

## RIO TINTO

### HSEQ Qualitative Risk Analysis (Level 2) - Workshop Record Sheet

Version 4 - Issued 20/05/2021

#### Notes and Instructions

This workbook is for use during a HSEQ risk assessment workshop setting while performing a Qualitative Risk analysis (Level 2 assessments).

It is intended to be used by the scribe / facilitator to record core risk assessment information. This information may be used for future communication, reference, or transcribing to the business HSEQ risk register.

Complete the "**Scope of Assessment**" to assist in planning the risk assessment and to set the scene for the assessment participants.

The "**Risk Assessment**" is used to record the relevant risk analysis information.

The black coloured worksheets outlined some of the Rio Tinto defined fields. These sheets can be printed prior to the assessment and used as handouts.



## HSEQ Qualitative Risk Analysis (Level 2)

- Scoping and Planning Tool

<b>Workshop Topic</b>	P-2100220 Bore Field Remediation Project
<b>Date</b>	23/11/2022
<b>Work Area Description</b>	Gove Bore Fields 4/4 Area
<b>Team Members</b>	Aidan Bunn, Zac Keogh, Jade Dean, Andre Endress, John Carter, Ben Hall, Luke Atkinson, Joshua Stretton
<b>Facilitator</b>	Aidan Bunn

### Part A - Scoping the Assessment

<b>What Has "Triggered" the risk Assessment:</b>	Project Execution Phase - Ben Hall Construction
<b>Objectives:</b>	Assess and mitigate risks associated with execution of P-2100220 project remaining SMP works and asbestos removal works by Ben Hall Construction (BHC)
<b>Scope &amp; Boundaries:</b>	Removal of 12 x Bores and removal of approximately 2250m of asbestos pipe in Areas 1, 2 & 3
<b>Stakeholders and Risk Assessment Team:</b> Who will be in the risk assessment team?	RTAG Officers as shown above BHC Officers as shown above
<b>Timing:</b>	08:30 - 10:15, Wednesday 23/11/22 in conjunction with discussions around methodologies
<b>Venue:</b> Where will the risk assessment be conducted?	RTA Gove - Capital Delivery Downstairs Meeting Room + Microsoft Teams
<b>Input Information:</b> Describe the key information likely to be required to complete the risk assessment(e.g. incident reports, procedures, SWP's etc.	Methodologies, Stakeholder Knowledge & Experience, RTAG GPMs
<b>Describe any key Safety Regulations and procedures that need to be considered:</b> eg. Legislation and Regulations, Standards, Management plans, OH&S Practices / Policies, Codes of Practice, Manufacturer Instructions, OEM Manuals	Asbestos Removal Licence & NT Worksafe Requirements RTAG Standards and GPMs NT Work Health and Safety Act 2011 NT Work Health and Safety Regulations 2011 NT Worksafe - How to Safely Remove Asbestos – Code of Practice NT Worksafe - How to Manage and Control Asbestos in the Workplace – Code of Practice
<b>Does the team have an understanding of the Risk Management Process?</b>  - What training or information may be required.	Yes

LEVEL 2 RISK ASSESSMENT TOOL

Date	23/11/22	Area	RTAG Capital Projects			Name			P-2100220 - Bore Field Remediation Project				
		Team	Aidan Bunn, Zac Keogh, Jade Dean, Andre Endress, John Carter, Ben Hall, Luke Atkinson, Joshua Stretton										

