

Mines Inspectorate (Coal)

Nature and Cause Investigation Report for the Chief Inspector of Mines

Incident at Saraji Coal Mine on the 31st December 2018 – Resulting in the Death of Allan John Houston

Date of report – 03/07/2019

Lead investigator

Graham Callinan, Inspector of Mines

Other investigators

Patrick Hurley, Inspector of Mines (Mechanical)

John Tolhurst, Principal Investigations Officer

Report approval

Lead Investigator

Chief Inspector of Mines

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Table of Contents

1. Executive Summary.....	2
2. Jurisdiction and Scope	3
2.1. Details of the deceased	3
2.2. Health Details	3
3. Incident Details	3
4. Mine Site Details.....	4
4.1. Saraji Mine Location Details.	5
5. Incident Location	6
6. Incident Notification and Response	7
6.1. Notification of Incident.	7
6.2. Notification of Next of Kin	7
6.3. Emergency Response	7
7. List of Persons named in the report.....	8
8. List of abbreviations.....	8
9. Investigation	9
9.1. Time Line	9
10. Dozer 804 Details	10
11. Component Testing	11
11.1. Final Drive Axles.....	11
11.2. Electronic Control Modules.....	11
11.3. Vimms / Product Link ECM.....	11
11.4. Engine ECM.....	12
11.5. Power Train ECM	12
11.6. Implement ECM	12
11.7. Decelerator Pedal (PWM type)	12
11.8. Service Brake Pedal (PWM Type)	12
11.9. Left Hand & Right Hand Steer Levers (PWM Type)	13
11.10. Summary of component testing	13
11.11. Dozer Equaliser Bar.....	13
12. MineStar	14
13. Lighting.....	14
14. Ground conditions and work area.....	16
15. Presence of water.....	17
16. Training and Assessment	17
17. Safety and Health Management System	17
17.1. SRM SWI Bulk Push Dozer Operations (SRM-SWI-0231).....	17
17.2. SRM SWI Pushing over a Highwall or Highwall Bench (SRM-SWI-5812567)	18
17.3. SRM STD Working in and Around Water (SRM-STD-0016)	18
17.4. SRM PRO Risk Management Procedure (SRM-PRO-0056)	19
17.5. SRM SOP 100 Work Place Inspections (SRM-SOP-100).....	20
17.6. SRM SOP 020 Design and Construction Safety Berms.....	20
18. ICAM	21
18.1. Absent / failed defences	21
18.2. Individual / team actions	22
18.3. Task / environmental conditions	22
18.4. Organisational factors.....	23
19. Findings.....	24
19.1. Ground Conditions	24
19.2. Presence of water	24
19.3. Safety and Health Management System Documents.....	25
19.4. MineStar.....	26
20. Conclusion.....	27
21. Actions taken by DNRME after the accident.....	28
22. Recommendations.....	28
23. Appendixes.....	30

1. Executive Summary

At approximately 10:30pm on 31 December 2018, Mr Allan John Houston was fatally injured in an incident at the Saraji Coal Mine. Mr Houston was operating a dozer when it rolled down an excavation before coming to rest on its roof in a body of water and mud. Mr Houston was working with two other dozer operators, Mr [REDACTED] and Mr [REDACTED] at the time of the incident. They were performing dozer push activities as part of a dragline bench preparation at Ramp 2 North. Mr Houston was observed tramming his dozer off the work area and over the edge into the pit below by Mr [REDACTED]. Mr Houston's dozer rolled down the excavation approximately 18 metres into a body of water and mud.

Mr [REDACTED] raised the alarm with the site Emergency Response Team responding. There was no machine access into the pit so dozers were used to push tracks down to enable a rescue. The rescue required slings to be placed on Mr Houston's dozer so it could be towed back onto its tracks by the other dozers.

This operation took a considerable time due to its complexity. Upon righting the dozer Mr Houston was observed in the dozer cab and was showing no signs of life. Mr Houston was declared life extinct at 10:30am, 1 January 2019 by QPS Officers.

Mr Houston had been in the coal industry for over 15 years and had worked at several different mine sites in the Bowen Basin operating dozers. He was working his fifth shift of seven rostered twelve hour shifts and was approximately four hours into the shift. The weather conditions at the time of the incident were fine.

The Inspectorate's investigation identified several major contributing factors to Mr Houston's workplace death.

1. There were significant issues with the loading of explosives for the blasts at Ramp 2 North. This resulted in a poor blast profile and large unfractured pieces of rock on the surface area. This made the operation of dozers difficult and potentially hazardous.
2. There was a hazard of water in the pit below where Mr Houston was working. This hazard was raised by Coal Mine Workers at Ramp 2 North with their respective supervisors, but the hazard was not managed. The area supervisors did not enter the hazard of the water into the 1SAP reporting system.
3. The activities at Ramp 2 North were not being conducted in the manner stated in the safe work instruction, creating additional hazards. No risk management process was applied to effectively manage this hazard.
4. The safety berm along the excavation edge was not constructed or maintained to the size required by the site Safety and Health Management System.
5. The dozer operated by Mr Houston was not fitted with MineStar which meant he did not have access to the safety features it can provide.

2. Jurisdiction and Scope

Investigations of serious accidents at coal mines is a function of the Mines Inspectorate as required under Section 128 of the Coal Mining Safety & Health Act 1999.

Section 199 of the Coal Mining Safety & Health Act 1999 states that as soon as practicable after receiving a report of a serious accident causing death at a coal mine, an inspector must inspect the place of the accident, investigate the accident to determine its nature and cause, and report the findings of the investigation to the Chief Inspector.

2.1. Details of the deceased

Name	
Date of Birth	
Age	
Residential address	
Occupation	
Employer	
Cause of Death	
Next of Kin	
Relationship to Deceased	
Address Next of Kin	

2.2. Health Details

Mr Houston was taking prescribed medication at the time of the incident. The results of the toxicology report¹ indicated that the only drugs present in Mr Houston's system were

The autopsy report² stated that the toxicology analysis detected these drugs at a non-toxic level. These types of drugs were consistent with the medical declaration³ provided by Mr Houston to the Saraji Mine on the 11 July 2016.

3. Incident Details

At approximately 10:30pm on the 31 December 2018, Mr Allan John Houston was fatally injured in an incident at the Saraji Coal Mine. Mr Houston was operating a dozer when it rolled down an excavation before coming to rest on its roof in a body of water and mud⁴. Mr Houston was one of three dozer operators assigned to the task of performing dozer push activities as part of a dragline bench preparation at Ramp 2 North.

¹ Appendix - [TOX - HOUSTON.pdf](#)

² Appendix - [10347919 - Form 8 autopsy report - HOUSTON Allan.pdf](#)

³ Appendix - [Medication Declaration Houston Allan 11 07 2016.pdf](#)

⁴ Appendix - [Pit Water Photo 3.JPG](#)

Mr [redacted] was working at the southern end of the work area, Mr [redacted] was working to the northern end, and Mr Houston worked between these two operators.

During the time preceding the incident, the dozers were moving overburden material away from the high wall and pushing it around and across the bench towards the edge.

The work group had agreed earlier to break for lunch at approximately 10:30pm. Both Mr [redacted] noticed Mr Houston leaving the work area and assumed it was time for a lunch break⁵.

As Mr Houston was tramming past the front of Mr [redacted] dozer, he made a change of direction to his left. He then travelled approximately 15 metres in this direction, driving over the edge into the excavation below.

Mr [redacted] witnessed this and immediately moved his dozer over to the location, exited the machine and looked over the edge. He called out to Mr Houston but did not receive a response. He returned to his dozer and called in the emergency⁶.

The site's Emergency Response Team responded. There was no machine access into the pit so dozers were used to form tracks down to enable a rescue. The rescue required slings to be placed on Mr Houston's dozer, so that it could be towed back onto its tracks by the other dozers.

Mr Houston's dozer was brought back into an upright position⁷ at approximately 12:20am. Access to the dozer cabin was made by paramedics, who at approximately 12:25am found no signs of life. Mr Houston was declared life extinct⁸ by the QPS at 10:30am, 1 January 2019.

