



**IGA-003**

**Surface Minerals  
Exploration Drilling**

**Safety Management  
Assessment**

August 2012

Title: Surface Minerals Exploration Drilling

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## Preliminary

### Scope

This document may be used to help assess the safety management of all mineral exploration drill rigs and associated equipment.

### Objective

To contribute to safe and viable exploration drilling operations, with zero harm. Management of the drill crews, safety on exploration sites and maintaining a safe place of work are essential elements of a sound 'Safety Management Plan'. An effective Safety Management Plan should be part of any sound Business Plan. This assessment provides an opportunity to assess any mineral exploration drilling operation against industry best practice. The main objective in using this document is to identify any gaps between industry best practice and observations and to implement controls for any non-compliance.

### Preface

The process of managing hazards on a drill site must include:

- Competent personnel with a sound knowledge of drilling operations under all possible conditions.
- Equipment fit for purpose, safe to operate and maintained in accordance with manufacturers' specifications.
- A drill site that is prepared to a standard where risks of injury are minimised.
- A comprehensive and effective risk management process.

### Contract Management

It is an expectation that in awarding an Exploration Drilling contract, a significant part of the tender evaluation is directed towards tenderers' safety management systems. In assessing the safety management of exploration drilling operations a compliance check against all elements of contractual safety systems should be considered. Reference to parts of MEX-011 may provide guidance in this regard.

## About the Surface Minerals Exploration Drilling Safety Management Assessment

The assessment tool will provide the exploration licence holder, the drilling contractor and departmental inspectors with an effective means of assessing the drilling operation, including employee competencies, drilling plant and associated equipment, communication and risk management.

It is recommended that the following five basic steps are followed:

- 1) Notification of the assessment, together with a clear indication of the scope and guidelines.
- 2) Interviews with key personnel.
- 3) Gathering of records, verifying actions by observation of activity.
- 4) Correlations of interview notes, documents and observation in the workplace to finalise the assessment report and establish recommendations.
- 5) A presentation to exploration licence holder and/or drilling contractor management for information and to gain commitment to implementing controls/improvements.

The assessment tool is set out in columns:

- |          |   |
|----------|---|
| Column 1 | The “ <i>Assessment Criteria</i> ” column provides assessment criteria, relevant documentation, particular pieces of equipment or standards for suggested <i>items or topics</i> .  |
| Column 2 | The “ <i>Compliant</i> ” column is used to assess whether the criteria examined <i>complies</i> .   |
| Column 3 | The “ <i>Comments/Improvements</i> ” column allows the assessor to record information that may be required during the feedback process or to record agreed actions to address any gaps between observed standards and compliance standards. |
| Column 4 | The “ <i>Complete by</i> ” column sets out an agreed timeline for completion of any non-compliant criteria.   |

## Definitions

**AS** means Australian Standard

**HRD** means Hazard Reduction Device

**JSA** means Job Safety Analysis

**MDG** means Mining Design Guidelines

**MSDS** means Material Safety Data Sheets

**MSMP** means Mine Safety Management Plan

**PPE** means Personal Protective Equipment

**RC** means Reverse Circulation

**RCD** means Residual Current Device

**SOP** means Standard Operating Procedure (also known as Safe Work Procedure (SWP) or Safe Work Method Statement (SWMS))

**VRD** means Voltage Reduction Device.

**Non-compliance** means that at the time of the assessment the assessor demonstrates the minimum requirements of industry best practice or guidance provided in the document have not been met

## References

### Relevant Legislation

*Work Health and Safety Act 2011*

*Mine Health and Safety Act 2004*

*Work Health and Safety Regulation 2011*

*Mine Health and Safety Regulation 2007*

Legislation can be found through the Mine Safety website at:

[www.resources.nsw.gov.au/safety/legislation](http://www.resources.nsw.gov.au/safety/legislation)

### Standards and Guidance Material

AS/NZS ISO 31000:2009 – Risk management – Principles and guidelines

AS/NZS 3000:2007 - Electrical installations

AS/NZS 1200:2000 – Pressure equipment

AS1210-2010 – Pressure vessels

AS1657-1992 – Fixed platforms, walkways, stairways and ladders – Design, construction and installation

AS1851 – Maintenance of fire protection systems and equipment

MDG 1010 Minerals Industry Safety and Health risk management guideline

MDG 15 – Guidelines for mobile and transportable equipment for use in mines

MDG 1016 – Guidelines for the management of acute workplace injury and illness. First aid in NSW coal mines

MEX-011 – Contractor Management Audit Checklist

Dial before you dig website – [www.110.com.au](http://www.110.com.au)

Australian Industry Drilling Association website – [www.adia.com.au](http://www.adia.com.au)

Electrical Engineering Safety Electric Shock Protocol

Fluid Injection Protocol

## **NSW Trade & Investment Safety Alerts**

SA99-18 Serious injury involving a drilling rig  
SA04-04 High pressure air hose burst on exploration drill rig  
SA05-03 Drillers offsider injured while operating an exploration drill rig  
SA06-11 Field technicians injured at drilling site  
SA06-21 Drill rig incident

