Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Cannington Pty Ltd	Investigation	Northern	03/02/2015

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

Today I attended site to inspect a development face where a worker had sustained injury due to fall of a rock from the face.

At approximately 4.30 am on 31/01/2015, a loader operator while cleaning the bottom of the face with pelican picks along with two face prep crew members at 520mlv Ue91DS, a slab of rock slid off the face and contacted the operator. The operator sustained neck, shoulder and back stiffness.

Upon arrival at the site I was met with Ms. Grant Egginton, Mine Manager who briefly explained me the incident and gave me a copy of the incident notification, copy of the survey memo that showed the location and the face position at the time of the incident.

I was advised that the first cut was taken from 90XC drive. The incident had occurred at the time of preparation of the 2nd cut. Following the incident the 2nd cut had been fired.

Accompanied by Mr Egginton and Mr Ashley Griffin, Development Superintendent I went underground and reached the face.

The first cut of Ue91Ds face from 90XC drive was taken at an acute angle which was like a corner strip. The rock mass on the face appeared to be very poor with several joints and multi-directional faults. The ground support provided was 50mm fibrecrete, mesh and combination of resin and friction bolts. The face was found to be supported with mesh and bolts.

Mr Egginton said the face has been declared as very poor ground and the site has decided to support the face with bolts and mesh during the ground support cycle and prior to face preparation activity.

We went to another development face at 295 mLv 43 XC face. The right hand side of the face had a big lump. I was advised that mechanical scaling has been completed that left the face scaled back 1m inside. The back is required to be supported before undertaking any further

activity on the face. I had a brief discussion with Mr Tony Baird, Jumbo Operator and Mr Coden Turner, Supervisor on development activity including face scaling and face preparation.

We then returned to the surface. On my request I was provided with the following documents:

- A copy of the significant incident notification that outlined the incident and the immediate control measures. This has been rolled out to the mining personnel and the crews.

- A copy of the development memo for Ue91Ds and the mine planning and geotechnical checklist. - I observed that the site was marked inspected. However, in this case the face was shotcreted and ideally should have been inspected after the first cut. I was later on advised that the face could not be inspected prior to the incident as the first cut was taken at the end of the shift and the incident occurred late at the night. The site does not have geotech coverage on night shift. In such case my recommendation would be to ensure geotech inspection after the first cut (if the face was shotcreted before) prior to any activity on the face.This was principally agreed to.

- A copy of the geotechnical inspection and face mapping carried out after the incident.

- A copy of a grade sheet which includes the ground condition of the face - If a ground condition is identified as very poor, as per the new standard the face would be supported.

- Copy of the development activity sheet for Ue91Ds.

- A copy of the face preparation manual.

Before leaving the site I had a close out meeting with Mr Egginton where we discussed about the requirement of conducting a risk assessment on face support as the activity would be carried out prior to face preparation. The face preparation activity enables the site to identify any potential misfire or any remnant explosive inside a butt. Mr Egginton said the site would conduct a risk assessment if not already done so. I also requested to provide me the details of training of the injured person on face preparation.

Subsequently on 14th and 18th February 2015, I was provided with the risk assessment report and the training details of the injured person.

I noted that the training of the operator on face preparation and ground awareness was current on the day of the incident.

The site should consider to review the issues that were discussed during the investigation of the incident.

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	22/10/2014

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Site Safety & Health Reps Consulted: Mr David Fittock

Today I attended site and carried out an underground inspection to look into the development activities and the site's process for installation of bunding at the draw points. On my arrival at the site I was met with Mr Grant Aitchison, Mine Manager to whom I explained my purpose of visit. I was thereafter assisted by Mr Arthur Pons, Development Superintendent and Joe Russell, Production Superintendent.

A discussion was held with Mr Louis Louwrens, Mine Planning Engineer, on the mine's development planning and design process and I sighted a few mine planning and geotechnical checklist (FRM -cd4324). It was good to note that the development designs are checked by a person other than who created the design.For geotechnical aspects also the checklist is required to be reviewed by someone other than the Geotechnical Engineer. The plan and the design then go through an approval and sign off process.

