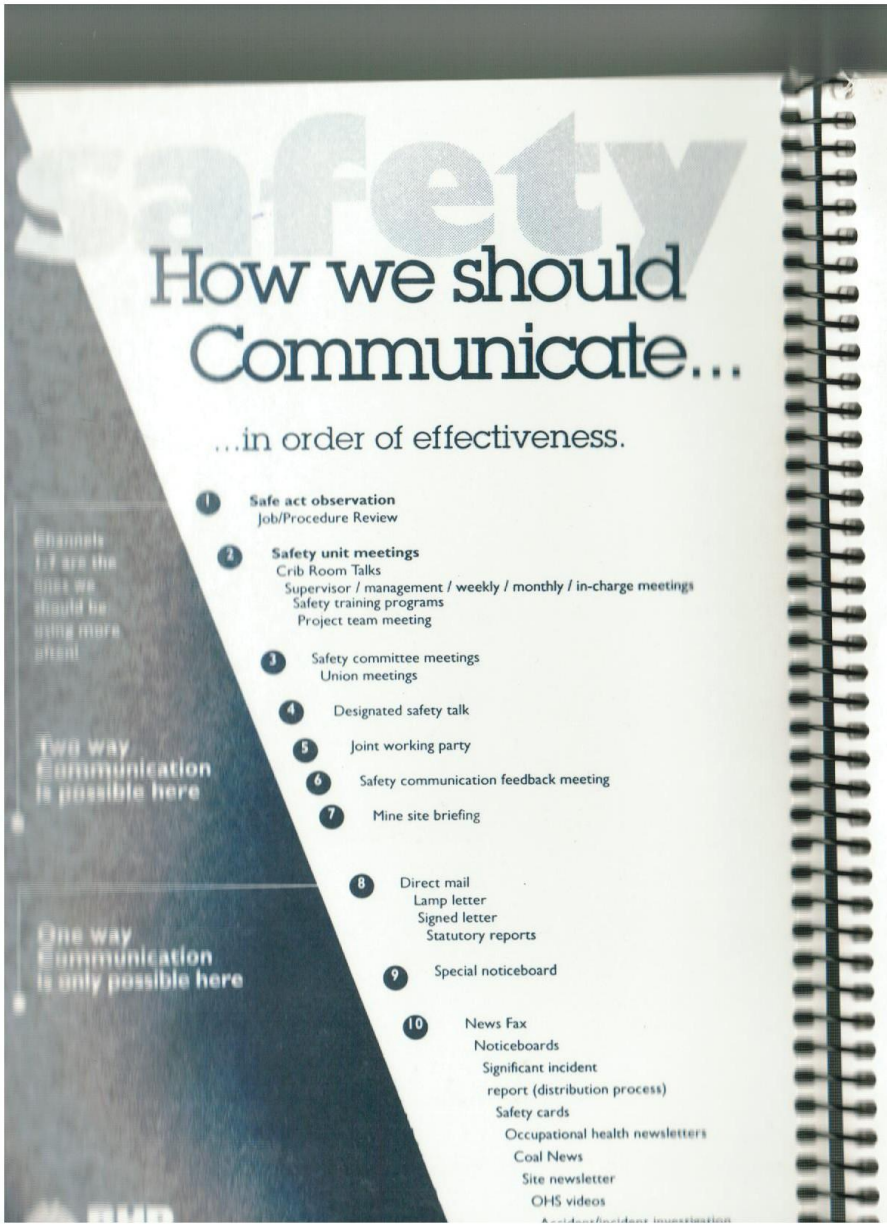


Training Module

Appin Colliery

Methane Drilling

Contents

Printed July 1996. Revision 0

Produced by Wisdom Graphic Design. Illustrations by David Wilcock

AMENDMENT

SECTION	AMENDMENT	PAGE No.	DATE

Introduction

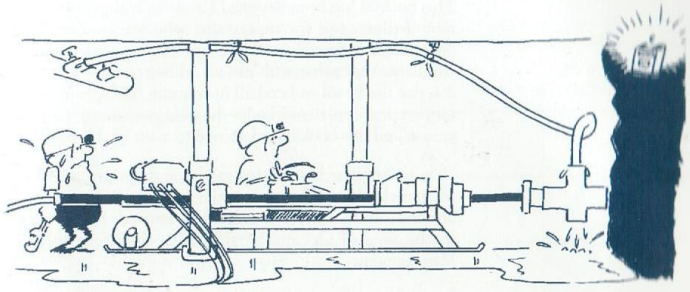
This booklet has been designed for use as both a training guide for new drillers, and for supervisors who are exposed to drilling operations. It provides an ongoing guide to help employees re-familiarise themselves with various drilling circumstances. However, it is not the be all and end all in training. There is no substitution for practical experience under the guidance of a more experienced person and this booklet is designed to assist in this process.

New technology has assisted methane drainage crews to provide adequately drained areas in order to meet increased production demands. In recent years, additional demands have been required in the area of Occupational Health & Safety and Outburst Management.

Regardless of technological improvements, successful gas drainage relies on adequately trained and knowledgeable drilling employees. Skilled employees currently working at Appin Colliery are vital to the effectiveness of its gas drainage program.

