning or decommissioning as applicable)As a component of closure planning process Prior to shut down activitiesDevelopment of a standard operating procedure (SOP) as defined by Queensland Coal Mining Safety and Health Regulations. Use of LOPA – Kaius Mine personnel use Risk Control Evaluation (RCE) Form |
| Level 3 – Semi-Quantitative Risk Assessment |
| Bowtie analysisRisk and Consequence modellingFault and/or Event Tree AnalysisFormalised/quantitative environmental impact assessment techniques | Extreme Residual Risk Rating (RRR) from Level 2 Risk AssessmentLevel 2 assessments have not provided adequate information about risk or controls for decision-makingWhere identified by Change ManagementMajor Project Feasibility Study (including design, construction, commissioning or decommissioning)Significant stakeholder concerns (e.g. Complaints or adverse symptoms)High and Critical Incidents - post incident review of Risk Register and controls from incident investigationCatastrophic Risk Study |

## Establish the Context

The context is the situation / environment within which hazards / risks exist. To establish the context, the facilitator/risk assessment owner must:

* Understand the objectives of the risk assessment and the material risks that can impact on those objectives: material risks are seen as those that potentially have a significant effect on objectives.
* Understand the risk context, i.e. the scope to which the risk management process is to be applied and how it will be applied.

For Level 1 risk assessments such as a JSEA, the context can be as simple as describing the nature of the task/activity and exactly what is being risk assessed. Wherever possible, try to describe any extenuating circumstances and environment variables which may affect the results of the risk assessment.

Level 2 and 3 risk assessments (managed by an accredited facilitator) require a more detailed context be established and terminology such as internal and external contexts can be used.

### The external context

The external environment is that within which the business seeks to achieve its objectives. External factors to consider include:

* Regulatory / contractual requirements; external commitments / agreements; and the competitive, financial, political environment the business operates within.
* Social, community, cultural factors and the expectations, relationship, perceptions and requirements of external stakeholders, e.g. clients, regulators, communities etc.
* Specific external inputs, e.g. supply, materials, energy or labour.
* Key external drivers / trends; and the strengths, weaknesses, opportunities and threats associated with these.

### The internal context

The internal context is the work environment, processes, people, plant / equipment, configured by the business and directed at achieving its objectives, including:

* Overarching policies, strategies, governance structures etc. and any upcoming changes that can affect objectives or involve risks.
* The roles, accountabilities and resources available, including internal capability in terms of people, systems and processes.
* The risk tolerance and appetite of the business and the existing risk management activities and their effectiveness.

### The risk assessment scope

An important part of the risk assessment context is also developing the scope to reflect the parameters of the assessment. This includes:

* Setting the scope and boundaries of the risk assessment e.g. what is being assessed, what is not, objectives impacted, the consequence level of interest etc.
* Establishing roles, responsibility and resource requirements of the assessment, e.g. the people are accountable, responsible, consulted and informed.
* Selecting the risk assessment, (refer to Section **8.2**).
* Establishing levels or types of risk that are or are not to be included in the risk assessment (**Section 20** Risk Matrix, Likelihood, Consequence and Acceptability Tables).

Establishing the context/scope is a very important part of the risk management process as it enables the business to establish when change has occurred and the point at which a risk assessment needs to be reviewed.

## Hazard Identification

### Identifying Energy Based Hazards

There are several methods of hazard identification available as outlined in relevant standards such as AS/NZS ISO 31010. Kaius Mine utilises the Energy Model as the preferred method for identifying hazards during risk management activities. All hazards can be identified and categorised as a form of energy: this process allows the assessor to focus the analysis and controls on tangible risks. Kaius Mine utilises the following energy-based hazards in the company’s formal risk assessments.