I discussed with Mr Louwrens about the checks for identifying vertical openings within close proximity of a proposed development. This I discussed because recently an incident of development breakthrough had occurred in an unfilled stope in a mine. I noted that at this mine both the designer and reviewer are required to tick a box 'yes or no' against a check-question "are there any vertical openings within 10m?" and they tick the appropriate box after checking the design in the 3D modelling software. The next check-question is " Are these vertical openings shown on the plan" and it is ticked 'no' as it cannot be shown on a plan. It is recommended that the site should consider providing a small section on the same sheet to show such vertical opening or solid and this may add to the value. Alternatively the site may consider to add in the checklist "all surrounding mined out shapes have been checked" from the 'check slice' file (Refer dot point 9 of 4.2.1 of PRO-TS0137)

I sighted the site procedure PRO-TS0137 for U/G Mine design. Point 4.2.8 stipulates 'no development to proceed unless there is a 20m vertical clearance above unfilled open stope areas/open hole'. It is suggested that "20m" should be incorporated in the checklist (FRM-cd4324) instead of "10m".

Accompanied by Mr Pons I went to the following areas underground:

- 120 mLv KEDN. Mr Ray Fittock was boring the face. Ventilation was good.
- 220 mLv D6 cross-cut east. A paste development face was being charged with emulsion.

The ground was supported with short-term paste development (Can-03) ground support standard which was 50mm fibrecrete and 11 split sets. Mr David Fittock, a mine employee and Mr Marty Wells from Orica were charging the face. Mr Fittock was also one of the safety and health representatives for the mine. I had a discussion with Mr Fittock and Mr Fittock had no safety issues.

- 500 mLv SA69 Drive North. No work at the time of inspection but the face was prepped. I sighted the development activity sheet (FRM-cd4441) kept in the drive.This is a very good practice that the mine is following. The activity that the last person had done on the face is recorded which also indicated if the next cycle could be undertaken. It was good to note that every development face has an activity sheet to be filled out by the crew.
- 575 mLv 57N.54Hl stope. The brow was open. A steel bund was in place. I noted that the steel bund did not cover the full width of the drive. More than 1m on each side was open. I was advised that person can approach up to the back of the steel bund.The bund as I was advised was placed 5m from the brow
- 320 mLv 32N.G5HG stope. Mr Mathew Watson was bogging from the draw point which was closed. Ventilation was good and dust was effectively kept suppressed. The 5m mark was not visible. I was advised it was concealed in the muck rill. The paint mark needs to be ensured from time to time. I observed the operator had a good understanding about the draw point opening and the bunding requirement.
- 140 mLv 14JE7.FZ stope. Open stope draw point. A dirt bund was in place. The bund was about 2m high and was placed about 5m distance from the brow.

On the surface I sighted Cannington procedures for 'Mucking from draw points (SWI-UG0130C)' and 'Construct and place bund walls and stop blocks (SWI-MIN0016C)'. It was noted that a 'sliding scale' has been stipulated for construction and placement of the bunds. It is emphasised that the construction and placement of bunds must take place according to the scale and the site needs to ensure that. In case of the steel bund, although it is to be placed 8m away from the open brow, the site needs to find out a process how full width of the drive could be covered.

I had a discussion with Mr Joe Russell, production Superintendent about the integrity and process of checking of bunds. Mr Russell informed me that the site has developed a process for checking the critical controls that are in place to mitigate the risk with very high consequences like single or multiple fatality. One of the critical controls identified was installation of protective bunding. Superintendents from various departments are scheduled to carry out inspection/ observation at certain interval to assess the status of implementation of the critical controls. Mr Russell said the inspections as per the 'Critical control performance system' has not yet been started but are about to start.

I had a brief discussion with Ms Christina Rurak, Geotechnical Engineer on the process of ground support selection for the development through the paste fill. Ms Rurak said the support for the paste fill development had been designed based on a numerical modelling analysis. However, the document was not readily available and as such **I may be provided with a summary of the process of ground support selection for development through the paste fill.**

Prior to leaving the site I had a close out meeting with Mr Aitchison and Mr Vincenzo De Carolis, Site Senior Executive.

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	19/12/2013

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Today I attended site and carried out an inspection of the site's ground control management system. Yesterday during underground inspection I looked into the condition of ground and the quality of ground support.