4. Mine Site Details

Mine Name	Saraji Mine
Tenure Holder	BHP Coal Pty Ltd
Mine Operator	BM Alliance Coal Operations Pty LTD
Operator's Representative	
Mining Lease	ML 1775, ML 1782, ML 1784, ML 2360, ML 2410 ML 70126, ML 70127, ML 70294, ML 70298, ML 70325, ML 70328, ML 70369, ML 70370
Site Senior Executive	Mr BOE-SSE/16/015
Contact details of Site Senior Executive	

⁵ Appendix [redacted] Line 75

⁶ Appendix [redacted] Line 75

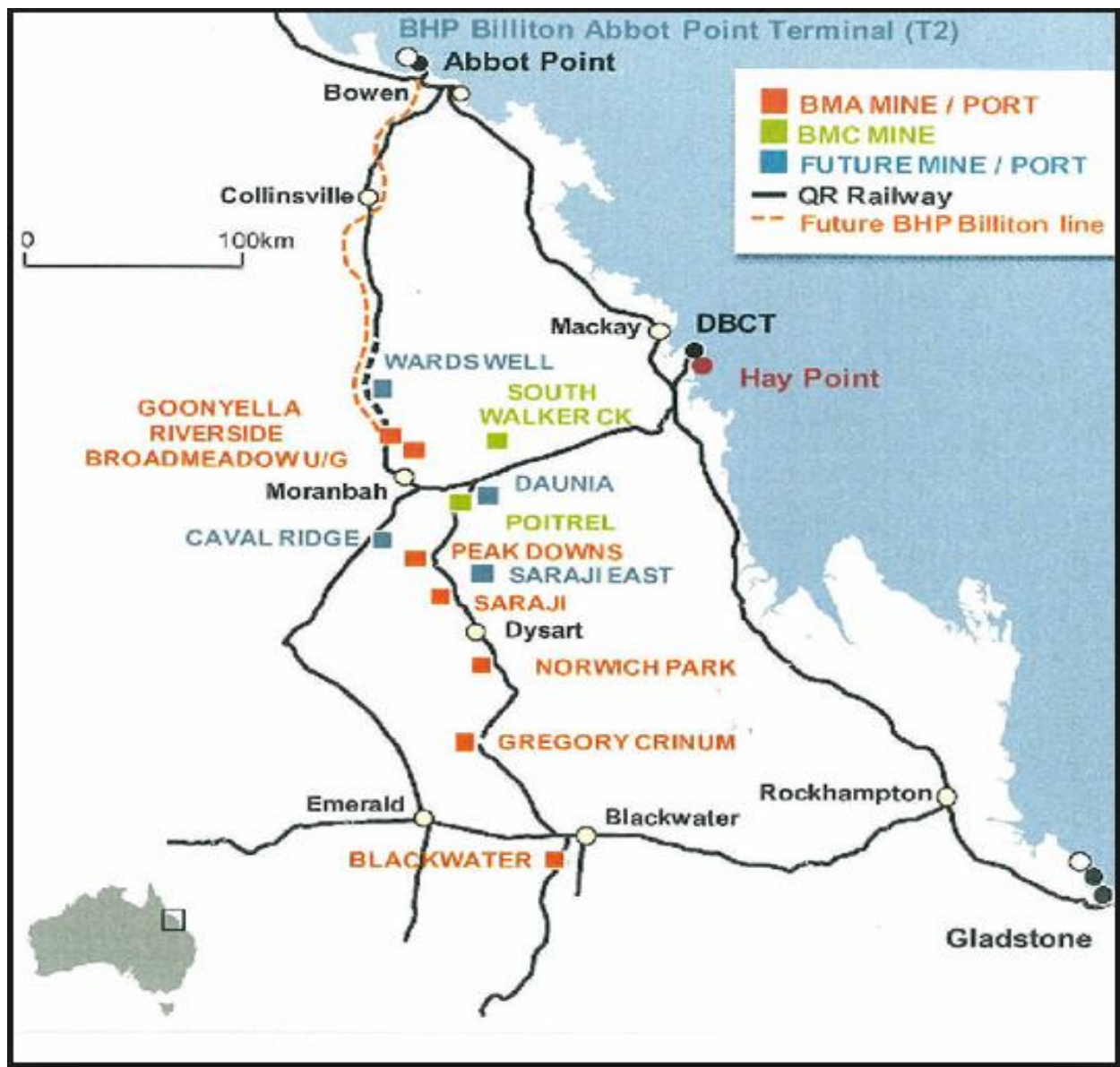
⁷ Appendix - [Emergency Response Photo 3 31012018.JPG](#)

⁸ Appendix - [Life Extinct Form Houston 01012019.pdf](#)

4.1. Saraji Mine Location Details.

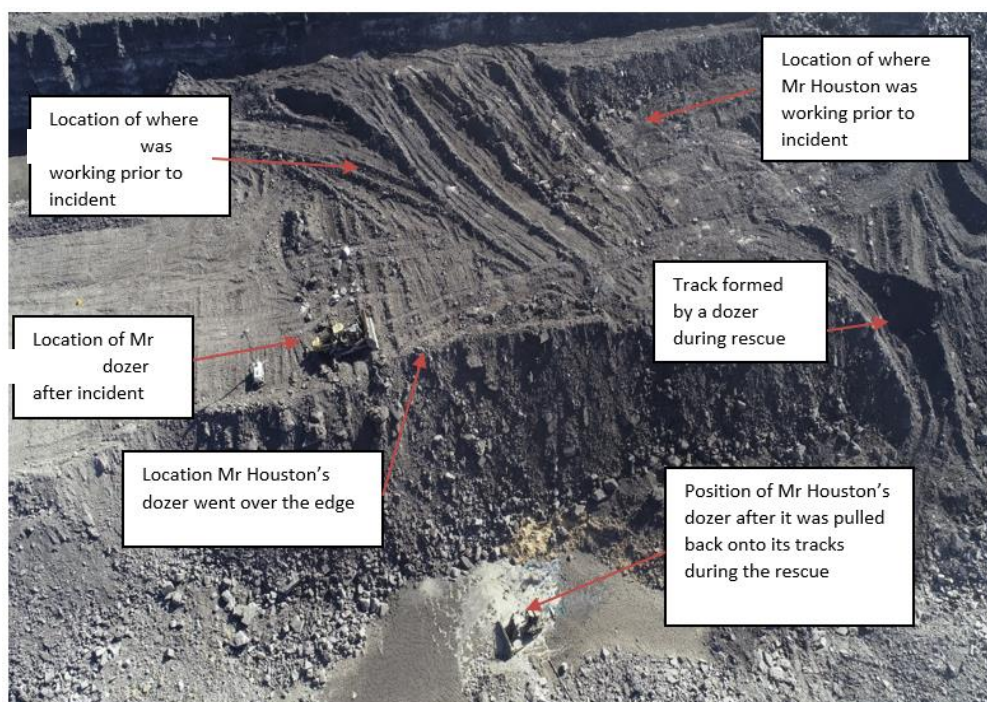
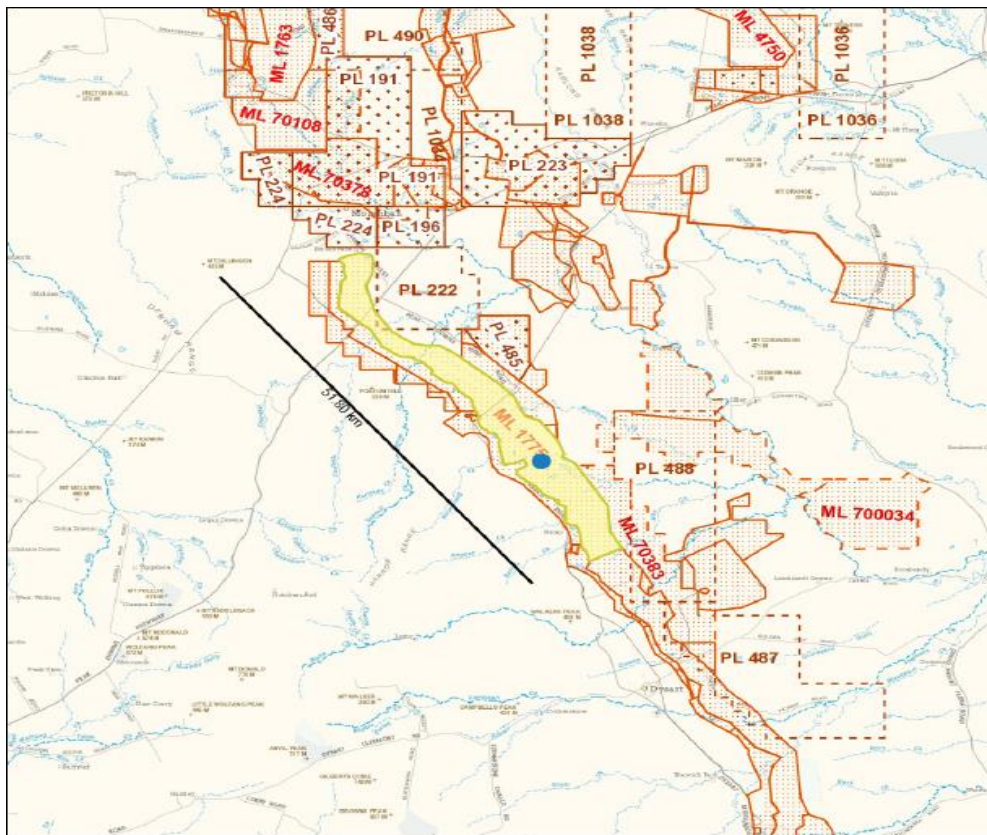
The Saraji Mine site is located approximately 200 kilometres southwest of Mackay in the Bowen Basin in Central Queensland. The mine is serviced by the nearby town of Dysart.