**Gravitational**: This includes both dropped objects and people falling from one level to another.

**Kinetic / Movement:** includes all types of movement from mobile plant, people and mechanical components.

**Bio-Mechanical**: includes all human movement and manual handling hazards.

**Electrical**: includes all voltage ranges of electrical power, voltages must be included in the description.

**Thermal**: includes both hot or cold, the working environment or plant & equipment, describe in detail.

**Chemical**: any hazardous substance or dangerous good that may be present or used in the workplace.

**Radiation**: this energy includes both ionising & non-ionising radiation, an example would be UV sunlight.

**Noise**: includes potential ambient noise and well as noise produce by activity.

**Vibration**: consider whole body vibration issues (Mobile Plant) as well as localised vibration (hand tooling).

**Pressure**: includes air, hydraulic stored or operating pressurised systems.

**Biological / Animal**: includes all plants, animal, or bacterial and viral.

**Psychological**: these energies are external issues that may affect people, stress, bullying family issues etc.

### Referred Hazards/Issues

In the event that hazards, issues or opportunities are identified that fall outside of the scope of the area being risk assessed, these details can be referred for further analysis in other risk studies carried out for the business/project.

## Risk Analysis

Analysing risk is the process of establishing how each hazard identified during a risk assessment is being controlled. Tools such as the Hierarchy of Controls may be used to assist with the identification of control strategies to manage hazards. There are two classes of control that can be listed within a risk assessment: Existing Controls and Additional Controls. A sound process when considering and listing controls is to start with higher order controls (Hierarchy of Controls Model) such as design, engineering, elimination etc, and then work on identifying softer controls such as procedures, training, warning signs and PPE.

### Existing Controls

In the first instance, team members should be urged to identify and list available ‘Existing Controls’ for each hazard identified. Confusion sometimes exists regards the qualification of an existing control. A good test regards whether a control is an existing control is to question if it is formal/real. A formal or real control includes one that is referenced and exists in SHMS documents such as standards, procedures, forms and directives. In the event that a control is found to be an **informal** one, it should **not be** listed in the **Existing Control column** of the risk assessment but instead listed as an **Additional Control** for follow-up action after conclusion of the risk assessment.

Wherever possible, existing controls should be further analysed during the risk assessment regards the quality of the intended control. Risk assessment team members should question if the listed control works as intended in minimising risk in addition to querying if the control is actively used to manage the hazard. Asking these two questions may establish that there are gaps in the perceived management of a hazard. To reduce or remove this gap, Additional Controls/Actions may be recommended to further minimise identified risk.

### Additional Controls

Additional Controls are to be listed in the allocated column of the risk assessment and following, transferred to the Action Register for further risk management and follow-up activity.

## Risk Evaluation and Acceptability

Level of ‘Risk Acceptability’ should be established for all risks identified in KRES risk assessment. In most situations, level of risk acceptability will be determined through a qualitative risk ranking process and comparison with the KRES Risk Acceptability Criteria. Some Level 1 risk assessment including the Take 5 process does not incorporate the use of risk ranking methodology. In the event that a risk is identified that is perceived to be unacceptable, the conduct of a JSEA (or higher) Risk Assessment must be carried out. Most Level 1 and all Level 2 risk assessments require qualitative risk ranking using the KRES Risk Matrix and associated Risk Criteria. The details of these can be found in **Risk Matrix, Likelihood, Consequence and Acceptability Tables**.

The intent when using the KRES Risk Matrix to qualitatively risk rank controlled hazards is to use the concept of ‘Maximum Reasonable Consequence.’ This concept includes rating the probability (likelihood) of the most likely most reasonably likely consequence when the effect of all control strategies has been factored. The process must include first establishing a reasonable consequence for the risk situation being described and then determining the ‘Likelihood’ of the consequence occurring. This requires the use of the **Table 5: KRES Risk Consequence Criteria** and then the

**Table 4: KRES Likelihood of Consequence** Criteria**.** For the purposes of this Standard, a Residual Risk Rank is that calculated after the effect of existing controls are factored in. See definition of Residual Risk Rank in Table 1: Definitions and Abbreviations.

