INCIDENT INVESTIGATION REPORT

Dozer 320 Rollover Ramp 25 North

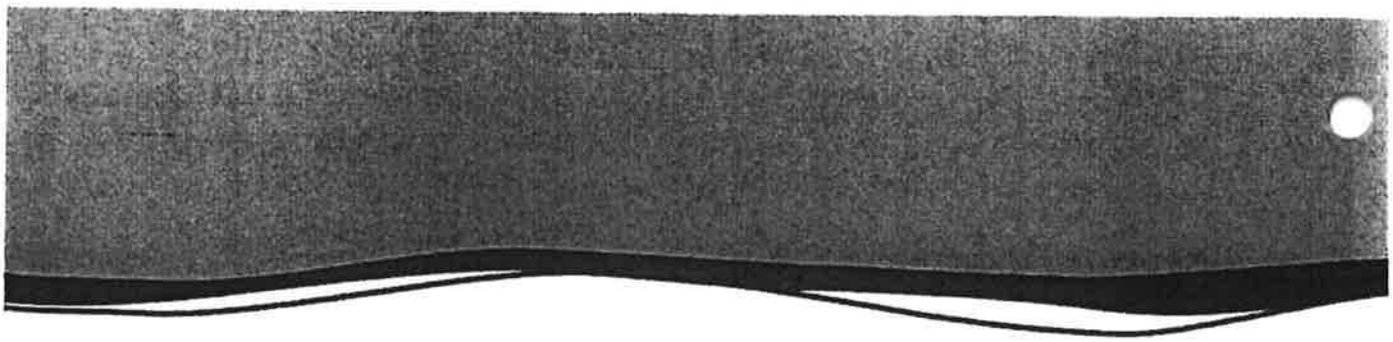
Xxxx Mine

Occurrence Date: 26 April 2011

Investigation Team

NAME	POSITION	SITE	ICAM ROLE
	Manager HSE	Xxxx	Investigation Lead
	Principal Safety	Xxxx	Facilitator
	Advisor Safety	Xxxx	Team Member
	Superintendent Pre-strip	Xxxx	Team Member
	Site Safety Health Representative	Xxxx	Analysis Team Member
	Senior Manager Safety (Acting)	XXXX	Analysis Team Member
	Manager Geotechnical Services	XXXX	Analysis Team Member
	Senior Engineering Geologist	XXXX	Analysis Team Member
	Open Cut Examiner	Xxxx	Analysis Team Member
	Production Employee	Xxxx	Analysis Team Member
	Supervisor Pump & Earthworks	Xxxx	Analysis Team Member
	Head of HSEC	XXXX	Analysis Team Member

NOTE: this Report is part of a safety improvement process at Xxxx Mine. Central to the improvement of safety is the adoption of a "just" culture in which investigations can be carried out. Consequently, this investigation has not been carried out to a legal standard nor can it be said to have used concepts in the manner that those concepts have been used in the Coal Mining Safety and Health Act. Further, statements in this document may not have been verified or are untested statements of opinion. As a consequence, this document is not intended or authorised to be used in any form of legal proceeding or prosecution. The document has been prepared by both XXXX and non-XXXX personnel and is therefore not intended or authorised to operate as an admission by any particular person or organisation, nor is it intended or authorised to be used as evidence in any legal proceeding.



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Contents

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1.0 INCIDENT

1.1 Incident Location

Time: 7:21 am

Date: 26 April

1.2 Details of Injured / Impact

- **Name:** Involved Person
- **Gender:** Male
- **Age:** 55
- **Employer:** Xxxx
- **Position:** Production Employee
- **Place of Residence:**
- **Family:** Married

Injuries sustained: Laceration to back of head, fractured vertebrae, bruising and concussion

Medical Treatment: Airlifted to Base Hospital for treatment. Wound (head) closure via staples, medication and recovery for remainder of injuries.

1.3 Details of Damage / Impact

Equipment Involved: Caterpillar D11R Dozer

Damage to Equipment: Damage to exhaust stacks, handrails and rooftop numbering. Minimal damage to structural integrity of machine.

Environmental Impact: Nil

1.4 Risk Rating – Consequence Level

Actual: *Level 2*

Potential: *Level 4*

1.5 Investigation Process

Option 1

The Xxxx Incident Cause Analysis Method (ICAM) was employed to examine the events surrounding the incident and to determine the possible cause in order to identify recommended actions to prevent a recurrence.