## **WA Department of Minerals and Petroleum - Significant Incident Reports**

No. 3 Compressed air hose connection - fatal injury  
No. 36 Injuries sustained whilst working on a drilling mast  
No. 47 Injuries sustained while working on a drilling mast  
No. 79 Exploration drill hole intersection  
No. 87 Drill rod handling - serious accident  
No. 109 Fitting of tile boxes on drilling rigs  
No. 113 Drillers offsider struck by "Stilson" type wrench  
No. 119 Drillers offsider blasted with sample dust under pressure  
Safety Bulletin No. 1 Booster compressor explosions - reverse circulation (RC) drilling  
Safety Bulletin No. 21 Surface drill rigs - protection from rotating parts  
Code of Practice Mineral Exploration Drilling

## **Queensland Government – Safety Alerts**

No.128 Uncontrolled fall of drill rod: drillers offsider injured

## **Queensland Government – Safety Bulletins**

No. 11 Use of restraining devices on hoses  
No. 67 Managing high pressure fluids and gases  
No. 88 Management of dust containing crystalline silica (quartz)  
No. 91 Heat stress  
No. 115 Risk management of heat exposure in mining

## Assessment Record Sheet

<b>Name of mine operator:</b>	<b>Name of mine:</b>	<b>Location:</b>	<b>Date:</b>
<b>Name of drilling contractor:</b>	<b>Drill make and model:</b>	<b>Exploration lease. No.</b>	<b>Comet ID: (Office use only)</b>
<b>Scope and objective of the assessment. List those assessment criteria that are to be included.</b>			
<b>Names of assessors and participants:</b>			
<b>Assessment notes:</b>			



Assessment criteria	Compliant Yes No N/A	Comments/Improvements	Complete by
<b>1: Access tracks</b> 1.1 Identifying signs to locate drill site 1.2 Tracks suitable for support vehicles access 1.3 Tracks suitable for emergency vehicle access 1.4 Access to helicopter landing pad			
<b>2: Documented drill site inductions</b> 2.1 Correct and sufficient PPE 2.2 Site safety rules 2.3 Emergency procedures 2.4 Emergency communications 2.5 First aid equipment and qualified first aider			
<b>3: Documentation</b> 3.1 Records of inductions 3.2 Safety management plan 3.3 Pre-start checks 3.4 Operating manuals 3.5 Maintenance manuals 3.6 Risk assessments 3.7 SWMS/JSA's/SWP's 3.8 Minutes of tool box meetings 3.9 M.S.D.S 3.10 Register of power tools/lead testing and tagging			

Assessment criteria	Compliant Yes No N/A	Comments/Improvements	Complete by
<b>4: Drill site</b> 4.1 Condition of prepared ground and/or constructed pad 4.2 Free from slip/trip hazards 4.3 Correctly supported jack legs 4.4 Adequate clearance from underground utilities 4.5 Exclusion zone marked out (30m recommended) 4.6 Hazard signage displayed 4.7 Plastic drop sheets under rig			
<b>5: Drill mud sump</b> 5.1 Size and depth of pit 5.2 Safety fence or bunding 5.3 Ramp into pit with safety rope 5.4 Above ground tanks (preferred option)			
<b>6: Rig access (Refer AS)</b> 6.1 Ladders and stairways 6.2 Platforms and walkways 6.3 Safety harness/lanyard to access mast –procedure in place – inspections documented 6.4 Slip/trip hazards			

Assessment criteria	Compliant Yes No N/A	Comments/Improvements	Complete by
<b>7: Work clothes and PPE being used correctly</b> 7.1 Close fitting hi-viz clothes 7.2 Hard hats, hearing protection safety glasses 7.3 Safety boots, gloves, dust masks 7.4 Weather protection, sun screen 7.5 Long trousers 7.6 Long sleeved shirts 7.7 Asbestos issues – throw away overalls			
<b>8: Fire protection and prevention</b> 8.1 Fire extinguishers (refer to MDG15, AS1851) 8.2 Fuel hazards i.e. diesel, petrol, oils & greases, dry grass, leaves, oily rags, waste paper. 8.3 Procedures for refuelling mobile generators/pumps		Consider number of extinguishers, item location and date last checked.	
<b>9: Electrical equipment</b> 9.1 Generators have RCD fitted and regularly tested 9.2 Power tools and extension leads tested and tagged – up-to-date register 9.3 Are isolation procedures in place? 9.4 Portable lighting equipment to AS3000-2007 9.5 Are portable welders fitted with VRD and HRDs?			