In order to further develop our people, suggestions to improve this training handbook would be greatly appreciated.

Gas Drainage Engineer.



Warning and Remember icons will appear throughout this hand book as shown below and MUST ALWAYS be adhered to or the application thereof.

WARNING

Indicates an action or condition that, if not followed, could cause injury to personnel or equipment.

REMEMBER

Indicates a procedure or condition that is essential for the operator to know.

Appin Colliery
Collieries Division

VISION ➢ To be the world's best supplier of coking coal .

MISSION ➢ To provide...

a sustainable competitive advantage to BHP Collieries Division,

and,

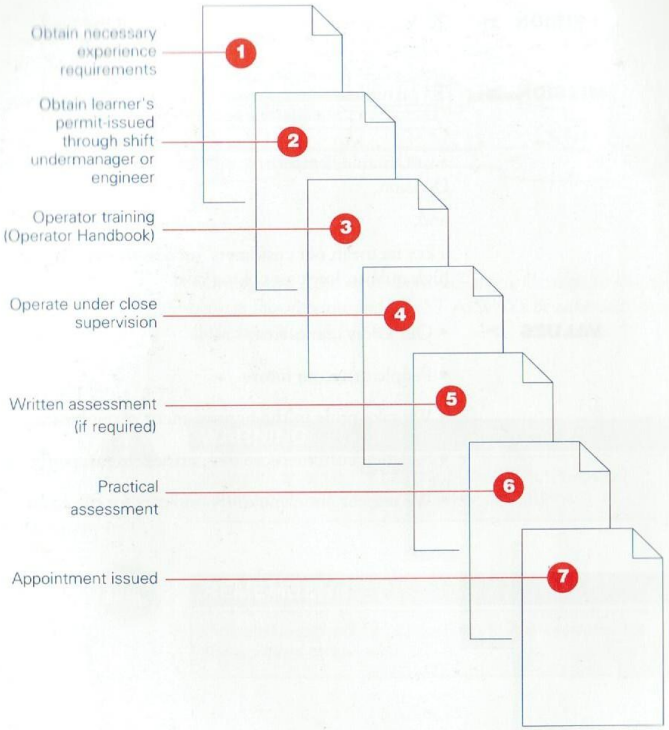
a key factor in our customers' success through the supply of high quality, low cost coking coal.

VALUES ➢

- Our safety comes first.
- People drive our future.
- We take pride in the improvement of our business.
- Satisfied customers are our partners in prosperity.
- We respect our community and care for the environment.