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1.6 Events leading up to the Incident

Over the preceding months leading up to the event a slip occurred in the lowwall of Ramp 25 North. This slip caused spoil material to cover part of the exposed block of lower seam coal in Ramp 25 North. The slip was stabilised utilising dozers and mining commenced on the pit floor. The mining which occurred in Ramp 25 North removed the vast majority of coal in the block however left a rib of coal against the lowwall which was covered by spoil from the lowwall. A decision was made in April to remove the rib of coal by firstly uncovering the remaining coal with dozers; the work was to be performed by the dozer operators within the pump and earthworks crew. This crew are a small crew who perform this type of dozer work on a daily basis. The day prior to the event to area was worked by a dozer operator from pump and earthworks for approximately 4 hours, this work was conducted in Dozer 322.

1.7 Incident Description

On the morning of 26 April 2011, 2 operators and a trainee dozer operator from the pump and earthworks crew were allocated the task of cleaning spoil off the top of a rib of coal in Ramp 25 North. The operators attended a pre-start meeting at the mine operations building where they were allocated the task by their supervisor and asked if they had any queries or questions in relation to the allocated task. The operators were familiar with the task as this was something which they had completed on site in the past. One of the operators had undertaken spoil removal in Ramp 25 North on the previous day and was therefore familiar with the area and the scope of the work.

The 2 operators and the trainee left the prestart area and hopped into a light vehicle and drove to the mobile equipment workshop where the trainee operator was dropped off to collect dozer 322 which was in the workshop overnight to have its cutting edges replaced. The trainee operator was droped at the workshop where he collected dozer 322, the 2 operators continued their journey to Ramp 25 North. On the way to Ramp 25 North the 2 operators discussed the task for the day. On arrival at Ramp 25 North operators drove to the pit floor and looked at the bench which they were to work for the day. The operators said to each other that they knew how to work the area and operator 1 (injured party) commenced conducting a walk around of dozer 320 and then mounted the dozer and commenced working the spoil on top of the rib of coal. Operator 2 left the area and drove to the South of Ramp 25 where Excavator 46 had been working the previous day to see if the machine was manned, the second operator intended to stop dozer 322 on the way past if the excavator was working to rectify a known soft spot in the area. The excavator was not manned and operator 2 drove back to Ramp 25 North and waited on the pit floor observing operator 1 working the spoil. Operator 1 and operator 2 had a discussion on an unmonitored two-way channel in regards to working the area. Operator 1 stated that there was a wet spot on the bench that was causing some trouble and that he was going to go straight and push for a while. The operator of dozer 320 then started to move to the North and work the spoil as he moved North. Operator 1 noted that there was a scallop in the bench, operator 2 replied that he was aware and that he had been pushing material into the scalloped area every chance he got yesterday.

At approximately 7:15am the trainee operator, in dozer 322, arrived at Ramp 25 North, operator 2 gestured to the trainee to tram the dozer to the top of the bench and operator 2 walked up the ramp to the top of the bench in front of the dozer. Dozer 322 reached the top of the bench and the trainee operator dismounted dozer 322 and walked to the North to where operator 2 was standing and they observed operator 1 in dozer 320. Operator 1 took a full blade of dirt and commenced pushing it towards the North, the operator pushed to dirt towards the scalloped area, operator 1 placed dozer 320 in reversed and at this time to material under the right hand track began to collapse, the right hand side of the dozer dropped and twisted towards the edge, the dozer fell away and completed a 360 degree roll landing back on its tracks on the pit floor.

Operator 2 instructed the trainee operator to call an emergency, operator 2 ran down the spoil to the dozer operator on the pit floor. Operator 2 isolated dozer 320 and then proceeded to open the cab door. Operator 2 observed operator 1 in the cab of the dozer in an awkward position in his seat, operator 2 observed that operator 1's eyes were open but not responding. After approximately 5 minutes operator 1 began to come to, operator 2 asked what was hurting which operator 1 replied his head and lower back,

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his lower back was hurting the most. Operator 2 moved operator 1 into a more natural seated position and waited for emergency response to arrive.

1.8 Possible Scenario

The suspected scenario is as follows:

The coal edge has either suffered damaged from blasting which had previously occurred or there was a fault present in the coal. When the dozer moved over the fault or blasting damage it caused the damaged or section of the fault to fail under the dozer and caused the material to subside which inturn caused the right hand track to fall away. There was insufficient material under the right hand side of the dozer to support the dozer which caused it to roll.