The Saraji Mine is an open cut coal mine producing coking coal. The mine employs approximately 530 permanent workers and 990 contract employees.



5. Incident Location

The incident occurred at the dozer push operations at Ramp 2 North which is located on Mining Lease 1775⁹.



⁹ Appendix - [ML 1775 Resource authority departmental report.pdf](#)

6. Incident Notification and Response

6.1. Notification of Incident.

At 1:40am on the 1 January 2019 Mr (Site Senior Executive), contacted the on-call Mines Inspector Mr Rob Sherwood. Mr advised that a dozer had trammed over the bunded spoil edge and rolled down the excavation before coming to rest in a body of water.

6.2. Notification of Next of Kin

Mr next of kin was listed as his mother who resided in Officers from the Queensland Police Service attended the address and initially were not able to raise anyone. They returned later the same day and advised Mr Houston's mother of the incident.

6.3. Emergency Response

The incident was raised by at approximately 10:30pm after he observed Mr Houston's dozer go over the edge into the excavation below¹⁰. initially tried to contact Mr Houston by calling out to him. There was no response so he called the emergency on the mine radio¹¹.

The Mine's Emergency Response Team responded immediately and were at Ramp 2 North within approximately 13 minutes. Open Cut Examiners also responded within the same time frame. The responders found no direct access to the pit below so they walked into the pit via a track on the adjacent wall. They observed the dozer had come to rest on its roof in a body of mud and water^{12 13 14 15}. Dozers were then used to push an access road down to where Mr Houston's dozer had come to rest.

Additional dozers were brought to the incident scene and used large slings to pull the dozer back onto its tracks. This occurred at approximately 11:30pm. An earth bridge was formed across to the dozer to enable safe access. Emergency Response Team members accessed the dozer and found Mr Houston to have no signs of life a 12:25am.

The investigation found that the rescue was conducted professionally considering the difficult circumstances. Concerns were raised by the first responders regarding the difficulty in communicating by two-way radio with Mine Control, which is situated in Brisbane. They were also heavily critical of the emergency alarm being repeated over the two-way radio¹⁶. This alarm made it difficult and in some cases impossible to maintain effective communication between responders. The issue was when the responders were trying to communicate, the emer m would come in over the top and cut out the conversation.

¹⁰ Appendix - [ROI - .pdf](#) – Line 75

¹¹ Appendix - [Emergency Response Radio Ch4 31122018.WAV](#)

¹² Appendix - [Emergency Response Photo 1 31012018.JPG](#)

¹³ Appendix - [Pit Water Photo 3.JPG](#)

¹⁴ Appendix - [Emergency Response Photo 2 31012018.JPG](#)

¹⁵ Appendix - [Emergency Response Photo 3 31012018.JPG](#)

¹⁶ Appendix - [Emergency Response Radio Ch4 31122018.WAV](#)

7. List of Persons named in the report

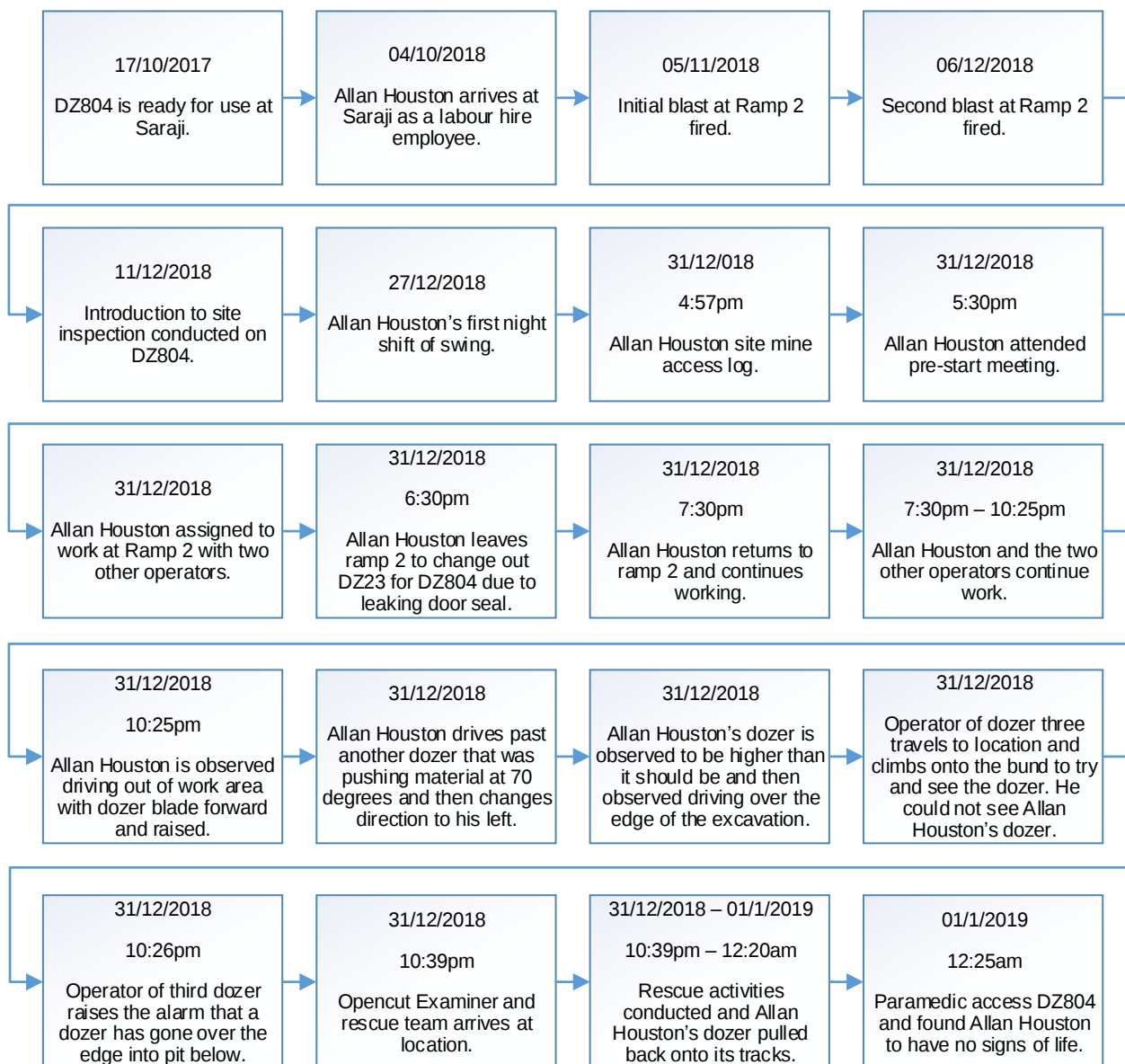
Name	Occupation	Company
Allan Houston (deceased)	Dozer Operator	Workpac
	Dozer Operator	Hayes
	Dozer Operator	BMA
	Supervisor	BMA
	Open cut Examiner	Hayes
	Open cut Examiner	Hayes
	Operator	Mickala Mining
	Dozer Operator	Hayes
	Supervisor	BMA
	Inspector of Mines	DNRME
	Inspector of Mines	DNRME
	Inspector of Mines	DNRME
	Principal Investigations Officer	DNRME
	Inspector of Mines	DNRME
	Site Senior Executive	BHP
	Mechanical Superintendent	BHP
	Lighting Engineer	Rubidium Light
	Inspector of Explosives	DNRME
	Inspector of Explosives	DNRME

8. List of abbreviations

1SAP	Systems, Applications and Products
ECM	Electronic Control Module
ERT	Emergency Response Team
ET	Electronic Technician
ICAM	Incident Cause Analysis Method
PRO	Procedure
PWM	Pulse width Modulator
QPS	Queensland Police Service
ROPS	Roll over protection system
SOP	Safe Operation Procedure
SRM	Saraji Mine
STD	Standard
SWI	Safe Work Instruction
UQMP	University Queensland Materials Performance

9. Investigation

9.1. Time Line



10. Dozer 804 Details

Make	Caterpillar
Model	D11T Dozer
Serial Number	GEB00208
Reference Number	DZ804
Service Meter Unit Reading at time of incident	3867 Hrs
Total Machine Odometer Reading	30767 Hrs (Major Rebuild @ 26900 Hrs)



Photograph of DZ804 prior to incident.