Training Steps

Steps to Authorisation



Dealing With Hazards

Working at a Drill Site

HAZARDS ➢ The hazards associated with working at a drill site are:

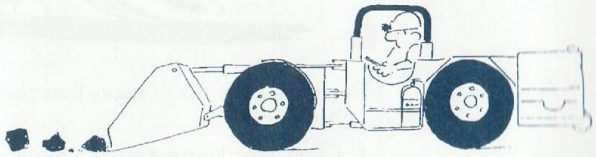
- Accumulation of oil or grease.
- Loose material, tools, hoses or cables.
- Loose coal ribs or roof stone.

To minimise the risk of injury from these hazards the operator should:

- Clean/ hose down surfaces/floor/work area to remove any accumulations of oil or grease.
- Pick-up and make safe loose material underfoot, and tie up hoses and cables.
- Store loose tools & materials. Tidy and clear walkways.
- Place refuse in garbage bags.
- Stonedust the work site to improve visibility.

REMEMBER

It is Colliery standard to clean and level a drill site during the set up procedure.



This can be done by using a Domino with a bucket attachment, shovel, or if necessary, picking up the loose material by hand.

- Scale down loose rib and roof material.

- Sound the roof & rig to ensure integrity.

- Install additional support if required.

Hazards Produced by Drilling

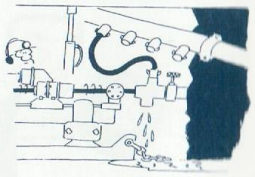
The hazards caused by drilling are:

- Seam gas released into the work area.
- Accumulated waste water on walkways and transport roadways.
- Waste water accumulates in the suction range.

To minimize the hazards produced by drilling and to ensure efficient coal seam drainage, the Colliery has developed a list of standards that should be observed at all drill sites.

IMPORTANT

- Whilst drilling and whilst the hole is standing to be drilled further, suction should be applied to the hole through a stuffing box. This should be regulated to draw off the gas as it is produced from the hole, without drawing water or excessive air into the range.



- Since waste water is or causes a hazard, it must be contained near the drill site by a stonedust dam or a gas/water separator or both. A pump should be used to pick up the water and discharge it into the waste water range. The district supervisor will confirm if a pump **DOES NOT** need to be used.

Operator Responsibilities

When a hazard is recognised, stop drilling & take the necessary action to remedy the harzardous situation whether it be a defect in the drilling machine, ventilation or excessive gas emissions from the hole or instability in the roof and rib. Only recommence after the hazard has been removed.

REMEMBER

It is the responsibility of the employee to rectify a hazardous situation if it is within their ability or report the hazard to a supervisor or engineer.

If an employee is unable to rectify a hazardous situation, or is working on a machine to remedy a defect, consider the appropriate safety tag should be attached.

PERSONAL DANGER TAG ➢

Personal Danger Tags are to be completed, signed and attached to switches, valves etc... by the person who would have been in danger by the operation of that switch or valve. (e.g. repairs or maintenance).

REMEMBER

YOU fill it out
YOU put it on
YOU remove it
YOU destroy it

REMEMBER

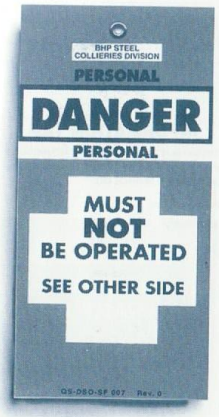
Personal Danger Tags can only be removed by the person whose name appears on the tag, except in extra ordinary circumstances

OUT OF SERVICE TAG ➢

Out of Service Tags are to be completed, signed and attached to equipment that is unserviceable or withdrawn from service.

PERSONAL DANGER TAG ➢

Front



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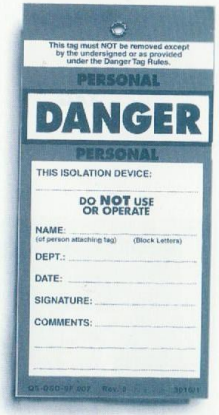
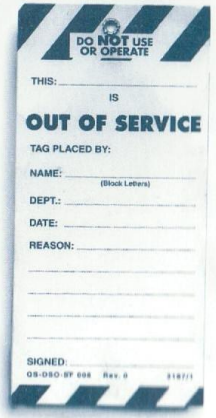


OUT OF SERVICE TAG ➢

Front

Back



Front Back

INFORMATION TAG ➢

INFORMATION TAG

THIS TAG **MUST NOT** UNDER ANY CIRCUMSTANCE BE USED AS A SUBSTITUTE FOR A DANGER TAG OR AN OUT OF SERVICE TAG.