Part B - Conducting a Risk Assessment

Work Area	Hazard / Aspect	Risk Scenario	Causes	Existing Controls	Current Risk			Planned Controls / actions	Predicted Risk			Actions	Comments / Rationale	
					Consequence	Likelihood	Risk Rating		Consequence	Likelihood	Risk Rating			
Example: Eastern sea water channel	Removal of cable tray	Objects falling from height whilst removing cable tray	Load not secure, incorrect lifting technique, equipment failure	Use of correct lifting technique, use of correct equipment and current tested & tagged, inspection of cable tray for integrity, exclusion zones	3-Serious	D-Unlikely	Moderate	Secure existing cable tray, JSEA, using dogger & rigger, development of lifting plan, determination of correct lifting requirements & techniques, rescue plans, possible hot work required to assist in securing cable tray	3-Serious	D-Unlikely	Moderate	By Whom	When	
Project Risk	Change in scope of work	Risk not identified	Procedure not followed	GPM-EHS-001 Risk Management Procedure	3-Serious	C-Possible	C-Possible e3-Serious High	All scope change initiates risk review and amend this document	2-Medium	D-Unlikely	D-Unlikely2-Medium Low			
Project Risk	Community trust	Outages occurring without due warning to residents	Isolations without effective communications	Communication via RTAG community liaison personnel Follow Rio Tinto guidelines for Water Outages to town	3-Serious	C-Possible	C-Possible e3-Serious High	Construction Leader to provide timely and accurate information to RTAG community liaison personnel	3-Serious	D-Unlikely	D-Unlikely3-Serious Moderate			
Project Risk	BHC Materials Supply	Materials damaged during transport or execution	Human error	Transport, handling, human, manufacturing errors	3-Serious	C-Possible	C-Possible e3-Serious High	Where reasonable, procure spares	3-Serious	D-Unlikely	D-Unlikely3-Serious Moderate			
Project Risk	Competition for contractor resources	Insufficient personnel to maintain progress works	Additional workload for other clients	BHC to confirm Manning Plan and confirm agreement with overall schedule baseline	3-Serious	C-Possible	C-Possible e3-Serious High	Regular discussions between RTAG & BHC regarding upcoming demands (eg weekly meeting)	3-Serious	D-Unlikely	D-Unlikely3-Serious Moderate			
Project Risk	Design specs not met	Asbestos contamination in area Reduced ability to mine to depth	Human error	IFC drawings Asbestos Hygienist COC	3-Serious	C-Possible	C-Possible e3-Serious High	CL to witness bore depth Agon Hygienist to provide clearance certificate	3-Serious	D-Unlikely	D-Unlikely3-Serious Moderate			
Project Risk	Contamination of bauxite ore body	Reduced product quality	Uncontrolled excavation	See methodology	3-Serious	C-Possible	C-Possible e3-Serious High	Separate overburden from bauxite	3-Serious	D-Unlikely	D-Unlikely3-Serious Moderate			
Project Risk	Asbestos	People exposed to asbestos fibre	Untrained & unfamiliar with asbestos works. Unlicensed vendor	BHC to work under A&R licence for FY22 works	4-Major	C-Possible	C-Possible e4-Major Critical	RTAG to receive evidence of BHC certificate once received in Jan'23. Agon Hygienist will be monitoring work area	2-Medium	D-Unlikely	D-Unlikely2-Medium Low			
BHC Mobilisation	Banned and restricted tool list	Harm to personnel or equipment	Human error Procedures not followed	FRM-EHS-063 Banned restricted tool list	3-Serious	D-Unlikely	D-Unlikely y3-Serious Moderate	Test and tag register on all rigging and electrical equipment	2-Medium	E-Rare	E-Rare2-Medium Low			
BHC Mobilisation	Operating vehicles	New vehicle to site not compliant	Unauthorised site access procedure not followed	Site inspection of vehicle FRM-EHS-298 Daily vehicle inspections	3-Serious	C-Possible	C-Possible e3-Serious High	PUN Vehicles for site compliance VEOP	3-Serious	D-Unlikely	D-Unlikely3-Serious Moderate			
BHC Mobilisation	Transporting vehicles	Unauthorised access HV hazards Non-weight bearing surfaces Restricted road access Road conditions	Unauthorised access Procedures not followed	Operations authorised access procedure	3-Serious	D-Unlikely	D-Unlikely y3-Serious Moderate	Transport route plan that identifies inherent hazards of the safest route to the construction sites Update Traffic Management Plan to suit	3-Serious	E-Rare	E-Rare3-Serious Moderate			
BHC Mobilisation	Transporting vehicles	Vehicle roll over-loss control of vehicle Vehicle collision	Unlevel ground Unstable ground Vehicle traffic HV hazards Non-weight bearing surfaces Restricted road access Road conditions	GPM-EHS-027 Vehicles and driving CRM	2-Medium	C-Possible	C-Possible e2-Medium Moderate	TMP Implement applicable CCC's Reviewed JSEA RTHA Take 5	2-Medium	E-Rare	E-Rare2-Medium Low			
BHC Mobilisation	Field communication	No VHF radio Unable to contact No mobile reception Unable to initiate emergency response	Procedure not followed	Site induction Area Induction	3-Serious	C-Possible	C-Possible e3-Serious High	Address issue of site tuned radios at the L2RA review. BHC have their own VHF & UHF radios and own UHF operating frequency	2-Medium	D-Unlikely	D-Unlikely2-Medium Low			
BHC Mobilisation	Loaded truck interaction	Vehicle impact on person	Pedestrians interacting with vehicles	Authorised access CRM	3-Serious	D-Unlikely	D-Unlikely y3-Serious Moderate	Trucks parked fundamentally stable. Barricade loading area to prevent unauthorised entry Implement applicable CCC's	2-Medium	D-Unlikely	D-Unlikely2-Medium Low			
BHC Mobilisation	Lifting Loads	Falling objects Unsecure load Cushing impact on person Striking impact on person	Unstable load Unlevel ground Unstable load Unlevel ground Unsecure rigging Insufficient rigging Unstable load Unstable crane Loose structures Overhead Unstable ground Inadvertent movement of crane Personnel in fall zone	GPM-EHS-027 Vehicles and driving GPM-EHS-071 Cranes and Lifting GPM-EHS-104 Site Temporary Barricading and Demarcation CRM	4-Major	C-Possible	C-Possible e4-Major Critical	Lead restraint to site standards to prevent inadvertent movement. Reviewed JSEA Take 5	3-Serious	D-Unlikely	D-Unlikely3-Serious Moderate			

**LEVEL 2 RISK ASSESSMENT TOOL**

Date	23/11/22	Area	RTAG Capital Projects		Name	P-2100220 - Bore Field Remediation Project			
		Team	Aidan Bunn, Zac Keogh, Jade Dean, Andre Endress, John Carter, Ben Hall, Luke Atkinson, Joshua Stretton						