The dozer was owned by Comiskey Mining Services and was on hire to Saraji Mine by a third party. An introduction to site document was completed by the Saraji Mine before the dozer was used on site. This checklist¹⁷ did not include the requirement for the dozer to be fitted with MineStar. CAT MineStar is an equipment management system that has five configurable features to manage and report on the equipment performance as well as safety feature. All Saraji Mine owned and operated equipment have MineStar fitted.

¹⁷ Appendix - [DZ804 BMA Compliance 16102017.pdf](#)

11. Component Testing

Dozer components were removed by Hasting Deering and taken to their Rockhampton workshop for testing. The removal and testing was supervised by Patrick Hurley, Inspector of Mines and , BMA Superintendent. The intent of the testing was to verify that the dozer was functioning as designed at the time of the incident.

Historical work orders were sourced and machine repair history was consolidated into a summary:

- Major overhaul of machine was undertaken by Teknoxgroup Slovenija d.o.o. at 26900 Hrs. (Prior to purchase of Machine by Comiskey Earthmoving) which reset machine hours to zero
- Transmission and final drives were overhauled by Sharps Heavy Equipment Repairs 03.12.2017 (108 Hrs)
- Resealed LH pivot shaft 01.04.2018 (1458 Hrs)
- Routine servicing appeared to be adequate and timely.

11.1. Final Drive Axles

The final drive axles, (inner and outer), were removed during the machine recovery process. The removal of the axles allowed the final drive components, (steer and brake packs), to rotate independently to the transmission whilst the machine was being towed.

Result - All four axles were in good condition, normal wear was apparent on the splines.

11.2. Electronic Control Modules

The electronic control modules (ECM) make decisions that are based on input information and memory information. After the ECM's receive the input information, the ECM's send a corresponding response to the outputs. The inputs and outputs of the ECM are connected to the machine harness by two 70 contact connectors (J1 and J2). The Vimms / Product Link ECM sends the information to the Caterpillar Electronic Technician on the Cat Data Link.

11.3. Vimms / Product Link ECM

The Vimms / Product Link ECM was removed from the machine. Information was downloaded from the unit utilising Cat Electronic Technician (ET).

The Vimms / Product Link unit receives data from all on-board ECM's and holds the information for download. If the unit is setup with Vimms software it is capable of logging real time activity, engine speed, gear selection, engine temperatures etc.

As the unit was equipped with only basic software, the data received was limited to logged events from the on-board ECM's. No live data was stored in the unit or transmitted.

Result - There were no events logged that would affect the operation of the machine.

11.4. Engine ECM

Information was downloaded from the unit utilising Cat Electronic Technician (ET). The Engine ECM is attached the RH side of the engine and records information relative to the engine operation, engine RPM, temperature, oil pressure, and logs events that would affect the engines performance.

Result - There were no events logged that would affect the operation of the machine.

11.5. Power Train ECM

Information was downloaded from the unit utilising Cat Electronic Technician (ET). The Power Train ECM is located behind the seat in the operator's cabin and records information relative to the power train operation, torque convertor oil temperature, transmission pressures, temperatures, gear selection, brake and clutch pressures, park and reverse switch, and temperatures.

Result - There were no events logged that would affect the operation of the machine.

11.6. Implement ECM

Information was downloaded from the unit utilising Cat Electronic Technician (ET). The Implement ECM is located behind the seat in the operator's cabin and records information relative to the implement operation, hydraulic oil temperature, main pump pressure, tilt pump pressure, and blade and ripper controls.

Result - There were no events logged that would affect the operation of the machine.

11.7. Decelerator Pedal (PWM type)

The pedal was tested utilising Cat Electronic Technician (ET) and a powered Fluke meter. The test comprised of a static test of the pulse width modulation switch, and an in situ test utilising the engine ECM and test bench controls. The pedal is located in the operator's cabin and operation is as follows:

- Push down on the pedal in order to override the throttle control. This action will reduce the engine speed. Use the pedal in order to reduce the engine speed when you make a directional shift.

Result - There were no faults identified that would affect the operation of the machine.

11.8. Service Brake Pedal (PWM Type)

The pedal was tested utilising Cat Electronic Technician (ET) and a powered Fluke meter. The pedal is located in the operator's cabin and operation is as follows:

- Applying the Brake Pedal - Push the brake pedal downward in order to apply the service brakes. Use the brake pedal in order to slow the machine and stop the machine. Use the service brakes on a downgrade in order to prevent over speed. The service brakes are especially needed when you change directions on a steep slope.
- Releasing The Brake Pedal - Release the brake pedal in order to allow the machine to move. Release the brake pedal in order to increase the ground speed.

Result - There were no faults identified that would affect the operation of the machine.

11.9. Left Hand & Right Hand Steer Levers (PWM Type)

The levers were tested utilising Cat Electronic Technician (ET) and a powered Fluke meter. The levers are located in the operator's cabin: There are two steering clutch/brake levers. The lever on the left controls the left steering clutch/brake. The lever on the right controls the right steering clutch/brake. Operation of Steering Clutch and Brake Lever (1 or 2):

Pull the lever backward. This disengages the steering clutch. This will also steer the machine to the left by slowing down or stopping the left track. The turning radius is controlled by the force that is exerted on the lever. When you exert more force on the lever, the turning radius will be smaller. When you feel pressure, the steering brake begins to engage. Pull the lever backward. This applies the brake for a pivot turn.

Result - There were no faults identified that would affect the operation of the machine.

11.10. Summary of component testing

The testing of all components was carried out under controlled conditions at Hasting Deering CAT Workshop 1/152 Port Curtis Rd, Port Curtis QLD 4700.

The technicians utilised to carry out the inspections were competent, experienced, and skilled tradespersons.

All components tests were conclusive of normal system operation, there were no recorded events in either report^{18 19}, or defects found that would have affected the machines performance.

11.11. Dozer Equaliser Bar

Following the recovery of Dozer 804, it was identified that the equaliser bar was broken. The equaliser bar is located under the front section of the dozer. It is made of solid cast steel and weighs approximately 710kg. It is attached by pins and bushes to the main chassis and to each track frame. The purpose of the equaliser bar is to support the front of the dozer, and transfer weight from the chassis through the track frames onto the ground.

The University Queensland Materials Performance (UQMP) was engaged to conduct an analysis of the equaliser bar to understand whether the failure occurred prior to the incident, (which may have influenced the dozers handling), or occurred during the incident. The testing was conducted by laboratory examination and analysis at the University of Queensland.

The examination and analysis conducted by UQMP²⁰ found that the equaliser bar would not have broken during normal operation. The dynamics of the dozer rollover would have supplied sufficient force to break the equaliser bar and therefore it is responsible to assume the failure occurred during the incident.

¹⁸ Appendix - [HDAL Report_BMA Saraji_DZ804 D11T GEB00208_04Feb2019.pdf](#)

¹⁹ Appendix - [Saraji D11T Dozer Mechanical Inspection.pdf](#)

²⁰ Appendix - [C03881-001_BMA Saraji D11T Equalizer Bar_Report.pdf](#)

12. MineStar

CAT MineStar is an equipment management system that has five configurable features to manage and report on the equipment performance as well as safety feature. All Saraji Mine owned and operated equipment have MineStar fitted. Dozer 804 operated by Mr Houston was a hire dozer and was not fitted with MineStar but had the capability for it to be fitted. One of the features is titled “Detect” and has the following capabilities:

1. A combination of radars, cameras and an in-cab display, “Detect” provides equipment operators with enhanced awareness of the immediate environment.
2. The ability to setup a Geo-fence around the equipment work area that will alert the operator if they are approaching a hazard such as a misfire or excavation edge. The system also has the ability to shut down the equipment if it breaches the Geo-fence.
3. Proximity awareness alerts if the machine comes in close proximity to another piece of equipment.
4. The in-cab display allows the operator to visually identify their machines’ location in the work area.