Activities at KRES are restricted based on the relative risk levels associated with an activity. Several levels of sign-off (authority to work) exist for risks rated from Low to Very High. For example, activities with an associated L1 to L5 level risk classification require worker level of sign-off prior to conducting work; M6 to M9 level risk classifications require Supervisor sign-off prior to conducting work; H10 to H16 level risk classifications require Manager/Superintendent sign-off prior to conducting work and VH17 and above level risk classifications require SSE authorisations.

The intent when managing material risks identified within KRES risk assessments is to mitigate all inherent risks to an acceptability/tolerability level that is As Low As Reasonably Practicable (ALARP Concept).

## Risk Treatment, Monitor, Review and Audit

The intent of risk management protocols outlined in AS/NZS ISO 31000 is to systematically treat risks following formal risk assessment. Risk treatment at KRES consists of several routine stages and includes various risk management tools. These largely consist of registers and associated processes that enable systematic monitoring, review and audit of KRES risk management data.

### Risk Register

All material KRES risks shall be recorded in the KRES Risk Register. The Risk Register must contain relevant risk details and classifications that enable material KRES risk to be prioritised and reviewed at corporate and operational levels. The register is a valuable tool that can be used to review actual performance against the data reflected within the register. Risk Register data should be routinely reviewed alongside hazard report and incident report data. These reviews must happen quarterly. Details of these registers are contained below.

The KRES Risk Register shall be monitored, reviewed and updated:

* Following further Level 2 and higher risk assessment activities at KRES, and
* Following significant incidents, investigation learnings or change.
* Routinely every 3 to 6 months.

### Contractor Risk Assessments and Registers

The primary KRES Risk Register shall be maintained by Kaius Resources. Contractor shall develop and maintain their own risk assessment based on their scope of work. Material risks shared by a contractor and KRES must be reflected in the KRES Risk Register. Contractor risk assessments are to be conducted in-line with mandates prescribed in this Standard and MOP-022 Contractor Management System Ver 1. Contractor risk assessment data is to be reviewed by Kaius Resources personnel and new risks introduced to the operation are to be included in the KRES Risk Register.

### Risk Assessment Actions Register

In the event that risk assessment processes identify the need for Additional Controls, these must be recorded, and a system put in place to manage these actions. Additional Controls data will be entered into the Risk Assessment Actions Register where they can be:

* Tracked beyond the life of the document.
* Assigned responsibilities for control implementation to control owners.
* Included in an action tracking system that is approved for use by the relevant Kaius Resources manager.

### Hazard Reporting Register

The Hazard Report Register for KRES is a record of hazards that are reported as part of ongoing operations. This data is ranked and should be used to review risk data relevant to KRES operations. This data is able to be reviewed against risk data stored in the KRES Risk Register.

### Incident Report Register

The Incident Report Register collates all incident report data relevant to the KRES. This data is ranked and should be used to review risk data relevant to KRES operations. This data is able to be reviewed against risk data stored in the KRES Risk Register.

### Monitor, Review and Audit Frequency

Kaius Mine processes enable routine monitoring of risk management information. Processes including but not limited to pre-start checks, on-boarding BBRA reviews, JSEA, Take 5, hazard reporting and tool-box meetings all form steps in the risk monitoring process. Supervision of workers is one of the most consistent and powerful means of monitoring control strategies being used at KRES. The RCE Form is a dedicated tool for reviewing and establishing the availability of risk management controls in use at KRES.

A review of risk assessment data should be undertaken:

* Every 3 years in the event that there is no change to the risk assessment scope.
* In the event that details relevant to the scope of a risk assessment change.
* In the event that an incident relevant to the scope of a risk assessment is reported.

The Risk Register maintains key KRES risk data. This register should be reviewed in-line with mandates described above in Section 8.7.1.