**Part B - Conducting a Risk Assessment**

Work Area	Hazard / Aspect	Risk Scenario	Causes	Existing Controls	Current Risk				Planned Controls / actions	Predicted Risk				Actions	Comments / Rationale
					Consequence	Likelihood	Risk Rating	Risk Rating		Consequence	Likelihood	Risk Rating	Risk Rating		
BHC Mobilisation	Transporting loads	Load contacting hazard	Over head hazards Over confidence Hazard unknown Distance to overhead hazard Unstable load Unevel ground	GPM-EHS-027 Vehicles and driving GPM-EHS-045 High Voltage CRM	4-Major	C-Possible	C-Possibl e4- Major	Critical	Route of the load to be planned to identify and eliminate any overhead hazards. Where hazards exist the plan shall document the height of the hazard for the purposes of transportation. RTHA Take 5 Implement applicable CCC's Reviewed JSEA	3-Serious	D-Unlikely	D-Unlikely3- Serious	Moderate		
BHC Mobilisation	Inefficient communications with area owners	Interaction with HME	Lack of RT tuned VHF radios / uncharged battery	Mine compound training	4-Major	C-Possible	C-Possibl e4- Major	Critical	RTAG to supply minimum of 4 radios + chargers (spare batteries?)	4-Major	D-Unlikely	D-Unlikely4- Major	High		
Site setup	Work Area Environment	Obstructions to plant and personnel, Slips trip & falls. Interaction with work groups, Workers unaware of daily site activities, Contacting services in the ground, Unauthorised Access	Uneven ground Unstable ground Vague/poor work guidance Poor communications Over confidence	CRM Toolbox work direction GPM-EHS-027 Vehicles and driving Banners CRM	3-Serious	B-Likely	B- Likely3- Serious	High	Daily work direction Plant layout plan Communications plan for Banners and external comms TMP RTHA Take 5 Implement applicable CCC's Reviewed JSEA	2-Medium	D-Unlikely	D-Unlikely2- Medium	Low		
Site setup	Vehicle movements	Vehicle impact on person	Pedestrians interacting with vehicles Public driving behaviour	TMP GPM-EHS-027 Vehicles and driving CRM	3-Serious	C-Possible	C- Possibl e3- Serious	High	TMP Delineation. Exclusion zones Area segregation Authorised access via radio positive communication Implement applicable CCC's Reviewed JSEA Take 5 First point of call 000	3-Serious	D-Unlikely	D-Unlikely3- Serious	Moderate		
Site setup	Vehicle movements	Vehicle roll over-loss control of vehicle Vehicle collision	Unevel ground Unstable ground Public driving behaviour Vehicle traffic HV hazards Non-weight bearing surfaces Restricted road access Road conditions	GPM-EHS-027 Vehicles and driving CRM	2-Medium	C-Possible	C- Possibl e2- Mediu m	Moderate	RTHA TMP Implement applicable CCC's Reviewed JSEA Take 5 First point of call 000	2-Medium	D-Unlikely	D-Unlikely2- Medium	Low		
Site setup	Power generation	Electrocution	Uncontrolled release Non-compliant unsafe equipment	GSM-ENG-4204-900 Compliance Portable generator/welder check sheet using CRK-EWS-005 PUN Inspections Electrical Awareness Induction 3 monthly TEST & TAG compliance Projects asset register CRM	3-Serious	C-Possible	C- Possibl e3- Serious	High	All generators PUN for the purposes of site compliance. Supervisor to manage records of generator inspections. Asset register to be reviewed weekly by construction manager. Implement applicable CCC's Reviewed JSEA Take 5	2-Medium	D-Unlikely	D-Unlikely2- Medium	Low		
Site setup	Wildlife interaction	Unwanted interaction with hazards, Buffalo Snakes Spiders	Working outside fenced lease area Disturbing existing infrastructure	Nil	2-Medium	C-Possible	C- Possibl e2- Mediu m	Moderate	Inspect work areas and specify hazards for those areas and any specific controls required to mitigate the risk associated with the hazard	2-Medium	D-Unlikely	D-Unlikely2- Medium	Low		
Site setup	Natural Environment / Ecosystem	Unapproved clearing of vegetation - environmental risk	Work not planned properly. Not following site procedures.	GPM-EHS-014 VEGETATION CLEARING APPROVAL FRM-EHS-037 VEGETATION CLEARING PERMIT APPLICATION	2-Medium	C-Possible	C- Possibl e2- Mediu m	Moderate	Communicate issue on regular basis at contractor prestarts. Plan and engage early on to allow time to follow process, assess and implement controls.	2-Medium	D-Unlikely	D-Unlikely2- Medium	Low		
Site setup	Live Overhead lines	Electrocution, Power outages to town & plant	Inadvertent contact from plant equipment	High voltage access and vicinity permits, Approved methodology, CRM	3-Serious	C-Possible	C- Possibl e3- Serious	High	Required resources to complete HV access / vicinity training. Safety observer, Reviewed JSEA	2-Medium	D-Unlikely	D-Unlikely2- Medium	Low		
Road Closure Road restrictions	Uncontrolled entry	Vehicle impact on person Vehicle collision	Unauthorised entry Insufficient delineation	TMP approval GPM-EHS-027 Vehicles and driving GPM-EHS-104 Site Temporary Bancading and Demarcation Banners CRM	3-Serious	D-Unlikely	D- Unlikel y3- Serious	Moderate	Area segregation Authorised access via radio or mobile phone, positive communication CCC Reviewed JSEA	3-Serious	E-Rare	E-Rare3- Serious	Moderate		

**LEVEL 2 RISK ASSESSMENT TOOL**

Date	23/11/22	Area	RTAG Capital Projects	Name	P-2100220 - Bore Field Remediation Project		
		Team	Aidan Bunn, Zac Keogh, Jade Dean, Andre Endress, John Carter, Ben Hall, Luke Atkinson, Joshua Stretton				