I had a detailed discussion Mr Hendrik Esterhuizen, Geoscience Superintendent and Ms Su Wong, Senior Geotechnical Engineer on the site's 'ground control management plan'(GCMP), resources, geotechnical inputs in the development and rehabilitation plans, geotechnical inspections and feedback systems from workers, auditing and monitoring of rock mass, ground control practices and the ground support, recording system and training.

The operation utilises a comprehensive Ground Control Management Plan (GCMP). The GCMP is an auditable document that forms part of the SHMS. I sighted CAN-MINING_ PROCEDURE-Ground control management plan PRO-cd4119 date 30/11/2012, which is the overview of site's ground control system and consist of following core documents:

- Geotechnical Management
- Geotechnical ground support
- Geotechnical code of practice
- Geotechnical fibrecrete manual
- Geotechnical instrumentation and monitoring
- Geotechnical stope assessment
- Geotechnical seismic system
- Ground awareness
- Manual scaling training package.

Mr Esterhuizen said the GCMP is under review in line with the requirement of reviewing this every year.The document 'Geotechnical management' details the human resources allocated for ground control. Each roster is covered by a senior Geotechnical Engineer, 2 Geotechnical Engineers and 1 Junior Geotechnical Engineer apart from a Principal Geotechnical Engineer or a Graduate.

I sighted few mine development plans that has a geotechnical checklist and sign off

requirement by geotechnical Engineer and reviewer. I reviewed how the potential hazards like voids, diamond drill holes are being addressed in the checklist and in the plan and survey memo. The survey memo specifies the ground support standard. As a check, a daily development summary sheet is available that shows the support requirement and the specifications.

Mr Esterhuizen said the site carry out annual hazard mapping for each level and identify the areas that have been deteriorated over time and requires rehabilitation or immediate barricading. Ms Wong showed me examples of various mapping that considers elements like ground water, damage, ground support and corrosion. Based on the survey the site prepares the rehabilitation plan and the requirement is recorded in the rehab register. Currently the decision for (yes or no) and the type of rehabilitation requirement is based on engineering judgement of the person assessing the data from survey. *It was recommended to develop a process to determine a risk rating based on the triggers/scale of the elements considered and accordingly decide on the rehabilitation requirement.*

The mine has a good system of getting feedback from the workers. There is a feedback form and I sighted a copy. Geotechnical Engineers attend pass meeting everyday and directly communicate with the crew during inspection. The engineers also carry out job observations during support installation and a record is kept.

Mr Esterhuizen said almost all the headings are checked by the geotechnical engineers but may not be everyday. An inspection report is made after each inspection and if there is an issue either a memo or an email is sent to concerned shift boss. If it is a major issue, it is recorded in the rehab register and action is taken accordingly.

QA/QC was checked and appeared to be in order. I sighted on few occasions fibrecrete in-situ strength failed but sampling was the issue, it was believed. The matter is under investigation and operators are being re-trained for preparation of the sample.

The site has a rock fall register. The recommendations from the rockfall investigation and the completed actions are recorded in SAP1.

I discussed about my underground observations in relation to ground control with Mr Esterhuizen particularly some deterioration of side wall below the grade line and damage to the rock bolt plates mainly due to machine movement. One such place was 475 mLv EAC, corner of a pillar. This was marked with red and white tape.Mr Esterhuizen said the areas that requires rehabilitation were being identified and action being initiated.

I discussed about the stope wall failure in 32l.F9HG stope that (muck rill) knocked off the paste walls on 01/12/2013. There was potential for inflicting injury to persons had persons been there at the time of the fall.The stope over break was identified since 22/09/2013 and was being monitored. I sighted the geotechnical report of the failure. The walls were previously assessed as potentially unstable and a mapped and modelled fault was also identified running through the walls. However, the potential risk to persons those would be engaged at or near the drawpoints from sudden fall of material from any likely failure was not envisaged. The geotechnical monitoring must identify the potential risk to persons and should take preventive actions.

It was noted that the investigation report that was forwarded to the Inspectorate did not include the relevant geotechnical investigation findings relevant to the incident and I emphasised to include such part in the report.

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	18/12/2013

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Site Safety & Health Reps Consulted: Mr Jason Mitchell.

Today I attended site and carried out an underground inspection to look into the production activities. On my arrival at site I was met with Mr Grant Aitchison, Mine Manager to whom I explained my purpose of visit. I was thereafter assisted by Mr Joe Russell, Mines Superintendent.