There were three dozers operating at Ramp 2 North on the night of the incident. One of the dozers was a Saraji owned machine and was fitted with MineStar. This dozer was positioned on the eastern section of the work area as there had been three misfires identified in that area. With survey data uploaded onto the MineStar system, this enabled the operator to visually identify the machines location in relation to these misfires. The system can also alert the operator if they approach a misfire. The MineStar system also provides visual information on the in-cab display as to what RL they are operating at.

A dozer fitted with MineStar provides the operator with safety features that can alert them to hazards, such as being in close proximity to the excavation edge.

13. Lighting

Lighting was provided to the Ramp 2 North dozer push by two mobile lighting plants. These lighting plants were situated on the adjacent high wall. Additional lighting was provided to the work area by the dozers on board external lights. Interviews conducted found that the workers believed that the lighting in the area was adequate for the task being conducted^{21 22}.

A re-enactment^{23 24} was conducted of the conditions at the time of the accident. Inspector Callinan and Principal Investigations Officer Tolhurst conducted illumination testing. The first readings were conducted in the area around a dozer similar to dozer 804. The illumination readings were taken at different levels and locations to determine the amount of the illumination in dozer 804 operation area. The second series of tests were conducted while a second dozer was positioned in the slot adjacent to dozer 804. This dozer was positioned as it would have been at the time of the incident and was operating during the testing.

²¹ Appendix - Line 304

²² Appendix - Line 282

²³ Appendix - [Re-enactment of Incident Scene 1.MOV](#)

²⁴ Appendix - [Re-enactment of Incident Scene 2.MOV](#)

Rubidium Lighting Engineers was engaged to examine photos, videos, and lighting plant data to assist in determining the adequacy of the artificial light. In the summary of their report²⁵, it states that from the photographs provided, it appears that the portable lighting towers located on the bench above the incident site provided good orientation lighting and assisted in revealing the edge of the working area.



Position of dozers during illumination testing.



Photograph of area where dozer 804 drove over edge showing lighting.

²⁵ Appendix - [QGM0001- SARAJI LIGHTING REPORT - FINAL.pdf](#)

14. Ground conditions and work area

The work being conducted at the time of the incident was the preparation of an area for a dragline to walk onto. It would then remove the interburden and expose the coal seam. Before this occurs the work area is fired using large amounts of explosives. Dozers are then used to level the ground and form the bench.

The Ramp 2 North area was fired in two sections. The first section was fired on the 5 November 2018²⁶ and the second on the 6 December 2018²⁷. The shot design is developed as to cause fragmentation of the interburden material to enable easy removal by the draglines and for the dozers and excavators when constructing the benches.

A review of the blasting records by Inspector of Explosives Mr Peter Naumann and Inspector of Explosives Mr Rodney Keane identified significant issues with the explosive loading process. A large number of the holes had slumped before being loaded with the explosives. Due to the presence of ground water the explosive product had washed out requiring additional product to be loaded.

Due to a change in the site blasting schedule for the first section of the blast, explosive product was left in the ground for longer than the recommended time prescribed by the manufacturer. As a result this affected the performance of the blasting product.

Ground water was present in the interburden material as well as in the pit adjacent to the bench that was to be blasted. The shotfirer raised concerns²⁸ about the presence of the pit water as it is poor practice to blast a shot over and into water. The blasting schedule did not allow time for the water to be pumped out prior to the blast.

As a result of the loading issues, the blast was not as effective as design expectations which resulted in a poor blast profile and large unfractured pieces of rock on the surface area. This made the operation of dozers difficult and potentially hazardous. This was confirmed during interviews of dozer operators^{29 30 31 32}. The operators were continually driving over these large pieces of rock and uneven ground during their shift.³³

Contained within the interburden material was a small seam of coal. On firing the shot the coal was broken up and distributed throughout the material being dozed to prepare the dragline bench. The presence of this coal made the work area dusty. Operators stated that the dust impacted on their visibility, and on occasions entered the dozer cab through leaking seals^{34 35 36 37 38}.

²⁶ Appendix - [Blast Image Prior to Incident_05112018_02_46D24_DOB_02.mpg](#)

²⁷ Appendix - [Blast Image Prior to Incident_06122018_02_46D24_DOB_03.mpg](#)

²⁸ Appendix - [BMA Form - Daily Shotfirer Report \(15102018 - 04112018\).pdf](#) - See reports dated 16/10/18, 03/11/19, 04/11/19

²⁹ Appendix - Line 75

³⁰ Appendix - - Line 237 & Line 306

³¹ Appendix - ine 316

³² Appendix - Line 266

³³ Appendix - [12019.MOV](#)

³⁴ Appendix - Line 75 & Line 265

³⁵ Appendix - - Line 112 & Line 306

³⁶ Appendix - ine 328 & Line 336

³⁷ Appendix - Line 266

³⁸ Appendix - - Line 259 & Line 380

On the night of the incident Mr Houston changed out dozers as the original one he was operating was leaking dust in through the operator cabin doors. Mr stated that while traversing across the work area to obtain fuel, he had to stop as the dust was so bad it restricted his vision³⁹.

15. Presence of water

The dozer operation was being conducted on a bench approximately 18 metres above a pit containing water and mud. Prior to the blasting that occurred on the 5 November 2018, attempts were made to pump the water from this location. At the time of the shot being fired there was still a large volume of water in the pit⁴⁰.

Concerns were raised by the shotfirer about the presence of the water and the impact its presence will have on the shot. Due to scheduling demands, the water was not pumped out before the shot was fired.

The presence of the water and the hazard it presented, was raised by the Coal Mine Workers^{41 42} with their supervisors. In turn the supervisors raised the concerns with their relevant superintendents. This was only communicated verbally^{43 44}. The hazard of water should have been entered onto the 1SAP system so it could be monitored until the hazard has been managed.

16. Training and Assessment

There were two key Safety and Health Management System documents that were directly specific to the task being conducted at Ramp 2 North. The first being the SWI Bulk Push Dozer Operations and the second was the STD Working in and Around Water.

No evidence could be found that Mr Houston⁴⁵, Mr ⁶ or Mr ⁷ had been trained and assessed in these documents⁴⁸.

17. Safety and Health Management System

17.1. SRM SWI Bulk Push Dozer Operations (SRM-SWI-0231)

This safe work instruction⁴⁹ details the standard of all work associated with bulk dozer push operations. The document also mentions additional Standards and Standard Operating Procedures that should be referenced prior to undertaking activities.

³⁹ Appendix - [f – Line 112](#)
⁴⁰ Appendix - [Blast.JPG](#)
⁴¹ Appendix - [– Line 414 & Line 415](#)
⁴² Appendix - [– Line 170 & Line 171 & Line 181 & Line 182 & Line 400](#)
⁴³ Appendix - [– Line 268 & Line 278 & Line 284](#)
⁴⁴ Appendix - [f – Line 360 & Line 362 & Line 366 & Line 368](#)
⁴⁵ Appendix - [3482 Training Transcript.pdf](#)
⁴⁶ Appendix - [20 Training Transcript.pdf](#)
⁴⁷ Appendix - [27 Training Transcript.pdf](#)
⁴⁸ Appendix - [RESPONSE - Notice of Document Production Requirement Training.pdf](#)
⁴⁹ Appendix - [SRM SWI Bulk Push Dozer Operations.pdf](#)

The Saraji Safety and Health Management System stipulates that this document should have been used for the activities being conducted at Ramp 2 North. Interviews with Coal Mine Workers found that they believed that this document was not specifically applicable for the task^{50 51 52}.

Section 2.2 of this document requires that dozer push slots are to be cut parallel to each other. Investigation evidence found that on the night of the incident, not all of the slots were being cut parallel. The training document also states that the slots are to be driven square to the highwall⁵³. By following this process the blade of the dozer is always at 90 degrees to the edge.

A blade of material is to be left at the edge and then pushed over with the second blade and repeated⁵⁴. With a dozer blade being approximately two metres in height that would result in a two metre high bund being left on the edge. Investigation evidence found that on the night of the incident the bunding was significantly lower.