**Part B - Conducting a Risk Assessment**

Work Area	Hazard / Aspect	Risk Scenario	Causes	Existing Controls	Current Risk			Planned Controls / actions	Predicted Risk			Actions	Comments / Rationale
					Consequence	Likelihood	Risk Rating		Consequence	Likelihood	Risk Rating		
Site works (General)	Hidden electrical service	Electrocution Electric shock	Contacting services in the ground Unknown services Energies from services not controlled Procedures not followed	GPM-ENG-83-07-14 Excavation Permit & Survey Request Procedure CRM Decommission procedure Isolation procedures	4-Major	D-Unlikely	D- Unlikel y4- Major High	Excavation Permit Implement applicable CCC's Reviewed JSEA Identify and visually mark survey area RTHA	4-Major	E-Rare	E-Rare4- Major High		
Site works (General)	Hidden utility service	Exposure to hazardous substance Contamination Flood	Contacting services in the ground Unknown services Energies from services not controlled Procedures not followed	GPM-ENG-83-07-14 Excavation Permit & Survey Request Procedure CRM Decommission procedure Isolation procedures	3-Serious	D-Unlikely	D- Unlikel y3- Serious Moderate	Excavation Permit General Work Permit Implement applicable CCC's Reviewed JSEA Identify and visually mark survey area RTHA	2-Medium	E-Rare	E-Rare2- Medium Low		
Site works (General)	Digging	Excavator contacting services	No excavation permit Unknown services.	GPM-ENG-83-07-14 Excavation Permit Procedure GPM-EHS-069 Permit to Work CRM	2-Medium	C-Possible	C- Possibl e2- Mediu m Moderate	Excavation permit review TMP Area segregation Authorised access via radio positive communication Implement applicable CCC's Reviewed JSEA	2-Medium	D-Unlikely	D-Unlikel y2- Medium Low		
Site works (General)	Operating vehicle	Vehicle impact on person	Pedestrians interacting with vehicles	GPM-EHS-027 Vehicles and driving GPM-EHS-104 Site Temporary Barmcading and Demarcation CRM	3-Serious	C-Possible	C- Possibl e3- Serious High	TMP Area segregation Authorised access via radio positive communication Two person operation. Exclusion zones Implement applicable CCC's Reviewed JSEA Take 5	3-Serious	E-Rare	E-Rare3- Serious Moderate		
Site works (General)	Cranes	Objects falling from height whilst lifting	Load not secure, incorrect lifting technique, equipment failure	Use of correct lifting technique, use of correct equipment and current tested & tagged, implement exclusion zones GPM-EHS-071 Cranes and Lifting	4-Major	C-Possible	C- Possibl e4- Major Critical	JSEA, using dogger & rtgger, determination of correct lifting requirements & techniques.	3-Serious	D-Unlikely	D-Unlikel y3- Serious Moderate		
Site works (General)	Heavy Vehicles	Interaction between heavy vehicles and personnel	Lack of exclusion and communications	Site traffic management, communications	3-Serious	C-Possible	C- Possibl e3- Serious High	JSEA, traffic management plan in place, communications with the area. Exclusion zone in place	3-Serious	D-Unlikely	D-Unlikel y3- Serious Moderate		
Site works (General)	Uncontrolled release of energy	Line of fire	Procedure not followed Poor body position Incorrect tool for task	Snap back zones Equipment inspections Bores have been decommissioned and certificates are on hand	3-Serious	C-Possible	C- Possibl e3- Serious High	RTHA SMP Implement applicable CCC's Reviewed JSEA Take 5	3-Serious	D-Unlikely	D-Unlikel y3- Serious Moderate		
Site works (General)	Working at Height	Fall	Incorrect operation	WAH VEOP, Harness, JSEA, GPM-EHS-062	4-Major	D-Unlikely	D- Unlikel y4- Major High	WAH VEOP, Harness, JSEA, Spotter	3-Serious	E-Rare	E-Rare3- Serious Moderate		
Site works (General)	Cultural Heritage	Damage to site or item of cultural significance occurs.	Procedure not followed	Cultural heritage permit, GPM-CAF-005	3-Serious	D-Unlikely	D- Unlikel y3- Serious Moderate	Communicate issue on regular basis at contractor prestarts.	2-Medium	D-Unlikely	D-Unlikel y2- Medium Low		
Site works (General)	Natural Environment / Ecosystem, Wildlife interaction.	Potential disruption of nesting birds.	Procedure not followed. Lack of communication. Poor job planning	GPM-EHS-119 Management of injured fauna and fauna affected by operations	2-Medium	C-Possible	Possibl e2- Mediu m Moderate	Engage HSE and work to the Site procedures. Communicate issue on regular basis at contractor prestarts.	2-Medium	D-Unlikely	D-Unlikel y2- Medium Low		
Site works (General)	Inclement weather	Lightning Rain Wind. Effects of rain on safe work. Effects of wind on safe work.	Lightning Rain Wind.	GPM-EHS-088 "Lightning" CRM	4-Major	C-Possible	C- Possibl e4- Major Critical	Use of appropriate GPM Contractors standard procedures for managing inclement weather conditions	3-Serious	E-Rare	E-Rare3- Serious Moderate		
Site works (General)	Public interaction	Interaction with plant equipment Electrocution Falling objects	Insufficient signage & segregation Procedures not followed Poor communication with community	GPM-EHS-104 Site Temporary Barmcading and Demarcation Community notifications CRM	4-Major	C-Possible	C- Possibl e4- Major Critical	Regular reviews Implement applicable CCC's Reviewed JSEA	3-Serious	E-Rare	E-Rare3- Serious Moderate		
Site works (General)	Unplanned Burn offs	Fire encroaching within battery limits of construction works	Traditional burn offs of vegetation	Fire safety inductions Visual inspections of surround vegetation conditions before commencement of work	2-Medium	C-Possible	C- Possibl e2- Mediu m Moderate	Establish muster point Roll call Advise ERT/Construction leads	2-Medium	E-Rare	E-Rare2- Medium Low		
Site works (General)	Mine interaction	Unforeseen interaction with mine activities	Person unfamiliar with mining activities	Mine compound training required Pit passes required for driving in the mine area	3-Serious	D-Unlikely	D- Unlikel y3- Serious Moderate						
Site works (General)	Waste Disposal	Spillage in mine area or public road	Waste inadequately secured	Ensure that loads are secure and tarped	2-Medium	C-Possible	C- Possibl e2- Mediu m Moderate						
Site works (General)	Unauthorised access to mine area	Vehicle to vehicle collision	Interaction with Mine equipment	Mine compound induction	4-Major	C-Possible	C- Possibl e4- Major Critical	Pit permit	4-Major	D-Unlikely	D-Unlikel y4- Major High		

**LEVEL 2 RISK ASSESSMENT TOOL**

Date	23/11/22	Area	RTAG Capital Projects		Name		P-2100220 - Bore Field Remediation Project			
		Team	Aidan Bunn, Zac Keogh, Jade Dean, Andre Endress, John Carter, Ben Hall, Luke Atkinson, Joshua Stretton							