A discussion was held with Mr Frikkie Sadie, Planning and Scheduling Superintendent, on the mine's long and short term planning. From the long term (5 year) plan, the mine does a 2 year plan and break up to a monthly schedule using EPS (enhanced production scheduler) that provides all the stages of production activities.The monthly schedule is then broken up in 4 weekly schedules. Weekly schedule consists of shiftwise plan for all mining activities.

A discussion was held on how the site identify and manages risk at different stages of stoping process. Mr Sadie said a stope summary is generated that shows what stopes are going to come up in the scheduling more or less 9 months prior to starting of a stope planning process. The stope planning and design process follows Cannington stope design procedure (PRO -TS0135) and I sighted a copy.The design procedure includes design standards, development of stope note and risk assessment requirement to consider geological, geotechnical, drill and blast, ventilation and production factors. From the risk assessment a control action plan is generated that assigns the responsibility for implementation of the identified controls with a time line. All the outstanding actions from the risk assessment action sheet are captured in a pre-production checklist which is completed and signed off by the responsible persons prior to commencement of firing the stope.

I reviewed the stope risk assessment documents and the pre-production checklists for 24.A0FL and 45c.04HL stopes and noted that all the actions were completed and signed off. The checklists move to 'fired/bogging' status when firing is complete and then move to 'filling' when it is emptied.

It was noted that the actions taken by the responsible person were not being documented/ recorded in the system. This would be beneficial to retrieve information on a later date, if required particularly for an action that has a global or subsequent effect. This may further assist to close the loop of the risk assessment process for the stope.

Accompanied by Mr Russell we went to the following areas underground-

- 320 mLv, 32l.F9HG stope draw points crosscuts where the fibrecrete fill walls were knocked off by the rill from a wall failure after the stope was emptied and was being prepared for filling. Paste wall was re-erected in two of the draw points and in one draw point muck rill was shotcreted following which the stope had been filled up to certain level. The investigation identified that bunds at draw points were insufficient to contain rill and the fill walls were located too close to the bunds. The site has recommended to take action on increasing the bund height and update open hole procedure.

  It was noted that the site has only focussed on the inadequacy of the control that was in place at the time of incident. The site needs to identify all the hazards in relation to all the activities where personnel may be exposed to an unacceptable risk working close to an open stope brow. The site then should review the procedures for each identified activity to reduce risk to an acceptable level. The site also needs to develop and implement training to increase awareness for working close to a brow. A SCP (Sub-standard condition or practice) is being issued to carry out a risk assessment for working close to stope brow and update all the relevant procedures.

- 450 mLv, 45 C04 stope where Mr Ross Torrance was bogging conventionally from a stope draw point. The brow was just cracked. There was 5m line and 15m line. I sighted the operator's personal risk assessment and pre-start check book and discussed about the implications of the lines. No operator should go past the marked 5m line from the brow. Again, the site procedure is to cease bogging when the brow is cracked and should go remote. It is recommended that the site should clarify the requirements to the operators that if the brow is cracked, 5m line is insignificant. They need to withdraw.

  I sighted the proximity detection screen in the loader cab. It was showing the presence of light vehicles and persons(cap lamp) within 20m. I also sighted the screen on a truck. Mr Russell said still the site is working on the system for accommodating several variations.

- 450 mLv, 60l.56HL, Mr Jason Mitchell, operator was drilling production holes with an Atlas Copco Simba L6C drill rig.I sighted the pre-start check book and drill plans.Mr Mitchell said he has access to all the procedures and SWIs in relation to drilling and I sighted some of the procedures (laminated) were available in the cabin. As regards to drilling of down holes, I was advised that the site has a procedure/risk assessment for preparing drill sites that considers bone out (clean-up floor). Mr Mitchell was also the site safety and health representative. While discussing on safety issues Mr Mitchell said the site needs to improve ventilation in some areas where effective dilution of DPM (diesel particulate matter) could be an issue.

- 475 mLv EAC breakthrough site for the drilling and I noted that the access was barricaded and signposted.

- 500 mLv R4 ore pass where Mr Chris Horton and Mr Tony Robson were charging the ore pass. I sighted the charging plan and I recommend to include a section in the plan showing the length of the holes and the required charging length. I checked the charge car and the explosive and detonator storage facility.