TAG PLACED BY: .....

DEPARTMENT: .....

DATE: ..... TIME: ..... a.m. p.m.

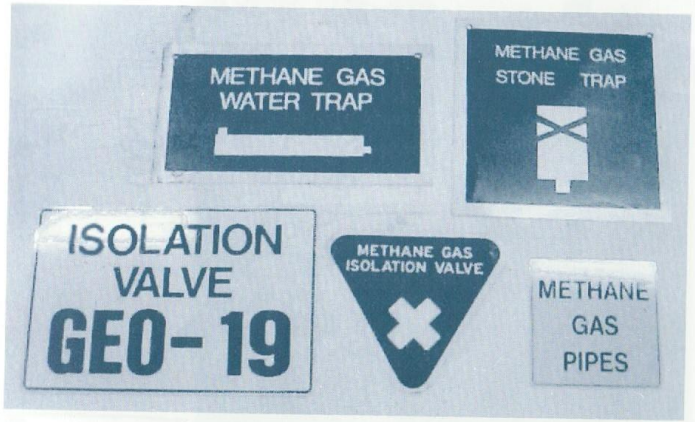
MESSAGE:

This tag should be used at all times when information needs to be passed on to others concerning equipment, Core Nº, survey holes or any general information, and should be used at the completion of each hole indicating hole Nº, length of hole, completion date and any other relevant information.

Section 1.1 DEALING WITH HAZARDS

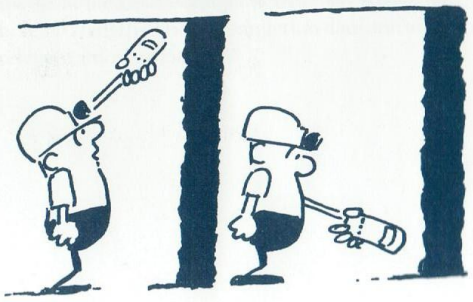
Signs

Signs which show Methane values, pipe lines & water traps. (Figure 1)



Use of a Methane Detector

The Manager has stipulated additional rules for the use of an automatic Methane Detector (A.M.D.) at a drill site. QS-ACM-SP030.



(Figure 2). Use of Methane Detector (Mentor)

BHP

Appin Colliery
Collieries Division
BHP Steel

STANDARD PROCEDURE

DEPARTMENT: MINING

TITLE OF STANDARD:

ADDITIONAL MANAGER'S RULES

USE OF AUTOMATIC METHANE DETECTORS FOR UNDERGROUND GAS DRAINAGE DRILLING OPERATIONS

ORIGINATOR: S Lowe	AUTHORISATION:
AUTHORISER: S Lowe	
TITLE: Mine Manager	

1. Whenever gas drainage drilling operations are being carried out, an automatic methane detector **must be used**.
2. This requirement applies to ALL drilling operations whether the drill rig is powered by an electro-hydraulic power pack or by compressed air.
3. The automatic methane detector shall be positioned in the upper third of the [illegible] on the return side of the mouth of the hole being
4. The automatic methane detector shall be designed to give an audible and/or visual alarm at 1% CH4.
5. Upon an alarm warning being given, the following rules shall apply to the drill rig operators:
   a) All drilling operations shall cease immediately
   b) Where applicable, power shall be removed from the power pack
   c) The alarm shall be reported, as soon as practicable, to a mining official
   d) Drilling operations may not recommence until a Deputy or Senior Mining Official has inspected the area and found it safe to do so
6. If the automatic methane detector is not present or becomes ineffective for any reason, drilling operations shall not be carried out.
7. A person to whom an automatic methane detector is issued, shall ensure that it is kept free from damage and returned to the lamp room at end of shift.
8. A book (register) shall be kept in the lamp room to record the issue of automatic methane detectors.