Section 2.4 of this document requires that an excavator will scale the highwall to design and dig a trench next to the highwall. This will ensure the dozers do not side cut the high wall. Investigation evidence found that on the night of the incident and prior to, there was no excavator used and dozers had been side cutting the high wall^{55 56}.

17.2. SRM SWI Pushing over a Highwall or Highwall Bench (SRM-SWI-5812567)

This document⁵⁷ should have been referenced before conducting the activities at Ramp 2 North. It is referenced in SWI Bulk Push Dozer Operations.

Section 3 of this document requires that a dozer must maintain a bund at the end of the push and for it to be at least half the wheel height of the largest machine in the work area. It also requires that the dozer must push material over the face and not travel along parallel at the toe of the rill⁵⁸.

17.3. SRM STD Working in and Around Water (SRM-STD-0016)

This document⁵⁹ specifies the minimum requirements for controlling hazards associated with working in and around water or other liquid hazards. The standard applies to any activity involving working in and around water or other liquid hazards where there is no hard barricading in place.

⁵⁰ Appendix - – Line 195 & Line 221 & Line 227
⁵¹ Appendix - – Line 204 & Line 222
⁵² Appendix - – Line 165 & Line 175 & Line 177 & Line 185
⁵³ Appendix - – Line 452
⁵⁴ Appendix - – Line 448
⁵⁵ Appendix - – Line 151
⁵⁶ Appendix - – Line 177 & Line 181
⁵⁷ Appendix - [Highwall or Highwall Bench.pdf](#)
⁵⁸ Appendix - – Line 405 & Line 407
⁵⁹ Appendix - [SRM STD Working In and Around Water Standard.PDF](#)

It applies to all persons conducting work where there is a risk of immersion, entrapment, or entry into any body or structure that contains water or other liquid hazards. Examples may include water in mining pits, particularly after heavy rain.

Section 5 of this document requires when working in and around water or other liquid hazards, where there may be a risk of immersion or drowning, the appropriate level of risk management must be applied in accordance with SRM PRO Risk Management Procedure.

A risk management process must be conducted^{60 61} where there is a requirement for plant and equipment to operate in and around water or other liquid.

17.4. SRM PRO Risk Management Procedure (SRM-PRO-0056)

This document⁶² outlines the different levels of the risk management process that needs to be applied for managing risk of tasks. An example of use is that if additional hazards are identified that are not readily covered in the Safe Work Instruction, a risk assessment is to be conducted.

	Hazard Identification Tools	Risk Assessment Tools		
	BMA Safe – BMA	Job Step Analysis / Risk Assessment- BMA (includes risk scoring)	Workplace Risk Assessment and Control (WRAC - Excel template)	Stature Bow Ties
Examples of Use	Personal hazard identification tool (not a risk assessment).			
	Used to control hazards for inspection tasks only.			
	Completed prior to all manual or operational tasks			
	Review when change occurs, new hazards are identified or a new activity starts in the area around the task			

The requirements of the procedure should have been followed when the hazards of the water was raised. The STD Working in and Around Water states that the appropriate risk management must be applied where there may be a risk of immersion or drowning.

⁶⁰ Appendix -

⁶¹ Appendix -

⁶² Appendix -

- Line 366 & Line 368 & Line 425

- Line 414 & Line 415

[nt Procedure.pdf](#)

The requirements of the procedure should have been followed when it was identified that SRM SWI Bulk Push Dozer Operations was not specifically relevant to the task being conducted. As a result not all risks were managed.

17.5. SRM SOP 100 Work Place Inspections (SRM-SOP-100)

This Standard Operating Procedure⁶³ outlines the process to identify hazards and conditions upon entry into various work areas to reduce the risk of injury to people or damage to equipment and control access to hazardous areas.

Section 2.4 Supervisor Inspections:

- Supervisors must complete formal inspections of active work areas at a minimum once per shift; based on risk and area conditions the frequency of inspections may increase.
- All hazards should be logged in 1SAP, where a hazard cannot be rectified within the shift the hazard must be logged in 1SAP with a corrective action assigned. The supervisor must inform the OCE of hazards and controls.
- Supervisors must ensure the relevant information about all hazards and controls, in addition to the OCE inspections report have been communicated to the oncoming shift.

The hazards of water, dust, and rough conditions present at Ramp 2 North were raised by Coal Mine Workers with their Supervisors. These hazards were not recorded in the supervisor's inspection report or in 1SAP⁶⁴.

Supervisors are required to complete a report at the end of each shift^{65 66 67 68}. The review of these reports completed by supervisors at Ramp 2 North, found no record of these hazards being reported during the shift. There was also a consistent failure to conduct / record the reports safety requirements.

17.6. SRM SOP 020 Design and Construction Safety Berms

This document⁶⁹ should have been referenced before conducting the activities at Ramp 2 North as it provides the dimensions for safety berms in specific conditions as outlined in section 2. Section 1 states to ensure safety berms as vehicle safety barriers, are constructed and maintained to provide suitable protection at road edges and edges of drop-offs.

The safety berm height where Mr Houston's dozer went over the edged ranged from .805 metres to 1.368 metres. The survey average of the safety berm height for this location was 1.117 metres.

⁶³ Appendix - [SRM SOP 100 Workplace Inspections.PDF](#)

⁶⁴ Appendix - [HAZ NOV DEC 2018.pdf](#)

⁶⁵ Appendix - [Supervisor Report.pdf](#)

⁶⁶ Appendix - [Supervisor Report 2.pdf](#)

⁶⁷ Appendix - [Supervisor report 3.pdf](#)

⁶⁸ Appendix - [Supervisor report 4.pdf](#)

⁶⁹ Appendix - [SRM SOP 020 Design and Construct Safety Berms.pdf](#)

18. ICAM

A BHP systematic safety investigation analysis method called Incident, Cause, Analysis, Method (ICAM) was undertaken by Mr Callinan, Mr Bulger, Mr Hurley and Mr Tolhurst, to identify local factors and failures within the broader organisation and productive system (e.g. communication, training, operating procedures, incompatible goals, organisational culture, equipment, etc.) which contributed to the accident.

Through the analysis of this information, ICAM provides the ability to identify deficiencies and to prevent recurrence. This method was used to present the accident findings in terms of:

18.1. Absent / failed defences

These failures result from inadequate or absent defences that failed to detect and protect the system against technical and human failures. These are measures which did not prevent the outcome or mitigate the consequences of an individual or team action that resulted in an incident or near miss.

- ❖ The safety berm was not of adequate size to prevent a dozer from traveling over the edge.
- ❖ The Safe Work Instruction was not adequate for the task being conducted.
- ❖ The Coal Mine Workers were not trained in the Safe Work Instruction “SRM-SWI-0231 Bulk Dozer Push Operations”.
- ❖ The risk assessment conducted for the development of the Safe Work Instruction “SRM-SWI-0231 Bulk Dozer Push Operations” did not identify all steps.
- ❖ There was no additional risk assessment conducted for working near a body of water as required by “SRM-STD-0016 Working In and Around Water”.
- ❖ The Coal Mine Workers were not trained in “SRM-STD-0016 Working In and Around Water”.
- ❖ The Open Cut Examiners and supervisors did not conduct a visual inspection of the work area.
- ❖ The dozer operated by Mr Houston was not fitted with MineStar.
- ❖ The hazards reported to the supervisors were not recorded on 1SAP.
- ❖ The hazards reported to the supervisors were not documented.
- ❖ The hazards reported to the superintendents by the supervisors were not recorded or actioned.

18.2. Individual / team actions

These are the errors or violations that led to the incident. They are typically associated with personnel having direct contact with the equipment, such as operators and maintenance personnel. They are always committed ‘actively’ (someone did or didn’t do something) and have a direct relation with the incident. Human error types are slips, lapses, mistakes, and violations.

- ❖ Mr Houston did declare the medication he was taking.
- ❖ The Open Cut Examiners and supervisors did not conduct a visual inspection of the work area.
- ❖ The dozer operator did not push material at 90 degrees to the edge of the excavation as required by Safe Work Instruction.
- ❖ Mr Houston drove his dozer close and parallel to the edge of the excavation.
- ❖ The Coal Mine Workers did not identify the hazard of water while conducting their personnel risk management (BMA Safe).
- ❖ The supervisors did put controls in place to address the hazards reported to them by the Coal Mine Workers.
- ❖ The Coal Mine Workers conducted the task without a relevant Safe Work Instruction.