## Risk Data Verification and Validation

An annual risk management verification and effectiveness review is required to provide a clear understanding of the level of risk management compliance and improvement. This review is to include:

* Verification that controls are physically in place and operating as designed when they are designed to operate; and are effective at reducing risk; and that there are not any new risks introduced.
* Verification that operational controls, including procedures, information / communication, instruction, supervision and training are in place and complied with.
* Verification that the risks and controls have been communicated to relevant persons, and that persons affected by the risk or controls have received appropriate information, training, instruction and there is appropriate supervision in place based on the risk.
* Formal trending of lead and lag risk management KPI’s.
* Identification of any new critical risks or major changes that could impact the risk profile.
* Completion and implementation status of risk reduction and improvement actions.
* All significant incidents that have been identified at the operating site, and externally related to the operating site’s risk profile, and
* New developments in technology that have the potential to reduce critical risk.

Controls must be monitored, checked or verified as part of the RCE Form process (see above). Following this, controls must be reviewed in line with the SOP document review process.

A review of the Risk Register is required where there have been significant changes to the scope of work, resulting in updates to the Register (see above).

### Critical Control Effectiveness

Critical control effectiveness should also be included as a specific component of ongoing management activities, including internal inspection, safety observations and audit programs.

## Communication and Consultation

Communication and consultation are integral to the risk management process and should always be a key consideration. Appropriate communication and consultation must be undertaken to:

* Ensure clarity and understanding of hazards and risks specific to the particular workplace exists.
* Improve general understanding of risk and the risk management process.
* Ensure the varied views of the stakeholders are considered.
* Ensure all participants are aware of their roles and responsibilities, and
* Ensure legislative compliance can be demonstrated.

In addition to communication with the participants of a risk assessment, the results of a risk assessment must be communicated to the relevant and appropriate level of management.

# Risk Management Standard Review Criteria

This standard shall be reviewed:

* Every three years
* When there is a change of method and/or technology that may affect the accuracy of this document, and
* When a significant incident has occurred that is relevant to this document and its subject matter.

# Safety and Environment

Safety and Environment are covered in the body of this standard.

# Attachments, References and Related Documents

## References and Related Documents

AS/NZ ISO 31000 Risk Management – Principles and Guidelines

AS/NZS ISO 31010 Risk Management – Risk Assessment Techniques

AS/NZS 4801:2001 Occupational Health and Safety Management Systems.

MOP-022 Contractor Management System.

Take 5 Form – Kaius

JSEA Form – Kaius

Change Management Standard – Kaius

QLD Coal Mining Safety and Health Act 1999

QLD Coal Mining Safety and Health Regulation 2017

# Appendix

## Risk Matrix, Likelihood, Consequence and Acceptability Tables

Table 3: KRES Risk Matrix

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| --- |
| **Consequence** |
| **Likelihood** | **Insignificant** | **Minor** | **Moderate** | **Major** | **Critical** |
| Almost Certain | **M (7)** | **H (11)** | **VH (19)** | **VH (24)** | **VH (25)** |
| Likely | **M (6)** | **H (10)** | **VH (18)** | **VH (22)** | **VH (23)** |
| Possible | **L (4)** | **M (9)** | **H (16)** | **VH (20)** | **VH (21)** |
| Unlikely | **L (2)** | **L (5)** | **H (12)** | **H (14)** | **VH (17)** |
| Rare | **L (1)** | **L (3)** | **M (8)** | **H (13)** | **H (15)** |

Table 4: KRES Likelihood of Consequence Criteria

|  |
| --- |
| **Likelihood of the Consequence Occurring** |
| **Rating** | **Description – Most Likely Reasonable Consequence (Probability)** |
| **Almost certain** | Consequence is expected to occur. Same is known to have occurred previously for the same work environment, task, controls and circumstances. |
| **Likely** | Consequence is likely to occur without being an absolute certainty. Consequences are known to have occurred in a similar work environment, task, controls and circumstances. |
| **Possible** | Able to foresee the consequence happening but it would be unusual when factoring in controls. Limited knowledge of this consequence happening under similar work environment, task, controls and circumstances. |
| **Unlikely** | Low chance of consequence happening but not inconceivable. For the consequence to happen it would require multiple failures of systems and or controls. |
| **Rare** | Extremely low chance of consequence happening i.e. not reasonably expected to occur. No knowledge of this consequence happening under similar work environment, task, controls and circumstances. Would require a combination of factors for the consequence to occur. |

