



**NSW DEPARTMENT OF
PRIMARY INDUSTRIES**

IGA-003

MINE SAFETY OPERATIONS

Exploration Drilling Hazard Checklist



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Table of Contents

Identification Form	4
Hazard Identification	5
Managing Hazards Associated With Exploration Sites	5
Hazard Checklist.....	6
1. Wire Ropes	6
2. Rig modifications.....	6
3. Structural.....	6
4. Electrical	6
5. Overhead Power Lines.....	7
6. Dust; such as Silica.....	7
7. Guarding and safe procedures to prevent access to moving parts	7
8. Access	9
9. Clothing.....	9
10. Fire Protection and Prevention.....	10
11. Access tracks to and from the site	10
12. Underground Utilities.....	10
13. Electrical Energies	10
14. Lifting	11
15. Handling Procedures (Rods).....	12
16. Fitness for Work.....	13
17. Power Tools	14
18. Rig Access/Set up.....	15
19. Deep Ponds/Dams	15
20. First Aid Injuries	15
21. Operator Training.....	16
22. Induction	16
23. Weather Protection	16
24. Bunding.....	16
25. Noise.....	17
26. Site Facilities.....	17
27. General Site Safety and Security	17
28. Other	18
Induction Checklist.....	19
Feedback sheet.....	20



Identification Form

Exploration company/contracting company
reviewed in this document:

Location of drill rig or site:

Assessor(s):

Date of assessment:

Type of drill rig/unit or type of exploration:

Drill rig no./identification:

Driller/operator's name:



Hazard Identification

A hazard may be defined as a dangerous condition, either potential or inherent, which can interrupt or interfere with progress of work.

Managing Hazards Associated With Exploration Sites

Any foreseeable safety or health risk arising from carrying out operations at an exploration site and has the potential to cause significant harm to persons carrying out those operations must be identified and assessed.

Any such risk is to be eliminated, or if it is not reasonably practicable to eliminate the risk, the risk is minimised to the fullest extent utilising safe work systems.

a) Risk Assessments

Job Safety Analysis (JSA) or similar risk assessment techniques should be used for all non-routine activities to ensure hazards are identified and controlled to achieve the lowest possible risk level.

Training of personnel and providing the means to document their JSA's should be established and MEASUREs taken to ensure effective risk assessments are conducted.

As Manager of an exploration site, you must ensure risk management strategies are developed in the following areas:

- exploration site and means of access,
- drill rig,
- other mobile equipment and vehicles,
- energy sources eg compressed air, hydraulic and other pressures, electrical,
- emergency response planning, and
- others.

b) Workplace Inspection Checklists (Safety Auditing)

Safety auditing is a management tool for measuring and managing safety performance and cost. You can benefit from applying safety auditing techniques. Safety auditing involves evaluating safety performance using checklists and measurable criteria. It aims to identify non conformances with a view to eliminating or controlling them.

Checklists are the traditional method of safety auditing. Checklists allow a comprehensive approach to auditing.

The following table has been developed as a hazard checklist for exploration sites and as a tool for the development or improvement of safe working systems. The hazard checklist is general. However, site specific issues need to be added to the list. The word "other" is therefore used throughout this document for you to add identified site specific hazards.



Hazard Checklist

OBSERVATION	IDENTIFIED HAZARD / ISSUE	RISK RANKING	MEASURES IN PLACE? YES/NO/NA	WHAT MEASURES TO BE TAKEN/IMPROVED	COMPLETION DATE
1. Wire Ropes	1.1 Regular inspections Note: Industry standard is to change out every 12 months or if driller requests it due to high potential for struck-by injury due to wear or corrosion				
	1.2 Procedure in place				
	1.3 Other -				
2. Rig modifications	2.1 Modifications a) authorised, b) approved c) recommended by manufacturer				
	2.2 If not by manufacturer, is it certified by a structural engineer, cert. Held.				
	2.3 Other -				
3. Structural	3.1 Regular inspection of mast and other components for stress/metal fatigue				
4. Electrical	4.1 Earth leakage on main/outlets/lights				
	4.2 Earth leakage testing routine				
	4.3 Electrical leads/extension cords to standard (ie current tag by qualified electrician)				
	4.4 Portable generators to standard Note: Earth stake is not recommended.				
	4.5 Welder's power outlets have earth leakage protection				