UNCONTROLLED COPY

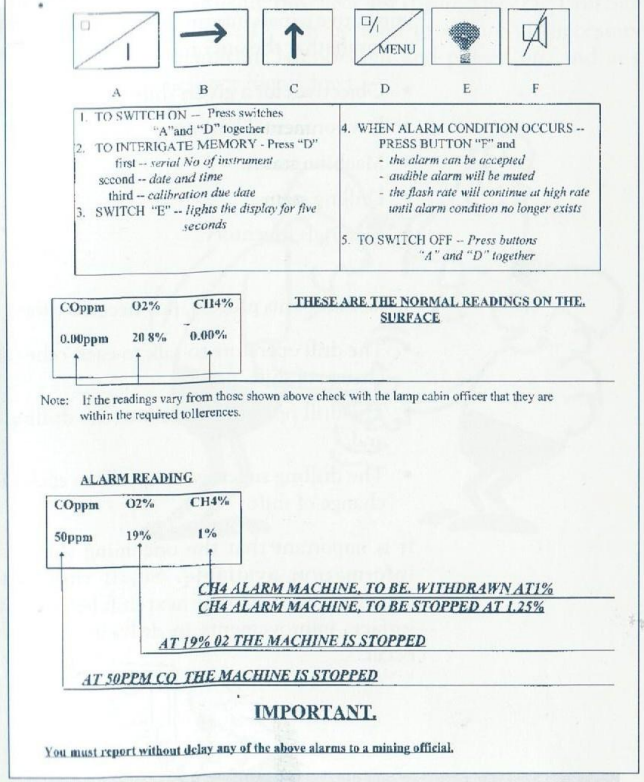
QS-ACM-SP0.00
Rev. 0: 19/1/96

page 1 of 1

(Figure 3). The Manager's Rules for using an A.M.D. (Uncontrolled Copy).

Section 1.2 USE OF A METHANE DETECTOR

(Figure 4). Use of Methane Detector (Mentor)



Communication

Since drill operations are an ongoing process, it is imperative to pass information from one shift to the next to ensure that the oncoming operators are aware of:

- Objectives for a given shift.
- Environmental hazards.
- Machine status.
- Drilling status.
- Materials inventory.

To facilitate this process, it is necessary for:

- The drill operators to talk to each other at change of shift,
- The drill operators to talk to the drilling supervisor and,
- The drilling supervisors to talk to each other at the change of shift.

It is important that the oncoming shift has the best information available. So, if the operator can communicate this to the next shift before they leave the surface, improvements in drill site management can occur.

Section 1.3 COMMUNICATION

Additionally, the check-list (figure 5 pg 22), "Drill Site Check List", can be used to ensure all necessary information is collected and passed on, and any deficiency highlighted.

Drill Site Check-list for : D.R. at:

item	checked OK	reqd. amt
inspection by mine official		
worksite levelled and free from loose material		
compressed air to the site		
mains water to the site		
suction to the site		
waste water managed		
dam /pump in place		
valves/camloc/fittings		
standpipe		
grout ,plaster		
suction hose		
conduit		
safety relief valves		
drill rig	power pack	water pump
drill rods		
grout mixer and wand		
grout pump		
inclinometer		
mixing drum		
venturi		
2 x stilsons		
reamer for standpipe		
serviceable drill bit/reamer		

(Figure 5). Drill Site Check List (uncontrolled copy)

The Shift Drilling Report

The Shift Drilling Report is filled in to update the Methane Drainage Department in regard to site progress and site requirements. Drill operators can refer to the copy on-site to determine the history of the hole or drill site.