**Part B - Conducting a Risk Assessment**

Work Area	Hazard / Aspect	Risk Scenario	Causes	Existing Controls	Current Risk				Planned Controls / actions	Predicted Risk				Actions	Comments / Rationale
					Consequence	Likelihood		Risk Rating		Consequence	Likelihood		Risk Rating		
Site Works - Bore Removal	Deep Excavation	Fall	Attempting to identify bore well depth	GPM-EHS-062. Do not approach closer than 2m to a 1.8m drop	3-Serious	B-Likely	B-Likely3-Serious	High	Use tape measure or string on excavator bucket to check bore well depth	3-Serious	D-Unlikely	D-Unlikely3-Serious	Moderate		
Site Works - Bore Removal	Deep Excavation	Fall	Unauthorised entry Insufficient delineation	Area will be danger taped with tags prohibiting any non authorised people to enter the area	3-Serious	D-Unlikely	D-Unlikely y3-Serious	Moderate							
Site Works - Bore Removal															
Site Works - Bore Removal															
Site Works - Bore Removal															
Site Works - Asbestos	Fatigue	Mistakes, incident	Working night shift	GPM-EHS-126. Fatigue Management Procedure	3-Serious	C-Possible	C-Possible e3-Serious	High	Consultation with HSE and proposed roster / risk assessment approved	3-Serious	D-Unlikely	D-Unlikely3-Serious	Moderate		
Site Works - Asbestos	Asbestos	Exposure	Dust generated from impact / breakage of pipe	GPM-EHS-038 - Asbestos Management Mobile plant will have air filtration system retrofitted	3-Serious	C-Possible	C-Possible e3-Serious	High	Water sprays used to control dust. Full asbestos PPE. Trained & authorised Supervision Trained Operators *Asbestos* work area barricaded	3-Serious	D-Unlikely	D-Unlikely3-Serious	Moderate		
Site Works - Asbestos	Asbestos	Exposure	Plastic wrapping damaged	Tarpaulines used to secure containment of asbestos pipe located within quarantine area	3-Serious	D-Unlikely	D-Unlikely y3-Serious	Moderate							
Site Works - Asbestos	Asbestos	Exposure	Residual asbestos	Clearance certificate to be delivered by Agon Asbestos Hygienist	3-Serious	D-Unlikely	D-Unlikely y3-Serious	Moderate							
Site Works - Asbestos	Asbestos	Exposure	Equipment contaminated	Decontamination of equipment	3-Serious	D-Unlikely	D-Unlikely y3-Serious	Moderate							
Site Works - Asbestos	Asbestos	Incident weather disrupting stored asbestos	Community exposure to asbestos	GPM-EHS-038	3-Serious	C-Possible	C-Possible e3-Serious	High	Concrete tie down blocks + geo fab cover Site approved tie down procedure Cyclone response plan	3-Serious	D-Unlikely	D-Unlikely3-Serious	Moderate		
Site Works - Asbestos	Asbestos	Asbestos fibres in plant & equipment filters	No asbestos filters	Air monitoring by Hygienist	3-Serious	C-Possible	C-Possible e3-Serious	High	Review air monitoring to determine if asbestos filters are required	3-Serious	D-Unlikely	D-Unlikely3-Serious	Moderate		
Site Works - Asbestos															
Site Works - Asbestos															
Site Works - Asbestos															
Demobilisation from site	Transporting vehicles	Vehicle roll over-loss control of vehicle Vehicle collision	Unelevel ground Unstable ground Vehicle traffic HV hazards Non-weight bearing surfaces Restricted road access Road conditions	GPM-EHS-027 Vehicles and driving CRM	2-Medium	C-Possible	C-Possible e2-Medium	Moderate	TMP Implement applicable CCC's Reviewed JSEA RTHA Take 5	2-Medium	D-Unlikely	D-Unlikely2-Medium	Low		







Consequence	1-Minor	2-Medium	3-Serious	4-Major	5-Catastrophic
Likelihood					
A-Almost certain	Moderate	High	Critical	Critical	Critical
B-Likely	Moderate	High	High	Critical	Critical
C-Possible	Low	Moderate	High	Critical	Critical
D-Unlikely	Low	Low	Moderate	High	Critical
E-Rare	Low	Low	Moderate	High	High

Rating	Class	Risk management response
Critical	Class IV	Risks that significantly exceed the risk acceptance threshold and need urgent and immediate attention.
High	Class III	Risks that exceed the risk acceptance threshold and require proactive management. Includes risks for which proactive actions have been taken, but further risk reduction is impracticable. However active monitoring is required and the latter requires the signoff by Business Unit senior management.
Moderate	Class II	Risks that lie on the risk acceptance threshold and require active monitoring. The implementation of additional measures could be used to reduce the risk further.
Low	Class I	Risks that are below the risk acceptance threshold and do not require active management. Certain risks could require additional monitoring.