OBSERVATION	IDENTIFIED HAZARD / ISSUE	RISK RANKING	MEASURES IN PLACE? YES/NO/NA	WHAT MEASURES TO BE TAKEN/IMPROVED	COMPLETION DATE
5. Overhead Power Lines	5.1 Site planning				
	5.2 Location				
	5.3 Moving				
	5.4 Parking up				
	5.5 Other -				
6. Dust; such as Silica	6.1 Require PPE (correct dust mask)				
	6.2 Check rock/cuttings				
	6.3 Sample dust				
	6.4 Upgrade PPE				
	6.5 Dust collection/suppression systems				
	6.6 Other -				
7. Guarding and safe procedures to prevent access to moving parts	<p>7.1 Transmission guards eg pulleys, gears, shafts</p> <p>Note: Consider isolation with lock out system at drill control panel with strict procedures to use them when the driller's offsider climbs alongside mast or handles equipment nearby moving parts. Safety Alert SA 06-21 at www.dpi.nsw.gov.au/minerals/safety/safety_alerts/2006.</p> <p>Also Safety Alert SA 05-03 at www.dpi.nsw.gov.au/minerals/safety/safety_alerts/2005</p>				



OBSERVATION	IDENTIFIED HAZARD / ISSUE	RISK RANKING	MEASURES IN PLACE? YES/NO/NA	WHAT MEASURES TO BE TAKEN/IMPROVED	COMPLETION DATE
	7.2 Hydraulic water pump guard				
	7.3 Rod whip guard (ie guard over rotating rods)				
	7.4 Point of operation guards eg rods. Note: Guarding rotating rods is industry standard				
	7.5 Sample splitter cone length (when RC drilling)– Note: the length of the cone below the sample splitter should be of sufficient length that a person can not reach up through the cone into the splitter (to for example retrieve a sample bag blown up) and amputate fingers in the splitter (see WA Significant Incident Report 146 at www.dmp.wa.gov.au/resource/safety/mining/mining_publications)				
	7.6 Other				

OBSERVATION	IDENTIFIED HAZARD / ISSUE	RISK RANKING	MEASURES IN PLACE? YES/NO/NA	WHAT MEASURES TO BE TAKEN/IMPROVED	COMPLETION DATE
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OBSERVATION	IDENTIFIED HAZARD / ISSUE	RISK RANKING	MEASURES IN PLACE? YES/NO/NA	WHAT MEASURES TO BE TAKEN/IMPROVED	COMPLETION DATE
8. Access	8.1 Ladders and stairways to standard Note: May require a short portable ladder (tied off) to enable operator to reach bottom of mast ladder safely. Consider widening the ladderway on the mast as some can be too narrow				
	8.2 Handrails and platforms to standard/non-slip surfaces. Note: Consider Australian Standard 1657				
	8.3 Safety harness/lanyard on mast to attach. Note: Using a harness and lanyard when on the mast ladder has become industry standard				
	8.4 Housekeeping. Note: Keep all work areas clear to reduce trip hazards. Consider NSW DPI Safety Alert SA99-18 at www.dpi.nsw.gov.au/minerals/safety/safety-alerts/1999				
	8.5 Other -				
9. Clothing	9.1 Loose or ill-fitting shirt/trousers/jackets				
	9.2 Policy/rules in place				
	9.3 Appropriate PPE being worn Note: Industry standards have included: hard hat, hearing protection, dust mask (for silica), safety eyewear, safety boots, reflective vests, gloves, safety harness, weather protection, sunscreen				



OBSERVATION	IDENTIFIED HAZARD / ISSUE	RISK RANKING	MEASURES IN PLACE? YES/NO/NA	WHAT MEASURES TO BE TAKEN/IMPROVED	COMPLETION DATE
10. Fire Protection and Prevention	10.1 Fire extinguishers to standard (ie correct type, inspection tag, location)				
	10.2 Potential fuels recognised/assessed				
	10.3 Other -				
11. Access tracks to and from the site	11.1 Narrow and difficult terrain may have to be traversed when going to and from a site. Note: Consider: <ul style="list-style-type: none"> restricting the type of vehicle to those that can safely access site, the competence of operators, if weather conditions change, 				
	11.2 Consider emergency vehicles finding rig location Note: Consider placing clear signs along tracks for visitors and emergency vehicles				

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12. Underground Utilities	12.1 Power/gas/communication				
	12.2 Other -				
13. Electrical Energies	13.1 Inspection by electrical contractor				
	13.2 Inspection tag to standard				
	13.3 Other -				