- 350 mLv, 42b.64FL stope. The stope was being backfilled from a tipple. The tipple had a pre-start checklist that was completed and signed by operator and supervisor.It is recommended the supervisor should write their name. The controls were well maintained.

On the following day after I completed an inspection on ground control, I had a close out meeting with Mr Troy Wilson, SSE where I discussed my observations and conveyed the issue raised by the site safety and health representative. Mr Wilson said the site has a DPM management plan that is considering generation of DPM to a least possible level, but would however ensure the ventilation is adequate for diluting DPM to a safe level, if any and would consider for a crew presentation on the issue.

As a result of inspection I issue the following.

Number	Substandard Condition or Practice	Due Date
1	**Risk Assessment**	**28/02/2014**

The site is to carry out a risk assessment to Identify all the hazards in relation to all the activities where personnel may be exposed to an unacceptable risk working close to an open stope brow. The site then should review the procedures for each identified activity to reduce risk to an acceptable level. The site also needs to develop and implement training to increase awareness for working close to a brow.

Refer Section 6-9 of the MQSHR 2001

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

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Northern Region

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Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Asok Sur, Inspector of Mines (Metalliferous)

Subject:	**Risk Assessment**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	18/12/2013
Record Date:	08/01/2014	**MRE Item No.:**	1

Title: Risk Assessment

Description of Action Required to be Taken:
The site is to carry out a risk assessment to Identify all the hazards in relation to all the activities where personnel may be exposed to an unacceptable risk working close to an open stope brow. The site then should review the procedures for each identified activity to reduce risk to an acceptable level. The site also needs to develop and implement training to increase awareness for working close to a brow.

Refer Section 6-9 of the MQSHR 2001

References:
MQSHR 6-9 of the MQSHR 2001.

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 28/02/2014

Completed: 27/02/2014**, Closed by:** Asok Sur **on** 28/02/2014 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Risk assessment conducted and procedures reviewed and updated. Crews inducted with the updated procedures. See attached response.

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
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Today I attended site and undertook an inspection underground in relation to an incident of temporary crown pillar fall off exposing personnel to a significant risk.

A discussion was held with Mr Ed Cooney, Mine Manager, Mr Quentin Toose, Senior production Engineer, Mr Dennis Odgers, Production Superintendent and Mr Tim Le-Lievre, Paste Fill Engineer.

The incident was explained to me on the relevant plans and sections and also through surpac. I was advised that an investigation to the incident had been completed which was awaiting final sign off and I was provided with a copy of the preliminary investigation findings and the recommendations. The incident was briefly as follows:

- On 21/10/2012 in the day shift, a production driller went to 425mLv of 57k56 stope to complete production drilling (down holes) for the top lift of the stope. The driller identified cracks in the floor and back.The rig was removed and the stope access was barricaded off.
- In the previous shift, at the 450mLv (next below level), mass firing was conducted to take the lift below (no up holes), leaving a designed 10-13m temporary crown above the 450mLv drive and below the 425mLv where the drill was going to work.
- A Cavity Monitoring Survey (CMS) was completed on 22/10/12 that showed approximately 7m fall off from the temporary crown that left a minimum 3m pillar below the floor of the 425mLv, which the production driller and later on the Geotechnical Engineers had been exposed to when they entered the site. The fall off also included overbreak of the pastefill mass from 57j56HL stope to which 57k56 stope was exposed to.

It was evident from the discussion and the findings of the investigation, the stope fall off had occurred due to combination of the following contributory factors-

- Unfavourable geological condition - a structure was running through the crown that fell off.
- Relatively smaller sublevel interval (10m)
- Paste overbreak apparently due to poor quality of paste.

An inspection of the temporary crown from the 450mLv after the firing and prior to any person entering the 425mLv was not carried out apparently due to presence of gas from firing.

However it was identified that temporary crowns were typically not inspected. In the instant case had the crown been inspected from 450mLv, the fall off would have been identified.