Consequence	MINOR	MEDIUM	SERIOUS	MAJOR	CATASTROPHIC
<b>Non-Economic (Social and Environmental)</b>					
<b>HEALTH</b>	Reversible health effects of little concern, requiring first aid treatment at most.  Can include minor irritations of eyes, throat, nose and/or skin, or minor unaccustomed muscular discomfort.	Reversible health effects of concern that would typically result in medical treatment.  Can include temperature effects; travel effects; stress; and sunburn.	Severe, reversible health effects of concern that would typically result in a lost time illness.  Can include acute / short-term effects associated with extreme temperature effects; or musculo-skeletal effects; vibration effects; nervous system effects; some infectious diseases; and non falciparum malaria.	Single fatality or irreversible health effects or disabling illness.  Can include effects of suspected carcinogens, mutagens, teratogens and reproductive toxicants, progressive chronic conditions and/or acute / short-term high-risk effects	Multiple fatalities or serious disabling illness to multiple people.  Can include effects of known human carcinogens, mutagens, teratogens and reproductive toxicants, and life-threatening respiratory sensitization and falciparum malaria
<b>SAFETY</b>	Low level short term subjective inconvenience or symptoms.  Typically a first aid and no medical treatment.	Reversible injuries requiring treatment, but does not lead to restricted duties.  Typically a medical treatment.	Reversible injury or moderate irreversible damage or impairment to one or more persons.  Typically a lost time injury.	Single fatality and/or severe irreversible damage or severe impairment to one or more persons.	Multiple fatalities or permanent damage to multiple people.
<b>ENVIRONMENT (on site)</b>	Near-source confined and promptly reversible impact  (Typically a shift)	Near-source confined and short-term reversible impact  (Typically a week)	Near-source confined and medium-term recovery impact  (Typically a month)	Impact that is unconfined and requiring long-term recovery, leaving residual damage  (Typically years)	Impact that is widespread-unconfined and requiring long-term recovery, leaving major residual damage  (Typically years)
<b>ENVIRONMENT (off site)</b>	Not applicable	Near-source confined and promptly reversible impact  (Typically a shift)	Near-source confined and short-term reversible impact  (Typically a week)	Near-source confined and medium-term recovery impact  (Typically a month)	Impact that is unconfined and requiring long-term recovery, leaving residual damage  (Typically years)
<b>COMMUNITY (community trust)</b>	Tangible expressions of trust / mistrust amongst a handful of community members with no influence on public opinion and decision-makers.	Tangible expressions of trust / mistrust amongst a few community members with some influence on public opinion and decision-makers.	Tangible expressions of trust / mistrust amongst some community members with moderate influence on public opinion and decision-makers.	Tangible expressions of trust / mistrust amongst most community members with significant influence on decision-makers.	Widespread loss / gain of trust across the community setting the agenda for decision-makers and key stakeholders.
<b>COMMUNITY (stakeholder relationship)</b>	Key stakeholder(s) express support / dissatisfaction informally.	Key stakeholder(s) express support / dissatisfaction formally.	Key stakeholder(s) threaten to oppose or disengage / strengthen offers to support or engage.	Key stakeholder(s) actively oppose or actively refuse to engage / actively support and engage.	Key stakeholder(s) oppose and actively get others to oppose / engaged and actively get others to support.
<b>COMMUNITY (cultural heritage)</b>	Reparable damage to site or item of low cultural significance occurs/avoided.	Irreparable damage to site or item of low cultural significance occurs/avoided.	Repairable damage to site or item of cultural significance occurs/avoided.	Irreparable damage to site or item of cultural significance occurs/avoided.	Irreparable damage to site or item of international cultural significance occurs/avoided.
<b>REPUTATION</b>	Community complaint resolved via existing site procedures. Impact on reputation of several work areas within an operation.  One off public exposure in local media, word of mouth or local mythologies.	Impact on reputation of Business Unit.  Significant public exposure in local media.	Impact on reputation of Product Group.  Comment from national NGO which impacts credibility with neighbours/regional government.  Public exposure in national media.	Impact on reputation of Rio Tinto Group.  Comment from international NGO.  Public exposure in international media.	Severe impact on reputation of Rio Tinto Group.  Severe prolonged comment from international NGO.  Greater than three years public exposure in international media.
<b>CONFORMANCE / COMPLIANCE</b>	Non-conformance with internal requirement with very low potential for impact.  Non-compliance with external / community commitment goes unnoticed by external party/parties, requiring minimal effort to correct.	Non-compliance with external or non conformance with internal requirement with low potential for impact.  Non-compliance with community commitment, requiring limited effort to correct.	Non-compliance with external or non conformance with internal requirement with moderate potential for impact.  Moderate penalties for breach of legislation, contract, permit or licence.  Non-compliance with community commitment reported formally, requiring significant effort to correct.	Breach of licences, legislation, regulation or repeated non-compliance with high potential for prosecution.  Breach of contract with significant penalty clauses imposed.  Systemic non-conformance with Rio Tinto work cycles or standards with high potential for impact.	Suspended or severely reduced operations imposed by regulators.  Breach of community commitment results in direct loss of established consents with widespread secondary effects.
<b>Economic Consequence types (Operational)</b>					
<b>Capital Costs</b>	< 1.6%	1.6% - 5%	5% - 10%	10% - 30%	> 30%
<b>Schedule</b>	< 2.5%	2.5% - 7.5%	7.5% - 15%	15% - 45%	> 45%
<b>Operation &amp; Maintenance Costs</b>	< 0.6%	0.6% - 2.5%	2.5% - 7.5%	7.5% - 15%	> 15%
<b>Production Volumes</b>	< 0.6%	0.6% - 2.5%	2.5% - 7.5%	7.5% - 15%	> 15%
<b>Business Unit Revenue</b>	< 0.25%	0.25% - 1%	1% - 3.5%	3.5% - 7%	> 7%

Likelihood	Likelihood description	Frequency	Substance Exposure
ALMOST CERTAIN	Recurring event during the life-time of an operation / project	Occurs more than twice per year	Frequent (daily) exposure at > 10 x OEL
LIKELY	Event that may occur frequently during the life-time of an operation / project	Typically occurs once or twice per year	Frequent (daily) exposure at > OEL
POSSIBLE	Event that may occur during the life-time of an operation / project	Typically occurs in 1-10 years	Frequent (daily) exposure at > 50% of OEL Infrequent exposure at > OEL
UNLIKELY	Event that is unlikely to occur during the life-time of an operation / project	Typically occurs in 10-100 years	Frequent (daily) exposure at > 10% of OEL Infrequent exposure at > 50% of OEL
RARE	Event that is very unlikely to occur during the life-time of an operation / project	Greater than 100 year event	Frequent (daily) exposure at < 10% of OEL Infrequent exposure at > 10% of OEL

<b>HazardType</b>
<b>Biological</b>
<b>Climatic / Natural Events</b>
<b>Electrical / Magnetic</b>
<b>Ergonomics</b>
<b>External Threats</b>
<b>Gravity</b>
<b>Lighting</b>
<b>Natural Environment / Ecosystem</b>
<b>Mechanical</b>
<b>Personal / Behavioural</b>
<b>Pressure</b>
<b>Radiation</b>
<b>Social / Cultural</b>
<b>Sound / Vibration</b>
<b>Substances</b>
<b>Thermal / Fire / Explosion</b>
<b>Vehicles and Transportation</b>
<b>Waste</b>
<b>Work Environment</b>

# HSEQ Hazard Type Definitions

## Definition

Potential for harm caused by exposure to biological hazards, including flora (plants) and fauna (animals), and various specific sub-classes of agents.

Potential for harm or damage to person or equipment/ assets resulting from exposure to extreme natural, environmental or climatic sources and events such as weather (e.g. lightening, high winds, flooding).

Potential for contact with or close exposure to electrical or magnetic energy sources which could cause harm to person, equipment/assets or the environment.

Potential for exposure to physical actions or forces, including poor design: presenting the potential for harm associated with exertion, excessive, unnatural or repetitive movement; poor posture or other undesired physical stress on the human body.

Potential for harm resulting from an external source or events (i.e. outside of the operations direct control). This may be utilized to include restrictive legislative or governmental actions, contributing to a compliance risk.

Potential for a person, object or structure, subject to its weight or momentum to fall, move unexpectedly or be otherwise subject to uncontrolled gravitational forces.

Potential for harm to result from overexposure to light or the presence of inadequate lighting in the workplace

Potential to harm or degrade the natural environment or ecosystem due to use / consumption of natural resources or as a result of operating activities.

Potential for unexpected or unintended interaction with sources of mechanical energy; including equipment and uncontrolled forces or movement with the potential to cause harm to person, equipment/assets or the environment.

Potential for harm to persons (themselves or others) and equipment/assets associated with undesired behavioural actions, stresses or stressors.

Potential for harm resulting from the sudden release of pressure from a specific source.