OBSERVATION	IDENTIFIED HAZARD / ISSUE	RISK RANKING	MEASURES IN PLACE? YES/NO/NA	WHAT MEASURES TO BE TAKEN/IMPROVED	COMPLETION DATE
14. Lifting	14.1 Manual handling (safe lifting limit). Note: Consider reviewing all manual handling. Certain jobs may need to be 2 or 3 person handling only				
	14.2 Mechanical methods available Note: Consider using an electric wireline winch mounted on back of mast to reduce manual handling (see innovation safety award 2009, page 8 at www.cmewa.com.au and click on ohs)				
	14.3 Other -				



OBSERVATION	IDENTIFIED HAZARD / ISSUE	RISK RANKING	MEASURES IN PLACE? YES/NO/NA	WHAT MEASURES TO BE TAKEN/IMPROVED	COMPLETION DATE
<p>15. Handling Procedures (Rods)</p> <ul style="list-style-type: none"> - pre-drilling - production - maintenance - post drilling - jammed rods 	<p>15.1 Drill rods</p> <p>Note: Consider:</p> <ul style="list-style-type: none"> (1) installing a compression ring on drill rods when removing a worn down Saver Sub from the spindle when rods are attached (see innovation safety award 2008, page 1 at www.cmewa.com.au & click on ohs). (see also WA Significant Incident Report 87 at www.dmp.wa.gov.au/resource/safety/mining/mining_publications) (2) installing lock out isolation of drill control panel and strict procedures when driller's off-sider climbs alongside mast or handles equipment nearby moving parts (see Safety Alert SA 0621 at www.dpi.nsw.gov.au/minerals/safety/safety-alerts/2006) (3) implementing manual handling improvements such as an hydraulically operated rod handling system, fully automated breakouts on the drill table, harness attachment points, remove air compressor truck (see winner innovation safety award 2007, page 1 at www.cmewa.com.au click on ohs) 			<p>Note (continued):</p> <p>(4) Consider not using "stillsons" when assisted by hydraulic pressures. They are only meant for manual use. See (1) WA Significant Incident Report 113 at www.dmp.wa.gov.au/resource/safety/mining/mining_publications and (2) NSW DPI Safety Alert SA06-11 at http://www.dpi.nsw.gov.au/minerals/safety/safety-alerts/2006</p>	



OBSERVATION	IDENTIFIED HAZARD / ISSUE	RISK RANKING	MEASURES IN PLACE? YES/NO/NA	WHAT MEASURES TO BE TAKEN/IMPROVED	COMPLETION DATE
	15.2 Lifting equipment – scheduled inspections/maintenance				
	15.3 Procedures when situations change (such as jammed rods) Note: Consider reviewing and establishing new procedures after unscheduled situations have occurred to reduce the risk level when again encountered in future				
	15.4 Other -				
16. Fitness for Work	16.1 Isolated and away from home Note: Consider ramifications (eg drug and alcohol issues)				
	16.2 Hours of work Note: Consider 10 hour shift duration. This has become an industry standard.				
	16.3 Fatigue effects Note: Drilling is very physically demanding. Relates to 16.2 issue. Guide to Fatigue Risk Management soon to be released by NSW DPI MSAC.				
	16.4 Drug and alcohol Note: Drug and alcohol policy, education and testing				
	16.5 Other -				



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17. Power Tools and high pressure hoses	17.1 Meets industry / Australian standard Note: Safety Bulletin on power tools at NSW DPI Safety Bulletin SB07-08, at http://www.dpi.nsw.gov.au/minerals/safety/safety-bulletins/safety-bulletins-2007				
	17.2 Inspection and testing				
	17.3 Unwanted pressure releases Note: Consider offside standing well clear of any hoses or plant that may be subject to high pressure activated by the driller. Note: Three serious incidents have occurred. See WA Significant Incident Reports 119 & 145 at www.dmp.wa.gov.au/resource/safety/mining/mining_publications . Also NSW DPI Safety Alerts SA04-04, at http://www.dpi.nsw.gov.au/minerals/safety/safety-alerts/2004				
	17.4 High pressure injection hazard (see 20.3 below) Note: Consider numerous serious accident reports from NSW DPI Safety Alerts SA06-16, SA05-15, SA04-13, SA02-14, SA00-02 and SA98-08 at http://www.dpi.nsw.gov.au/minerals/safety/safety-alerts				