18.3. Task / environmental conditions

These are the conditions in existence immediately prior to or at the same time as the incident. These are the conditions that directly influence human and equipment performance in the workplace. These are the circumstances under which the errors and violations took place and can be embedded in task demands, the work environment, individual capabilities, and human factors.

- ❖ The Coal Mine Workers were not trained in “SRM-STD-0016 Working In and Around Water” or the Safe Work Instruction “SRM-SWI-0231 Bulk Dozer Push Operations”.
- ❖ There was water and mud present in the pit below the work area.
- ❖ The water in the pit was not removed before the blast was fired.
- ❖ The poor standard of the blast resulted in poor fragmentation.
- ❖ The conditions were dusty due to the presence of a rider seam of coal.
- ❖ The safety berm was not of adequate size to prevent the dozer from traveling over the edge.
- ❖ The task was being conducted on nightshift.
- ❖ The first section of the blast was not fired until after the recommended time that the explosive products can be left in the ground.
- ❖ The change of schedule for conducting the blast in Ramp 2 North reducing the effectiveness of the blast.
- ❖ There were large amounts of ground water present in the interburden that reduced the effectiveness of the blast.

18.4. Organisational factors

These are the underlying organisational factors that produce the conditions that affect performance in the workplace. They may lie dormant or undetected for a long time within an organisation and the repercussions may only become apparent when they combine with the local conditions and errors or violations to breach the system's defences. These may include fallible management decisions, processes, and practices.

Organisational Factor types:

TR	Training
OR	Organisation
PR	Procedures
DE	Design
RM	Risk Management
MC	Management of Change
CM	Contractor Management
IG	Incompatible Goals
HW	Hardware

- ❖ **TR-** the Coal Mine Workers were not trained in the Safe Work Instruction "SRM-SWI-0231 Bulk Dozer Push Operations".
- ❖ **TR-** the Coal Mine Workers were not trained in "SRM-STD-0016 Working In and Around Water".
- ❖ **TR-** the drill and blast engineer did not have the relevant competencies for the position.
- ❖ **RM-** there was no additional risk assessment conducted for working near a body of water as required by "SRM-STD-0016 Working In and Around Water".
- ❖ **RM-** the risk assessment conduct for the development of the Safe Work Instruction "SRM-SWI-0231 Bulk Dozer Push Operations" did not identify all steps.
- ❖ **RM-** the hazards reported to the supervisors were not recorded on 1SAP.
- ❖ **RM-** the Coal Mine Workers and Management did not comply with Risk Management Procedure "SRM-PRO-0056.
- ❖ **CO-** the two-way radio reception was poor in the Ramp 2 North area.
- ❖ **IG-** the Open Cut Examiners and supervisors did not conduct a visual inspection of the work area.
- ❖ **IG-** the change of schedule for conducting the blast in Ramp 2 North caused an issue with the effectiveness of the blast.
- ❖ **PR-** the supervisors did not fully complete the required inspection reports. Hazards reported to them were not recorded.
- ❖ **OR-** the inspection reports completed by the supervisors were not monitored to ensure effective reporting.
- ❖ **OR-** the Coal Mine Workers believed that Safe Work Instruction "SRM-SWI-0231 Bulk Dozer Push Operations" was not relevant to the task being conducted.
- ❖ **HW-** hire or contract dozers were not fitted with MineStar.
- ❖ **HW-** dozers on site fitted with MineStar do not have available safety features installed or activated.

19. Findings

19.1. Ground Conditions

Ground conditions at Ramp 2 North contributed to the incident for the following reasons:

- ❖ As a result of the issues loading the shot, the blast was not as effective as design expectations which resulted in a poor blast profile and large unfractured pieces of rock on the surface area. This contributed to making the operation of dozers difficult and potentially hazardous.
- ❖ The area was dusty due to the presence of a rider coal seam.
- ❖ The terrain was rough and uneven across the entire work area. Mr Houston had been operating over this uneven ground and large rocks for several shifts.
- ❖ The operators were not consistently pushing over the excavation edge but were moving material to level the area. This resulted in filling the void against the safety berm, which in turn resulted in lifting the bench height and reducing the effectiveness of the safety berm.
- ❖ While leaving the work area, Mr Houston travelled over this uneven ground which he had become familiar with and his dozer has travelled up and along the safety berm before rolling over the edge.
- ❖ The ground conditions and method of operation did not alert Mr Houston to the presence of the safety berm along the edge of the excavation.

19.2. Presence of water

The presence of water in the pit below where the dozer activity was being conducted was known^{70 71}. The shot firer raised the issue prior to the shot being fired and the adverse effect the water can have. Pumping was conducted prior to the shot being fired but ceased due to the schedule to conduct the blast.

The Coal Mine Workers working at Ramp 2 North raised concerns with their supervisors about the water and in turn the concerns were raised with superintendents. This hazard was not documented and not acted upon. There were significant opportunities to manage the hazard of the water at several levels.

The presence of the water was a major contributing factor in Mr Houston not surviving the dozer roll over.

⁷⁰ Appendix -
⁷¹ Appendix -

- Line 414
- Line 360 & Line 366 & Line 368

19.3. Safety and Health Management System Documents

SRM-SWI-0231 (Bulk Push Dozer Operations) was the procedure that the dozer operators at Ramp 2 North were believed to be working under. While there were some similarities between the document requirements and the activities being conducted, the task was not being conducted as stated^{72 73 74}.

The training document⁷⁵ that is applicable to this procedure requires dozers to cut parallel slots square to the high wall and to leave a full blade of material at the end of each push.

At the time of the incident, the dozers were pushing at random angles in an attempt to achieve the required level. The procedure states that an excavator will be used to cut away the material against the edge of the high wall. There was no excavator present which resulted in the dozers having to cut the material up against the edge of the high wall.

If the procedure was followed there would have been a full dozer blade of material at the excavator edge (2.1metres)⁷⁶ and all dozers would have had their blades presented 90 degrees to the edge.

SRM-STD-0016 (Working in and around water) - identifies the requirements that must be followed for activities being conducted in and around water. One requirement is that an appropriate level of risk management is applied before work commences. This requirement was not complied with, hence the hazard was not managed.

SRM-PRO-0056 (Risk Management Procedure) - this procedure outlines the different levels of the risk management process. It provides guidance for managing the risk of additional hazards not managed by a safe work instruction.

The activities at Ramp 2 North were not being conducted as required by the procedure. As a result the appropriate level of risk management⁷⁷ should have been applied and the required controls implemented to ensure an acceptable level of risk.

SRM-SOP-100 (Work place inspections) - requires supervisors to complete formal inspections of active work areas at a minimum of once per shift. In addition all hazards should be logged in 1SAP where a hazard cannot be rectified within the shift. The investigation identified that the relevant supervisors did not conduct a detailed visual inspection of the work area. As a result they did not identify that the activities were not being conducted as required by the safe work instruction. The hazard of water, dust, and rough ground conditions reported by Coal Mine Workers operating at Ramp 2 North were not recorded in 1SAP^{78 79}. Therefore these hazards were not managed.

⁷² Appendix - [pdf](#) – Line 165 & Line 175 & Line 177
⁷³ Appendix - [pdf](#) – Line 195 & Line 221 & Line 227
⁷⁴ Appendix - [pdf](#) – Line 160 & Line 173 & Line 208
⁷⁵ Appendix - [Push Operations Presentation.ppt](#)
⁷⁶ Appendix - [.pdf](#) – Line 448
⁷⁷ Appendix - [pdf](#) – Line 360
⁷⁸ Appendix - [pdf](#) – Line 380
⁷⁹ Appendix - [pdf](#) – Line 266 & Line 268 & Line 278 & Line 284

SRM-SOP-020 (Design and construction safety berms) - this document outlines the safety berm dimensions specific to a task and machinery. For Ramp 2 North the safety berm along the edge of the excavation should have been a minimum of 1.8 m high. Survey data from the incident area found that the safety berm⁸⁰ was below this height. The height of the safety berm was not sufficient to alert Mr Houston to the presence of the excavation edge. Thus it did not prevent Mr Houston's dozer from driving over and rolling into the excavation.

SRM- GDL-005 (Tracks Training Scheme)⁸¹ - the investigation found that key requirements of this scheme were not adhered to. There were two key safety and health management system documents that were directly specific to the task being conducted at Ramp 2 North. The first being the SWI Bulk Push Dozer Operations and the second was the STD Working in and Around Water.

No evidence could be found that Mr Houston, Mr [REDACTED] or Mr [REDACTED] had been trained and assessed in these documents. As result they were not given the opportunity to become familiar with the requirements of these procedures and comply with them.