Potential for harm to result from exposure to or contact with radiation waves from either natural or manufactured sources (characterised as either ionising or non-ionising sources).

Where there is potential for an element of a business' activities to negatively (or positively) interact with social or cultural expectations leading to a localised impact

Potential for harm resulting from prolonged exposure to excessive noise or vibration.

Potential for harm to occur as a result of unexpected or unintended exposure to physical materials or chemicals whose properties are normally controlled. Substances are grouped under attributes associated with their most common reactivity.

Potential for harm or damaging forces from contact with or variation in temperature (Hot or Cold) energy. This includes fires which may be sourced from any flammable material (solid, powder, liquid or gas). Explosions may be defined as a sudden pressure

Potential for harm (including property damage) to result from the operation of self-propelled equipment - typically related to a heavy or fast moving impact or collision.

Potential for harm caused by the inappropriate use of resources or inadequate management or disposal of waste material.

Potential for harm to result from physical hazards associated with workplace conditions or a specific physical location.

# HSEQ Hazard Type / Hazard Description (Sub-Type)

Vehicles/transportation
Aircraft
Ancillary Equipment
Bicycle / cyclist
Cranes
Draglines
Earthmoving equipment
Hazardous material transport
Heavy Vehicles
Light/Medium Vehicles
Marine Vessels / Ships
Mining Equipment
Molten metal transport
Motorcycles
Remote controlled equipment
Small Boat / Watercraft
Stackers / reclaimers
Trains

Mechanical
Crushing
Cutting or Severing
Grinding
Impact
Mass and Stability
Mass and Velocity
Mechanical Strength
Moving Equipment
Pinch Points
Projectile
Puncturing
Roll-Over
Rotating Equipment
Stored Energy
Vacuum
Wearing / Scraping

Pressure
Air (eg. Tyres)
Artesian
Ground
Hydraulic
Hydrostatic
Inrush
Mechanical
Pneumatic
Steam
Wind Blast

Gravity
Bench Stability
Dump Stability
Fall at Level
Fall from Height
Fall into Depths
Falling Load
Falling Object / Material
High Wall / Low Walls Stability
Roll Away
Roll Over
Slope Stability
Underground strata stability

Lighting
Glare
High Level
Low Level

Work Environment
Confined Spaces
Dry Conditions
Fixed Object
Housekeeping
Inadequate System Design
Pedestrians
Remote Activities / Isolation
Travel Health
Uneven or Broken Ground
Ventilation
Wet / Slick / Slippery Conditions

Sound / Vibration
Noise (Community Issue)
Noise (Continuous)
Noise (Impact)
Vibration (Community issue)

Thermal/Fire/Explosion
Ambient Heat
Cold Stress
Contact - Cold Gas
Contact - Cold Liquid
Contact - Cold Surface
Contact - Hot Gas
Contact - Hot Liquid
Contact - Hot Surface
Explosion - Dust
Explosion - Gas
Explosion - Mine
Explosion - Molten Material
Explosion - Underground
Extreme Cold
Extreme Heat
Fire - Surface - Fixed Plant
Fire - Surface - Mobile Plant
Fire - Underground - Fixed Plant
Fire - Underground - Mobile Plant
Heat Stress
Microwave
Molten Materials
Radiant Heat
Spontaneous Combustion

Electrical / Magnetic
AC <110 Volts
AC 110-480 Volts
AC 240 Volts
AC 50 Volts
Arc Flash
Control Systems
DC <24 Volts
DC 110 Volts
DC 240 Volts
DC Earth Leakage
DC Open Circuit
DC Short Circuit
High Voltage (>480 Volts)
Induced current
Loss of Power
Low Voltage
Magnetic Fields - Geomagnetic
Magnetic Fields Intensity
Static Electricity

Ergonomics
Bending/Twisting
Hand Tool Use
Load Handling
Pushing and Pulling
Repetitive Motion Actions
Vibration - Hand/Arm
Vibration - Whole Body
Work Area Design

External Threats
Arson
Bomb
Civil Unrest
Landmines
Political Unrest
Sabotage
Unauthorised Entry onto Site
War

Social / Cultural
Changes in Legal Systems
Cultural Heritage - Culture
Cultural Heritage - Sites
Discrimination
Economic / Community & Social Governance Capital
Economic / Community Rights
Economic / Human Capital
Economic / Livelihood - Financial Capital & Productive Activities
Economic / Natural Capital
Employment
Land & Infrastructure - Access
Land & Infrastructure - Acquisition
Relationships - Community Groups
Relationships - Government
Relationships - Media
Relationships - Non-government Organisations (NGOs)
Stakeholder Expectations
Subsistence and resource utilization

Biological
Algae
Avian Flu
Bacteria
Blood Products
Bodily Fluid
Faecal Biota
Flora
Flora Weed
Fungi
HIV/AIDS
Insects / spiders
Legionella
Livestock
Marine Life
Micro-organisms - non-specific
Parasites
Rodents
Sharps
Viruses
Wildlife

Climatic / Natural Events
Avalanche
Blizzard
Cyclones / Hurricanes / Typhoons
Drought
Earthquake
Fire - Bushfire/Wildfire/Grassfire
Flood
Foggy / Misty Conditions
Hail
Ice
Landslides
Lightning
Muddy Conditions
Rain
Snow
Storms
Tornado
Tsunami
Volcanic Eruption
Volcanic event
Wind

Waste
Acid Generating Material
Base Generating Material
Biological
Clean Fill
Garden Waste
Hazardous Waste
Non Hazardous Waste
Non Specific
Office / Paper / Cardboard
Oil
Putrescible Materials
Radioactive Waste Materials
Scrap Metal
Tailings
Tyres
Water
Wood

Personal / Behavioural
Abnormal Long Work Hours
Aggressive Behaviour
Alcohol / Drug Abuse
Fatigue
Harassment
Non-adherence to policies/procedures
Reduced capacity for work - mental
Reduced capacity for work - physical
Shift Work
Stress
Violence / Crime

Natural environment/ecosystem
Dredging
Ecosystem Change
Electrical energy consumption
Erosion
Fuel consumption
Land Filling
Topography Modification
Vegetation Clearing
Water Abstraction
Waterway Diversion