Table 5: KRES Risk Consequence Criteria

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| **CONSEQUENCE** |
| **Consequence Criteria** | **1. Insignificant** | **2. Minor** | **3. Moderate** | **4. Major** | **5. Critical** |
| **Health & Safety** | Injury requiring first aid treatment only. | MTI or RWI classification. Injury requires medical treatment by qualified practitioner. | LTI classification. Injury may require hospitalisation, not life-threatening. | Single Fatality. Or Permanent & significant disabling injury or illness | Multiple Fatalities: or Multiple & significant disabling injuries or illnesses |
| **Environment** | Near-source confined and promptly reversible impact (Remediation is typically within the shift). | Near-source confined and short-term reversible impact. (Remediation is typically within a week). | Near-source confined and medium-term recovery impact. (Remediation is typically within a month). | Impact that is unconfined and requires long-term recovery, leaving residual damage (Remediation up to one year). | Impact that is widespread, unconfined and requires long term recovery, leaving major residual damage. (Remediation > one year). |
| **Cultural Heritage** | Low-level repairable damage to common structures or sites. No adverse impacts to CH values. | Minor damage to items of low cultural significance. Minor infringement of CH values. | Substantial damage to item of moderate cultural significance. Infringement of CH or sacred locations. | Permanent damage to items of high cultural significance. Significant infringement and disregard of CH values. | Destruction of items of high cultural significance. Highly offensive infringement of cultural values. |
| **Reputation** | Localised temporary impact. Community complaint resolved via site procedures or one-off public exposure in local media. | Localised, short term impact.Impact Significant public exposure in local media. | Localised, long term impact but manageable.Impact on reputation of KRES. Public exposure in national media. | Localised, long term impact with unmanageable outcomes. Impact on reputation of KRES. Public exposure in international media. | Long term regional impact. Severe impact on reputation of KRES.Extended exposure in international media. |
| **Legal & Compliance** | Minor non- compliance, no external attention.Minor breach of contract | Statutory non-compliance resulting in notices or external investigation.Contractual dispute that results in minor operational delay/cost | Non-Compliance with statutory notices. Investigation resulting in show cause, on-the-spot or summary fine or penalty.Litigation at operational level. | Material litigation or formal prosecution resulting in financial penalty and moderate project/operational impact. | Successful prosecution resulting in conviction or suspended / severely reduced operations imposed or severe effect on the licence to operate. |
| **Financial** | Cost up to 5% of value of asset or contract. | Cost 6% - 10% of value of asset or contract. | Cost 11% - 15% of value of asset or contract. | Cost 16% - 20% of value of asset or contract. | Cost > 20% of cost of asset or contract. |
| **Schedule & Production** | Negligible delays (1-3 days). 0%-2.5% underachievement of budget performance | Moderate delays (4-6 days). 2.5%-5% underachievement of budget performance | Material delays 7-10 days. 6%-10% underachievement of budget performance | Significant delays (11-14 days). 10%-20% underachievement of budget performance. | Major delays (>14 days). >20% underachievement of budget performance. |

Table 6: Risk Acceptability and Sign-off Criteria

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| **Acceptability Criteria** |
| **Risk Ranking** | **Description / Action Required** | **Authority Required** |
| **Very HighVH17-VH25** | **Intolerable**Exposure cannot be justified. Activity must be stopped immediately until action to reduce level of risk is undertaken. | Site Senior Executive |
| **HighH10-H16** | **Focussed and Continual Management to Make ALARP**Risk borders on tolerant to in-tolerant level. Includes risks for which proactive actions have been taken but further risk reduction is not practical. Active monitoring is required for all High-level risks. The aim is to manage risks to a Medium level wherever possible. | Manager/Superintendent |
| **MediumM6-M9** | **Tolerable if Managed**Risk is tolerable if there are established controls in place and monitoring completed specific to risk. | Supervisor |
| **LowL1-L5** | **Generally Acceptable**Risk is generally acceptable and is managed and monitored as part of work routines | All mine workers |