1.9 Diagrams and Photographs

Figure 1: *Survey of incident scene*

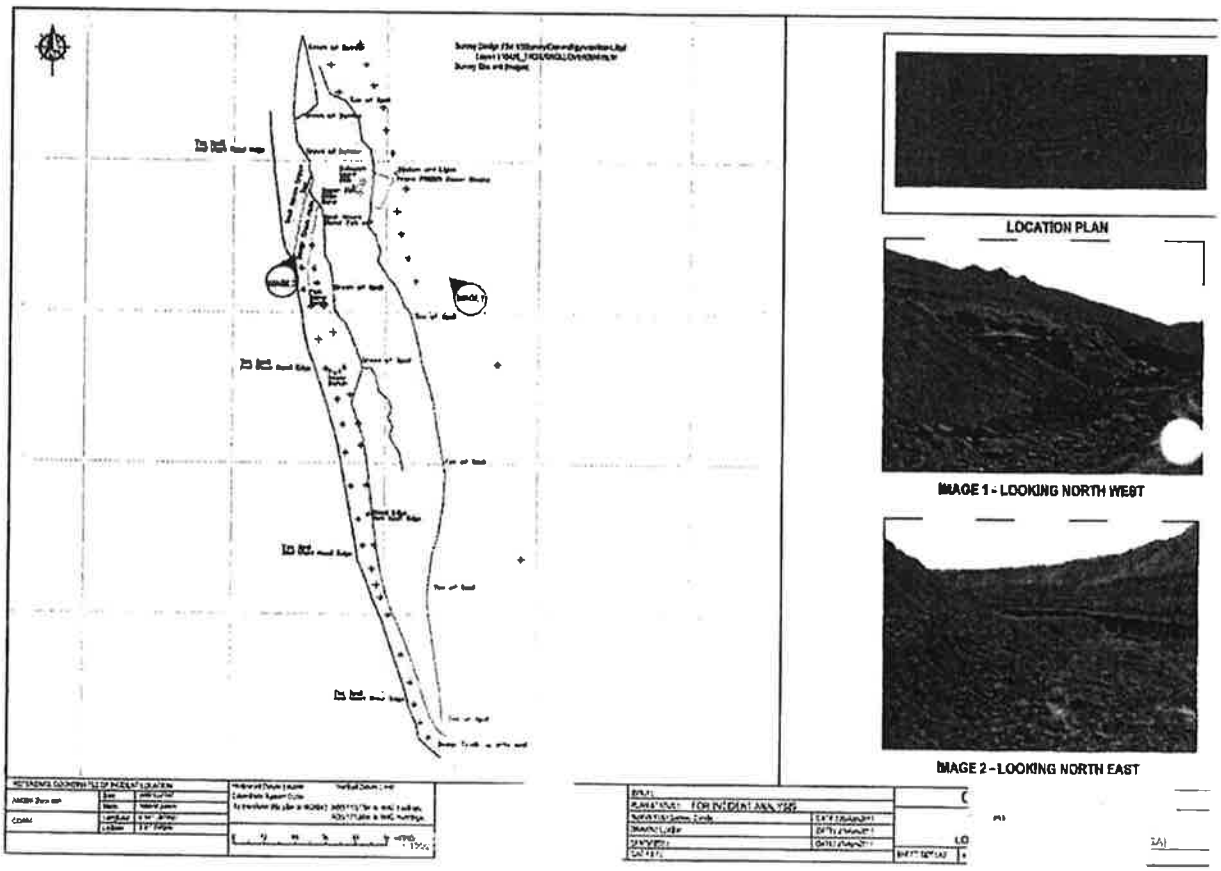

Figure 2: *Final position of dozer*

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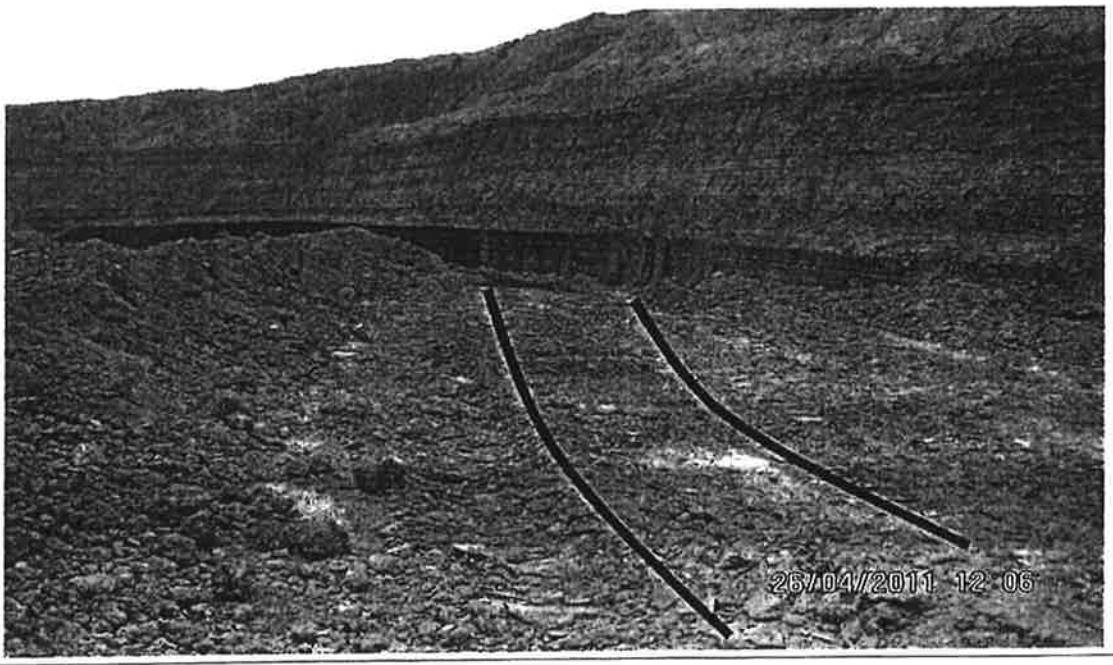
Figure 3: *Approximate path taken by dozer on top of bench*