Assessment criteria	Compliant Yes No N/A	Comments/Improvements	Complete by
<b>10: Electrical hazards</b> 10.1 Clearance from power lines to AS3000-2007 10.2 Lightning policy in place			
<b>11: Lifting</b> 11.1 Manual handling procedures 11.2 Mechanical handling procedures 11.3 Lifting slings and chains tested & tagged – up-to-date register 11.4 Clamshell, hook and cable serviceable			
<b>12: Drill rod procedures</b> 12.1 Drill rods safely stored in rack 12.2 Production drilling procedures 12.3 Post drilling procedures 12.4 Jammed rods procedures 12.5 Inspection and maintenance procedures 12.6 Rod replacement policy – fatigue/worn threads			
<b>13: Guarding</b> 13.1 Drive shafts, sprockets and chains guarded 13.2 Pulleys and gears guarded 13.3 Drill string guarded and fitted with interlock device			

Assessment criteria	Compliant Yes No N/A	Comments/Improvements	Complete by
<b>14: Wire ropes and winches</b> 14.1 Kinks/broken strands/wires 14.2 Rope replacement policy (usually yearly) 14.3 Winches securely attached to mast			
<b>15: Compressed air systems including booster compressor</b> 15.1 Air receiver (tank) inspection and pressure test current to AS1210 15.2 Damage to air lines and fittings 15.3 Cyclone sample hose fitted with whip checks and sock 15.4 Hose clamps correct size and undamaged 15.5 Booster hose restrained and without sharp bends 15.6 Is the booster compressor fully enclosed?			
<b>16: High pressure and/or high temperature oils</b> 16.1 Identified high pressure and/or high temperature hoses/pipes 16.2 Protective shielding/guarding is in place			

Assessment criteria	Compliant Yes No N/A	Comments/Improvements	Complete by
<b>17: Operating controls</b> 17.1 Clearly labelled operating controls 17.2 Emergency stops 17.3 Lockouts 17.4 Hazard labels			
<b>18: Top head drive and air swivel</b> 18.1 Condition of pull down cables and/or chains 18.2 Oil leaks 18.3 Sample hose securely attached and fitted with sock			
<b>19: Automatic rod handler</b> 19.1 Pinch points 19.2 Potential impact hazards 19.3 Proximity of persons			
<b>20: Rod rack or sloop</b> 20.1 Pinch points identified/labelled 20.2 Emergency stops 20.3 Signage			

Assessment criteria	Compliant Yes No N/A	Comments/Improvements	Complete by
<b>21: Hydraulic systems</b> 21.1 Hoses and fittings undamaged 21.2 Secured and clamped securely 21.3 Fire resistance on high risk areas 21.4 Hose socks and shielding in place 21.5 Control banks fitted with lockout 21.6 Pressure/flow gauges working 21.7 Oil leaks 21.8 Isolating valves in good working condition			
<b>22: Drill mast</b> 22.1 Metal fatigue or corrosion 22.2 Cracked or damaged members 22.3 Repairs and modifications are engineer certified and OEM approved 22.4 Mast locks in place i.e. pins/wedges/stays			
<b>23: Fitness for work</b> 23.1 Drug and alcohol policy 23.2 Fatigue management plan (including travel and accommodation arrangements) 23.3 Physical demands identified and controlled			

Assessment criteria	Compliant Yes No N/A	Comments/Improvements	Complete by
<b>24: Dust hazards</b> 24.1 Are dust collectors fitted for RC drilling? 24.2 Is dust monitoring carried out? 24.3 Are dust suppression systems in place? 24.4 Do drill crews undergo lung function testing? 24.5 Are dust hazards identified e.g. silica, asbestos etc?			
<b>25: Emergency communications</b> 25.1 Satellite/Mobile phones 25.2 UHF/VHF radio 25.3 Working alone procedure 25.4 GPS coordinates posted on emergency plan (recommended)			
<b>26: Qualifications and training</b> 26.1 Cert 3 in Drilling Operations recommended 26.2 Trainee driller documentation 26.3 Is the offsider competent?			
<b>27: Site facilities</b> 27.1 Drinking water 27.2 Toilet facilities 27.3 Washing facilities/separate water supply			



Assessment criteria	Compliant Yes No N/A	Comments/Improvements	Complete by
<b>28: Utilities assessed</b> 28.1 Electrical power – above and below ground 28.2 Communication cables 28.3 Gas mains or pipes 28.4 Water pipes			
<b>29: Extreme weather protection</b> 29.1 Site shed provided 29.2 Heating & cooling 29.3 Shade cover			
<b>30: General</b> 30.1 Have wildlife/snakes been considered for the terrain and is a snakebite kit available 30.2 In the event of a bushfire, has a second egress been planned as part of your emergency escape procedure			

## Feedback sheet

Your comments will be very helpful in reviewing and improving this document.

Please copy and complete the feedback sheet and return it to:

*Central West Area Manager  
Mine Safety Operations  
NSW Trade and Investment  
Locked Bag 21  
Orange NSW 2800  
Fax: (02) 6360 5363  
Phone: (02) 6360 5333*

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**What do you find most useful about this document?**

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**What do you find least useful?**

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**Do you have any suggested changes to the document?**

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