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	17,5 Defective equipment Note: Consider a system for tagging out-of-service gear and a designated area be established for defective equipment so other persons / shifts are aware				
	17.6 Other -				
18. Rig Access/Set up	18.1 Level ground access				
	18.2 Rig stability Note: See US fatal accident report April 10, 2000 at: www.msha.gov/FATALS/2000/FTL00M11.HTM				
	18.3 Wooden blocks – wood grain to be horizontal so forces won't split timber				
	18.4 Other -				
19. Deep Ponds/Dams	19.1 Persons falling into a dam Note: Consider a shallow dam to allow persons to stand up, ladder kept in dam Edges be battered, fences, signs.				
	19.2 Plastic sheeting – trip/slip hazard Note: Consider rubber matting for traction and tied down hessian for absorption of wastes.				
	19.3 Other -				
20. First Aid Injuries	20.1 First aid kit available				
	20.2 Qualified first aiders on-site				
	20.3 Education and training in high pressure injection injury Note: Procedure for treatment see NSW DPI publication MDG 1016 pages 48-58 at http://www.dpi.nsw.gov.au/minerals/safety/publications/mdg .				
	20.4 Snake or other bites				



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	20.5 Other -				

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21. Operator Training	21.1 Competence for tasks undertaken				
	21.2 Toolbox/safety meetings				
	21.3 Standard operating procedures (SOP) (available on-site)				
	21.4 Hazard identification (JSA's)				
	21.5 Emergency management plan (available on site)				
	21.6 Changed conditions training Note: JSA may identify high risk and procedure is supervisor's advice is then required to establish controls				
22. Induction	22.1 See "Attachment 1"				
23. Weather Protection	23.1 Sun protection				
	23.2 Protection from cold				
	23.3 Shelter from rain				
	23.4 Other -				
24. Bunding	24.1 Fuel storage				
	24.2 Recycled water				
	24.3 Environmental spill Note: Consider plastic sheeting in place to direct oils, etc, into dam				



OBSERVATION	IDENTIFIED HAZARD / ISSUE	RISK RANKING	MEASURES IN PLACE? YES/NO/NA	WHAT MEASURES TO BE TAKEN/IMPROVED	COMPLETION DATE
	24.4 Other -				
25. Noise	25.1 >85dBA				
	25.2 Noise barriers – Consider hazard potential eg fire				
	25.3 Other -				

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26. Site Facilities	26.1 Drinking water				
	26.2 Toilet facilities				
	26.3 Washing facilities				
	26.4 First aid equipment (refer 16.3 & 4)				
	26.5 Communication systems (eg mobile phone, satellite phone in remote area, UHF radio) Note: Consider the importance of a reliable system of communications in case of emergency				
	26.6 Other -				
27. General Site Safety and Security	27.1 Signs and notices Note: Consider adding signage along tracks to site for emergency vehicles to find the site if an emergency is called				
	27.2 Visitors induction				
	27.3 Other -				



OBSERVATION	IDENTIFIED HAZARD / ISSUE	RISK RANKING	MEASURES IN PLACE? YES/NO/NA	WHAT MEASURES TO BE TAKEN/IMPROVED	COMPLETION DATE
28. Other	28.1 Such as reporting system that encourages reporting of hazards, near misses, suggestions.				
	28.2 Continuous improvement strategies. Note: Consider NSW DPI Safety Alert SA05-05 at http://www.dpi.nsw.gov.au/minerals/safety/safety-alerts				
	28.3				



Attachment 1

EXPLORATION SITES HAZARD IDENTIFICATION GUIDE

Induction Checklist

Exploration employees and contractors should be inducted and understand the following:

Company Induction

Personal Protective Equipment:

Site Specific Induction (incl. hazards)

Safety Helmet

Manual Handling

Safety Footwear
(lace up recommended)

Standard Operating Procedures (SOP)

Hearing Protection

Communication

Dust Mask (for silica)

First Aid

Reflective Vests

Emergency Procedures

Safety Eyewear

Accident/Incident Reporting

Skin Protection

JSA training

Safety Harness/Equipment

Gloves

Instructor

Employee

Name: _____

Name: _____

Signature: _____

Signature: _____

Date: _____

Date: _____



Feedback sheet

Your input will be very helpful in reviewing and improving this Exploration Drilling Hazard Checklist document.

Please copy and complete the Feedback Sheet and return it to:

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Do you have any suggested changes to the document?

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