The corrective actions to prevent such type of incident in future were discussed in details. The site investigation recommendations were as follows:

1. Identify and develop geotechnical criteria to identify risk of temporary crown, including W:H ratio; paste quality; rock mass properties like RQD; number of paste exposures. These criteria must be noted in the preliminary geotechnical report for the stope.
2. Drill and blast designs to incorporate temporary crown risk by changing firing sequence or design to mitigate risk where possible.
3. Geotech final stope assessment to incorporate inspection and barricading (NEUA) requirements for high risk temp crowns – (this will follow in the geotech stope assessment). Further Risk Assessment to be completed on temporary crowns when required.
4. Communicate present findings of investigation to all engineers and reiterate importance of checking hole depths prior to entry and use the design process to remove temporary crown hazards where possible.
5. Communicate present findings of investigation to all production crews and reiterate importance of checking hole depths prior to entry i.e. walk-in prepping.

Mr Cooney said the site has already implemented all the recommendations of the findings. He cited example of a recent stope that was fired at 200mLv leaving a temporary crown below 180mLv for which a 'high risk' risk assessment was completed prior to firing as per the recommendation of the findings.

I sighted a geotechnical stope design assessment sheet that includes the considerations of the temporary crown parameters for the stope evaluation.

We discussed in detail regarding the QA/QC for the pastefill masses. I sighted the fill notes for the stopes that were exposed to 57k56 stope and safe work instructions for analysis of the solid density and paste quality sampling. The current method of QA/QC testing is by measuring solid density of the paste run every three hours and adjusting the cement content manually to achieve the desired strength. Mr Cooney agreed that at times achieved QA/QC strength falls below the designed strength when compared through the population of data. The system appears to lack robustness and if not done diligently may go awry. It is recommended to review the current QA/QC to adopt a system that would ensure the quality to achieve designed strength.

Mr Cooney said AMC is currently reviewing QA/QC of the pastefill mass and would recommend the actions for its improvement.

Mr Cooney said as a part of recommendation a criteria for assessing the risk in pastefill development has been developed by the geotechnical department and currently in use. I sighted the memorandum that was issued to address this.

Accompanied by Mr Cooney, Mr Odgers and Mr Toose I went underground and inspected the following places:

1. 425mLv 69 XE development face in paste mass. This was a bypass drive being developed through the paste filled stopes. The wall and back were supported by 50mm fibrecrete, mesh and split set bolts and then again 50mm fibrecrete.

2. 425 mLv 56XC of 57k56 HL stope over the temporary crown where the cracks were developed due to crown fall off. The access was kept barricaded with no entry sign. Mr Cooney informed me that recovery rings have been drilled out from 450mLv. A risk assessment had been completed to deal with the crown. A drill rig would be set up at 425mLv to drill some holes dumped forward parking the rig outside the stope shape.

3. 450mLv blast drive below the crown that fell off. The 'fall off' was visible clearly.
4. 200mLv stope 22K DO north below the temporary crown. The crown could be seen intact up to the pastefill mass of contact stope. This firing was done after the incident and after completing a risk assessment as per the new defined criteria.
5. 245mLv 2474 HL stope where bogging was being conducted from the stope draw point. I discussed with the operator on the criteria to cease conventional bogging. I was advised that a paint mark would be in place on wall 5m before the last row of support and LHD cab must not go past that point. The paint mark was not very clearly visible. The brow was however closed. It was advised that prominent paint mark must be ensured before commencing bogging to which Mr Cooney agreed to.

Before leaving the site I had a close out meeting with Mr Cooney and Mr Troy Wilson, Site Senior Executive and discussed my observations.

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Site Safety & Health Reps Consulted: Mr Noel Stone

Today I attended site to look into production and conducted an inspection underground. On my arrival I met Mr Grant Aitchison, Dy Mine Manager to whom I explained my purpose of visit and then had a discussion with Mr Aitchison, Mr Louis Louwrens, Planning Engineer and Mr Arthur Pons, Production Superintendent on stope design and production process. Following points were discussed:

- The mine has a robust stope design process that involves geological interpretation, economic evaluation, scheduling, preliminary design, geotechnical assessment, blast hole design, stope development design and review, final designs and authorisation to proceed and all the information are documented as a stope note. Prior to finalising the stope design a risk assessment is carried out to identify the risk associated with the stope and the relevant controls.The final stope note goes through a sign-off process and then released for ring design and production. The mine has a 'stope design' procedure(PRO-TS0135) that provides a guideline for the stope design. I sighted the stope note related to 37a.78FL stope, risk assessment and the sign-off sheet. Once the stope note is released a pre-production meeting is convened that addresses issues identified with risk assessment, operational issues and any changes.I sighted the pre-production and completion checklist of the stope that includes the issues, controls and persons responsible to implement them. Finally once the stope is completed and filled up, stope reconciliation is done that includes a requirement of auditing the actions from the risk assessment to ensure all the risk has been identified and appropriate actions were taken. The site must ensure that this is addressed appropriately. It was also observed that there is a requirement to record all the operational problems connected with drilling, mining and filling of the stope with a view to form a set of key learning for reference to future stopes. It appeared that the stope note hardcopy lacks such information and the site must ensure to capture and record these information and form part of the stope note.
- Proximity detection. Scheduled to be completed for underground in September 2012. Most of the underground equipment have been installed with the system. Light vehicles would have a sensor that would give an alarm whereas other equipment will have LCD monitors.
- Total mine void which was about 800,000 tonnes out of which 600,000 tonnes are available void. However, the voids are scattered and no stoping is done within 40m of

another stope. The stability of the mine is in no way affected due to the current void. The status regarding the void is communicated and explained to the crew from time to time.

Accompanied by Mr Pons and Mr Aitchison I went underground following places:

- 37a.78FL stope. 350m LV. No entry sign, reflective strip and barricaded 5m behind the vertical edge.
- 37a.78FL stope. 375m LV. Mr Mark Debnam was mucking from a stockpile onto truck. Muck was bogged from stope to stockpile by teleremote mucking last night as brow was cracked. It was good to note that at the access drive all the documents in relation to teleremote mucking such as teleremote pre-start, plans and sections with location of laser barriers, teleremote installation plan, SWI etc were placed in a folder. At the stope draw point a 5m line was marked from the stope edge that was the indicator for the operators not to go past the line. I discussed with the operator when to cease conventional mucking (5m line or the cracked brow?)as well as the requirement for checking upper levels prior to bogging from the stope. It appeared that there is some ambiguity/indistinctness regarding the requirement.I emphasised that these issues must be discussed in the tool box meeting and necessary inputs given to the operators about the requirement as per the procedure. This was agreed to by both Mr Aitchison and Mr Pons. I may be provided with a feedback that this has been done.
- 325m LV 42F.61HL rock fill tipple. All ore pass standard maintained. There was a 3m line. As the truck was tipping into the ore pass, the access to the ore pass was open (not barricaded and sign posted). The tipple had a concrete stop log. A 3m line was marked on the wall from the edge. A sign with regard to requirement of a 'fall arrest equipment' was not in place and also there was no anchor point established. here too there was a confusion about the requirement. Later on, this requirement was identified from the procedure/SWI. A SCP is being issued to address this.
- 425m LV ore pass with ore pass ring connected with COP. The ore pass was covered and meeting all the ore pass requirement. Mr Pons stated that a temporary bund is constructed while tipping and cleaned before cover is put on. The ore pass should have a physical demarcation/identification to identify the location when the pass is full (for example reflective strip on back).
- 245m Lv. 326.12HL stope. Mr Noel Stone, production driller was waiting for survey mark up for drilling couple of CALs holes. An IT was rigged up to fix vent bags in the drive. It was noted that the IT had fixed bucket. Mr Stone was also the Safety and Health representative for the mine. Mr Stone had no safety issues.
- 450m Lv crib room. Very well maintained crib room.

Before leaving the site I had a close out meeting with Mr Troy Wilson, SSE and discussed my observations. Mr Wilson agreed to resolve the issues pointed out.

As a result of inspection I issue the following:

Number	Substandard Condition or Practice	Due Date
1	**Signage**	**17/08/2012**

At the time of inspection the rock fill tipple did not have an appropriate sign (eg. use lanyard) for warning persons approaching the tipple as well as no established anchor point.

Ensure to place on each level of an ore pass or tipple an appropriate signage (eg. use lanyard) to inform persons what is required to be done while approaching the ore pass(within 3m) so that risk to the persons is at an acceptable level. Also establish appropriate anchor points for

attaching the fall arrest equipment.

Refer Section 36 MQSHA and section 43, MQSHR 2001.