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2.0 Key Findings

2.1 Basic Cause

The coal edge failed due to either strata failure or blast damage resulting in the dozer rolling from the edge of the bench.

2.2 ICAM Factors

2.2.1 Absent or Failed Defences

DF 02: Protection systems: There was no buttress and inadequate coal rib in the area where the edge failed resulting in the dozer falling from the bench
DF 10: Hazard awareness: Hazard of working within 5 metres of a crest and pushing to an unprotected coal edge was not identified.

2.2.2 Individual or Team Actions

IT 10: Work method: Previous mining process left insufficient coal rib behind
IT 07: Change management: The operator chose to push in an area outside of the buttress protected area.

2.2.3 Task or Environmental Conditions (Workplace)

TW01: Task planning/preparation/manning: Method of leaving a small rib of coal failed to adequately consider the subsequent mining process
TW 23: Surface gradient/conditions: Integrity of coal edge was compromised (due to possibly strata fault or blast damage)
TW 10: Congestion/restriction/access: A wet area and lack of traction in the bench encouraged the operator to work the unprotected face.
Controls outlined in the Guideline for working near slopes and crest (Version 2) were not implemented

2.2.4 Task or Environmental Conditions (Human)

HF 13: Change of routine: Environmental conditions (wet spot) forced a change in the working plan

2.2.5 Organizational Factors (HSEC Standards)

OS01 Organisational - Mine design for lowwall is to toe of coal, current mining practice does not always mine to design

3.0 Recommendations

Action	Hierarchy of Control	Responsible Person	Due Date
Through mine operations info centre develop a measurement tool to monitor compliance to plan for Draglines to mine to toe of coal.	HOC: Administration Evidence Required: Attach	Manager Mine Operations	14 July 2011

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	evidence of the tool to monitor compliance to plan to Fpe.		
Implement a design for remediation of slips which allows for the safe removal of coal from entire pit (include scavenging)	HOC: Re-Design Evidence Required: Attach design to Fpe.	Manager Mine Operations	30 July 2011
Coal Mining superintendent must identify any current situations where a coal rib exists and is required to be mined, once the situations are identified and before the removal of spoil from the top of coal rib the following must take place: - Risk assessment the method for the removal of spoil and coal. - a buttress must be installed from the floor to shore up the coal prior to dozers working on top of coal; - Work Instruction to be created for dozer works on and around coal ribs. The Work Instruction is to include "A Risk Assessment is to be completed prior to works commencing".	HOC: Administration Evidence Required: Attached WI to Fpe.	Superintendent Coal Mining	16 June 2011
Communicate to all mining personnel of the requirement to ensure that the operations checklist contained in the guidelines for working near slopes and crest booklet is utilised where personnel are required to work within 5 metres of a crest	HOC: Administration Evidence Required: Attach communication to Fpe.	Manager Mine Operations	16 June 2011
Update site risk register with hazards and controls identified from ICAM	HOC: Administration Evidence Required: Attach e-mail evidence that action has been completed.	Manager HSE	16 June 2011
Findings and actions to be communicated to all XXXX site General Manager's to review for applicability to their site.	HOC: Administration Evidence Required: Attach e-mail evidence to Fpe.	Manager Mine Operations	16 June 2011
Rollout of New Guideline for Working near Slopes and Crests to all Mine Operations Employees.	HOC: Administration Evidence Required: Attached attendance records to Fpe.	Manager Mine Operations	26 October 2011

4.0 Key Learning's

The ICAM Team identified the following key learning's during the investigation:

- Mine plan and risk assessment should be followed through to the complete removal of all coal from the pit.
- Previous mining process left insufficient coal rib behind

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- The operator chose to push in an area outside of the buttress protected area.
- Method of leaving a small rib of coal failed to adequately consider the subsequent mining process
- Environmental conditions (wet spot) forced a change in the working plan
- Integrity of coal edge was compromised (due to possibly strata fault or blast damage)
- A wet area and lack of traction in the bench encouraged the operator to work the unprotected face.
- Controls outlined in the Guideline for working near slopes and crest (Version 2) were not implemented

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