19.4. MineStar

All Saraji owned and operated dozers are fitted with MineStar but dry hire dozers are not. There were three dozers assigned to the Ramp 2 North dozer push, only one was fitted with MineStar. The dozer operated by Mr Houston was not fitted with MineStar. If the dozer operated by Mr Houston was fitted with MineStar he would have had access to the following safety features:

1. A combination of radars, cameras and an in-cab display. Detect provides equipment operators with enhanced awareness of its immediate environment.
2. The ability to setup a Geo-fence around the equipment work area that will alert the operator if they are approaching a hazard such as a misfire or excavation edge. The system also has the ability to shut down the equipment if it breaches the Geo-fence.
3. Proximity awareness alerts if the machine comes in close proximity to another piece of equipment.
4. The in-cab display allows the operator to visually identify their machines' location in the work area.

The ability to setup a Geo-fence (2) or view the in-cab display (4), would have greatly lowered the risk of Mr Houston going over the edge of the excavation^{82 83 84}.

⁸⁰ Appendix - R2 Fatality 190101 IncidentPlan SRM REV 190517.pdf

81 Appendix - [SRM GDL Training Scheme.pdf](#)

82 Appendix - [SRM CDE Training Scheme.pdf](#) – Line 256

83 Appendix - Line 283

84 Appendix - Line 192

20. Conclusion

Mr Houston was a very experienced dozer operator and considered by his peers to be a skilful operator. He had worked at several different mine sites across the Bowen Basin conducting various types of dozer operations.

On the nightshift 31 December 2018, Mr Houston was deployed to Ramp 2 North with two other operators to conduct dozer push operations. Their task was to continue preparation of a work area. Dragline 13 was then to enter the area and remove the overburden material and expose the coal seam.

At the start of the shift Mr Houston travelled to the work area with the two other operators. Mr Houston was described by his colleagues as being in a good frame of mind⁸⁵ and looking forward to spending time with his daughter on his days off⁸⁶.

On arriving at Ramp 2 North the three operators discussed their activities for the shift. This included where each operator would work and that they would break for their first lunch break between 10:30pm and 11:00pm.

At approximately 10:25pm, Mr Houston proceeded to leave the work area for the first lunch break. He travelled adjacent to the excavation edge and has passed in front of the dozer operated by Mr [REDACTED]. At this time Mr [REDACTED]'s dozer was pushing slots at 70 degrees to the edge of the excavation. On passing Mr [REDACTED] dozer, Mr Houston has made a change of direction to his left, and then continued driving his dozer.

Mr Houston is an experienced dozer operator and has been conducting bulk dozer push for many years. It is customary practice and indeed a requirement of the safe work instruction to push the material at 90 degree to the excavation edge. This ensures that the dozer always presents the blade to the edge.

As Mr Houston has driven past Mr [REDACTED]'s dozer he has observed the position of Mr [REDACTED]'s dozer pushing towards him. When passing Mr [REDACTED]'s dozer Mr Houston has changed his direction to be parallel to Mr [REDACTED]'s dozer blade. As a result of this Mr Houston's path of travel has aligned to 90 degrees with the slot being pushed by Mr [REDACTED].

Mr Houston's decision to change direction at this time is consistent with bulk dozer push operation, which requires operators to push material at 90 degrees to the excavation edge. Due to his experience, it is conceivable that his memory recall of dozer position has triggered him to change his direction to what he interpreted to be the correct angle. Mr Houston has travelled approximately 15 metres after changing direction until he has driven over the edge of the excavation.

Due to the nature of the task, being to raise the bench up to the required level, the operators inadvertently filled the void against the safety berm. This reduced the effectiveness of the

⁸⁵ Appendix -
⁸⁶ Appendix -

[pdf](#) – Line 422
[df](#) – Line 437

safety berm allowing Mr Houston to travel up and along the safety berm^{87 88} and over the excavation edge. The size of the safety berm was not constructed or maintained at a size that would have alerted Mr Houston to its presence, or the proximity to the edge.

Mr Houston's dozer has rolled down into the excavation coming to rest on its roof in a body of water and mud. The integrity of the cab itself remained intact due to the ROPS, however all window glass of the operator cab was destroyed. The autopsy report revealed that Mr Houston had survived the initial incident but the cause of death was due to the aspiration of mud.

21. Actions taken by DNRME after the accident

1. A Directive was issued by Inspector Graham Callinan

- ❖ *All bulk push dozer operations associated with dragline bench preparation are suspended at the Saraji Mine. These activities are suspended until the Safety and Health Management System is reviewed to ensure it provides for an acceptable level of risk for bulk push dozer operations associated with dragline bench preparation.*

2. A Substandard Condition or Practice was issued by Inspector Graham Callinan

- ❖ *The Site Senior Executive must review the Safety and Health Management System to ensure it provides for an acceptable level of risk for the conducting of dozer push operations. In particular for working in close proximity to crests and slopes.*

3. Safety Alert 362 was issued to Industry⁸⁹.

22. Recommendations

Mines should utilise the safety technology currently available that can be fitted to machinery that will provide operators with an audible and visual alert to hazards.

Mines should ensure that if a machine is introduced to site and has the capability to transmit function/operational data, the system should be enabled.

Mines should ensure that all hire / contractor equipment is compliant with the site vehicle and mobile equipment compliance standard.

Mines should ensure there is emergency vehicle access into pits where machinery is working on benches above.

⁸⁷ Appendix - [Bunding of edge.JPG](#)

⁸⁸ Appendix - [Bunding of edge 2.JPG](#)

⁸⁹ Appendix - [Safety Alert 362.pdf](#)

Mines should ensure that there is adequate protection to prevent equipment from entering bodies of fluid and where practicable remove the fluid before work commences.

Mines should ensure that supervisors have a clear understanding of safety and health management system requirements for tasks being undertaken at each work area they are responsible for.

23. Appendixes

1	110347919 - Form 8 autopsy report - HOUSTON Allan.pdf
2	Blast Image Prior to Incident _06122018_02_46D24_DOB_03.mpg
3	Blast Image Prior to Incident _05112018_02_46D24_DOB_02.mpg
4	BMA Form - Daily Shotfirer Report (15102018 - 04112018).pdf
5	C03881-001_BMA Saraji D11T Equalizer Bar_Report.pdf
6	DNRME Drone Footage 03012019.MOV
7	DZ804 BMA Compliance 16102017.pdf
8	Emergency Response Photo 1 31012018.JPG
9	Emergency Response Photo 2 31012018.JPG
10	Emergency Response Photo 3 31012018.JPG
11	Emergency Response Radio Ch4 31122018.WAV
12	Training Transcript.pdf
13	Training Transcript.pdf
14	HAZ NOV DEC 2018.pdf
15	HDAL Report_BMA Saraji_DZ804 D11T GEB00208_04Feb2019.pdf
16	Houston, Allan John SC063482 Training Transcript.pdf
17	Life Extinct Form Houston 01012019.pdf
18	1Medication Declaration Houston Allan 11 07 2016.pdf
19	ML 1775 Resource authority departmental report.pdf
20	1Pit Water Photo 3.JPG
21	QGM0001- SARAJI LIGHTING REPORT - FINAL.pdf
22	R2_Fatality_190101_IncidentPlan_SRM REV 190517.pdf
23	Re-enactment of Incident Scene 1.MOV
24	Re-enactment of Incident Scene 2.MOV
25	RESPONSE - Notice of Document Production Requirement Training.pdf
26	ROI
27	ROI
28	ROI
29	ROI
30	ROI
31	ROI
32	Safety Alert 362.pdf
33	Saraji D11T Dozer Mechanical Inspection.pdf
34	Saraji Water in Pit Prior to Blast.JPG
35	SRM FAM Bulk Dozer Push Operations Presentation.ppt
36	SRM GDL Training Scheme.pdf
37	SRM PRO Risk Management Procedure.pdf
38	SRM SOP 020 Design and Construct Safety Berms.pdf
39	SRM SOP 100 Workplace Inspections.PDF
40	SRM STD Working In and Around Water Standard.PDF
41	SRM SWI Bulk Push Dozer Operations.pdf
42	SRM SWI Pushing Over a Highwall or Highwall Bench.pdf
43	Supervisor Report 2.pdf
44	Supervisor report 3.pdf
45	Supervisor report 4.pdf
46	Supervisor Report.pdf
47	TOX - HOUSTON.pdf