## HSEQ Hazard Type / Hazard Description (Sub-Type)

Substances - Miscellaneous
Adhesives
Alumina
Alumina Fluorinated
Alumina Hydrate
Alumina Primary
Alumina Secondary
Aluminium
Aluminium Fluoride
Ammonium Sulfate
Bauxite
Bauxite Residue
Blasting Fumes
Borates Dust
Boron
Ceramic Fibres
Chemicals - Mixed
Coke
Copper Smelter Process Dust (ESP/WHB)
Copper Sulfate Pentahydrate
Cryolite (Bath)
Degreaser
Detergents
Diesel Exhaust Particulate (DP/DPM)
Diesel Exhaust Vapours
Dross
Dust - Coal
Dust - Fugitive emissions from operations
Dust - Inhalable
Dust - Organic
Dust - Respirable
Dust - Wood
Fertilizer
Fire Suppressant
Flocculant
Flotation Reagents
Flux
Grease
Green House Gas
Iron Chlorate
Iron Oxide
Kaolin
Metal Leachate (ARD)
Metallic Fumes
Mica
Molybdenum
Non Asbestos Fibrous Silicates (NAFS)
Oil Mist
Organic Vapours
Paint
Phosphate
Plastic
Poly Aromatic Hydrocarbons
Polychlorinated Biphenyls
Polychlorinated Dioxins
Polychlorinated Furans
Potassium Chloride
Potassium Hydrogen Silica
Process Slurry
Process Water
Respirable Crystalline Silica
Rubber
Saline Water
Sewage Effluent
Sodium Chloride
Sodium Ferrocyanide
Sodium Gluconate
Sodium Hydrosulfide
Sodium Metabisulfate
Sodium Sulfate
Sodium Tetraborate
Sodium Thiosulfate
Soil (contaminated)
Suspended Solids
Talc
Tar
Thiourea
Titanium Dioxide Slag
Welding Fumes
Substances - Explosives
ANFO (Ammonium Nitrate Fuel Oil Mix)
Explosives - Others
Nitroglycerine

Substances - Toxic/Poisonous
Arsenic
Arsenic Trioxide
Asbestos
Barium
Benzo(a)pyrene
Benzyl Alcohol
Beryllium
Biocides
Cadmium
Carcinogens
Chromium III
Chromium VI
Coal Tar Pitch Volatiles
Copper
Ferric Sulfate
Fluoride
Herbicide
Insecticide
Iso-cyanates
Lead
Lead Carbonate
Manganese
Mercury
Nickel
Pesticide
Reproductive Toxicants
Selenium
Silver
Sodium Bifluoride
Sodium Cyanide
Sodium Fluoride
Sulfuric Acid Mist
Thallium
Tributyl Tin
Trichloroethylene
Uranium
Vanadium
Zinc
Substances - Corrosives
Acetic Acid
Acid - Other
Ammonium Hydroxide
Brake Fluid
Calcium Hydroxide (Hydrated Lime)
Calcium Oxide (Quick Lime)
Caustic Soda
Chromic Acid
Cresylic Acid
Hydrochloric Acid
Hydrofluoric Acid
Nitric Acid
Phosphoric Acid
Sodium Carbonate
Sodium Hydroxide
Sodium Hypochlorite
Sodium Sulfide
Sulfuric Acid
Substances - Gases - Toxic
Ammonia
Arsine Gas
Carbon Monoxide
Chlorine
Fluorine
Hydrogen Cyanide
Hydrogen Fluoride
Hydrogen Sulfide
Nitrogen Dioxide
Phosgene
Sulfur Dioxide
Sulfur Trioxide
Substances - Gases - Flammable
Acetylene
Butane
Ethane
Ethylene
Hydrogen
Liquid Petroleum Gas (Propane)
Methane
Natural Gas
Propane
Volatile Organic Carbons

Substances - Flammable/Combustible Liquids
Acetone
Aviation Fuel
Benzene
Carbon Disulfide
Cyclohexane
Diesel Fuel
Ethanol
Ethyl Acetate
Ethyl Benzene
Ethylene Glycol (Coolant)
Heat Transfer Fluid
Heavy Fuel Oil
Heptane
Hexanes
Hydrocarbons
Iso-propyl Alcohol
Kerosene
Lubricant
Methyl Cyclopentane
Methyl Ethyl Ketone
Methyl Isobutyl Carbinol (MIBC)
Methyl Isobutyl Ketone
Methylated Spirits (Denatured Alcohol)
N-Butanol
N-Hexane
Nonane
N-Pentane
Octane
Oils
Paint Thinners
Paraffins -Liquid
Petrol (Gasoline)
Solvents
Toluene
Xylene
Substances - Flammable Solids
Potassium
Sodium
Sodium Hydrosulfite
Spent Cell Lining or Spent Pot Lining
Sulfur
Substances - Gases - Other
Argon
Carbon Dioxide
Chlorofluorocarbons
Cryogenic Liquids
Entonox
Heptafluoropropane
Nitrogen
Nitrogen - Liquid Cryogenic
Nitrous Oxide
Oxygen
Oxygen - Liquid Cryogenic
Per Fluorocarbons
Refrigerant Gas
Sulphur Hexafluoride
Substances - Oxidizing Agents
Ammonium Nitrate
Calcium Hypochlorite
Organic Peroxides
Ozone
Silver Nitrate
Sodium Oxalate
Trichloroisocyanuric Acid
Radiation - Ionising
Gamma / X-rays
Radioactive Dusts
Radioactive Gauges
Radon, Thoron and Decay Products
X Ray Apparatus
Radiation - Non-Ionising
Electromagnetic Radiation
Infrared
Laser
Radiofrequency & Microwave
Ultraviolet
Welding Flash

## **Compatibility Report for FRM-EHS-362b.xls**

**Run on 27/04/2021 12:00**

If the workbook is saved in an earlier file format or opened in an earlier version of Microsoft Excel, the listed features will not be available.

### **Minor loss of fidelity**

Some formulas in this workbook are linked to other workbooks that are closed. When these formulas are recalculated in earlier versions of Excel without opening the linked workbooks, characters beyond the 255-character limit cannot be returned.