Since each rod is logged on this report by the operator, the report becomes an important document to Management in helping determine the potential outburst risk of a given area in the case of in-seam drilling, and to help determine the most efficient drilling method and penetration of cross-measure holes.

It is a requirement of the Colliery's Outburst Management plan that:

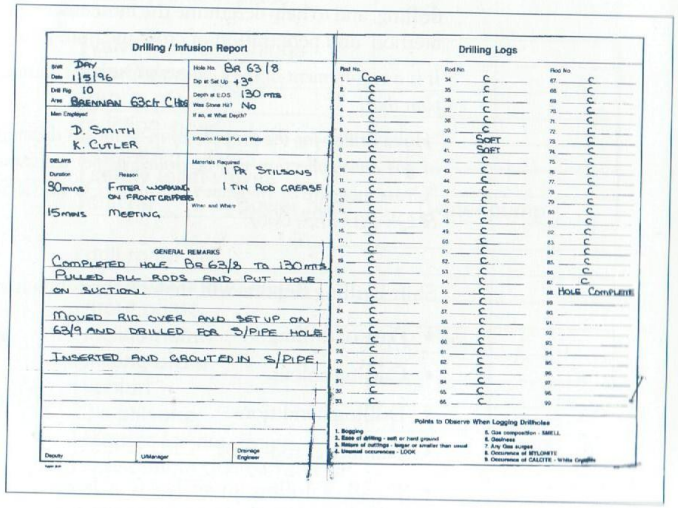
"Holes drilled for the purpose of in-seam gas drainage and/ or gas data collection will be drilled as per assessment for "Cross measure or In-seam Drilling". (QS-ATC EA 001 & QS-ATC EA 006)"

Shift Drilling Reports will include the following data:

- Date of drilling.
- Cutting colour.
- Drilling conditions.
- Number of rods used.
- Detail of drilling anomalies (e.g. bogging, high gas emission, water loss, water emission, lumps of coal ejected, mylonite).

- Panel
- Drill Rig Nº
- Drillers Name
- Hole identification number and location
- All delays encountered during shift to be recorded with times

(Figure 6). Shift Drilling Report



Drilling / Infusion Report

Shift: DAY
Date: 1/5/96
Drill Rig: 10
Area: BRENNAN 63ch Chbs
Men Employed: D. SMITH, K. CUTLER
Hole No.: BR 63/8
Dip at Set Up: +3°
Depth at E.O.S.: 130 mtrs
Water Strike Hit?: No
If so, at What Depth?:
Infusion Holes Put on Water:

DELAYS
Duration: 30 mins — Reason: FITTER WORKING ON FRONT GRIPPERS
Duration: 15 mins — Reason: MEETING

Materials Required: 1 PR STILSONS, 1 TIN ROD GREASE
When and Where:

GENERAL REMARKS
COMPLETED HOLE BR 63/8 TO 130 mtrs PULLED ALL RODS AND PUT HOLE ON SUCTION.
MOVED RIG OVER AND SET UP ON 63/9 AND DRILLED FOR S/PIPE HOLE
INSERTED AND GROUTED IN S/PIPE

Deputy | Ulmanager | Drainage Engineer

Drilling Logs

Rod No. 1: COAL
Rod No. 40: SOFT
Rod No. 41: SOFT
Rod No. 98: HOLE COMPLETE

Points to Observe When Logging Drillholes
1. Bogging
2. Base of drilling - soft or hard ground
3. Return of cuttings - larger or smaller than usual
4. Unusual occurrences - LOOK
5. Gas composition - SMELL
6. Dustiness
7. Any Gas surges
8. Occurrence of WYLONITE
9. Occurrence of CALCITE - White Crystals

Drill Bits & Threads

Appin Colliery Gas Drainage department use's a number of drill bits & threads. The next 3 pages will illustrate an inventory of all these.

TT56 Core Barrell Cutting Bits *(Figure 7).*

Tungsten Carbide bit with PCD reamer (left)
Suitable for coal only.

PCD core bit (right)
Suitable for coal or stone.