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Asok Sur
Inspector of Mines
Northern Region

Queensland Government
Natural Resources, Mines and Water

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Asok Sur, Inspector of Mines (Metalliferous)

Subject:	**Signage**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	18/07/2012
Record Date:	24/07/2012	**MRE Item No.:**	1

Title: Signage

Description of Action Required to be Taken:
At the time of inspection the rock fill tipple did not have an appropriate sign (eg. use lanyard) for warning persons approaching the tipple as well as no established anchor point.

Ensure to place on each level of an ore pass or tipple an appropriate signage (eg. use lanyard) to inform persons what is required to be done while approaching the ore pass (within 3m) so that risk to the persons is at an acceptable level. Also establish appropriate anchor points for attaching the fall arrest equipment.

Refer Section 36 MQSHA and section 43, MQSHR 2001.

References:
Refer Section 36 MQSHA and section 43, MQSHR 2001.

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 17/08/2012

Completed: 20/08/2012**, Closed by:** Asok Sur **on** 22/08/2012 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Complied. See attached response.

Department of Natural Resources and Mines
Mount Isa District Office
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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	07/03/2012

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today I attended site and conducted a pre-charging/face preparation audit along with an underground inspection of some development faces.On my arrival, at the mine office I was met with Mr Ed Cooney, Mine Manager and had a discussion with him on the development cycle including face preparation/pre-charging activities, 'line of sight'(LOS) remote mucking and current status of proximity detection system that is on trial at the mine. Following points were noted:

1) Mr Cooney stated that the LOS remote mucking is no longer being carried out at the mine since three years and has no plan to do it in future. A remote harness is there still at the site but that is not meant for any operation. The site currently performs one teleremote mucking from surface chair and three more chairs would be added by the end of this financial year(June 2012). 5 loaders currently have the teleremote capability and are being operated either from back of a light vehicle (LV) or underground cabin.

2) Proximity detection system is still on trial and currently installed with 1 loader, 1 truck, 2 ITs, 2 LVs and on 2 cap lamps. Mr Cooney stated that between now and end of June all heavy and light vehicles underground and cap lamps would be fitted with the proximity hardware and from July 2012 two MINESITE technologists would be on site to monitor the performance of the system. Following year all surface equipment and vehicles would be fitted with the hardware. The sensor fitted with an equipment beeps an alarm when within 50m of another equipment and the intensity increases as it comes nearer. The system does not have a collision avoidance system but can be integrated in future. Mr Shane Fielding, Project Officer is the coordinator for the proximity detection system.

3) Following activities are carried out during the development cycle.

- Re-entry after firing.
- Face bogging
- Fibrecreting the back and walls 50mm
- Meshing and bolting back and walls
- Mechanical scaling with a Jumbo
- Clean up with a loader

- Manual face scaling and face preparation that includes checking, cleaning and marking of misfires and butts.
- Face drilling
- Charging and firing.

Every face has a development activity sheet placed near the face that has a checklist of all above activities except re-entry and is required to be completed and signed off by the person who carried out the activity.

4) All the persons carry out an on the job risk assessment 'Take 5' prior to commencing the task.

Prior to going underground I had detailed discussion on the development activities with Mr Ashley Griffin, Mine Development Foreman and sighted related documents on the subject. Underground we inspected-

- RJ 01 DN development face at 375 mLv. Mr Tony Baird, Jumbo operator was boring the face. There were bit marks on the face indicating Jumbo scaling with bit of rotation. I had a discussion with Mr Baird on how he carried out scaling and boring the face.
- RJ 01 DN development face at 400 mLv - Face bogged out. Unsupported. Signs and barricades were in place. There was almost no butts at the face.
- RJ A1 DN development face at 375 mLv. Face charging was about to start by Mr Mark Youman and Mr Amir Helac. I had a discussion with both of them on how they carry out face preparation and face charging. A scaling bar was available on the job.There was a bit (mechanical scaling) mark noticed on the face within the butt marking that was marked after Jumbo scaling.The butts were not marked by this crew.
- La Ds face in paste. Mr Steffan Johnston, Jumbo operator was conducting ground support for the backs and walls with Mr Luke Belling assisting him. I had a discussion with Mr Johnston on how he carried out the activity.

At all the faces I sighted the development activity sheet and each activity was signed off by the person who carried out the activity and provided information about the status of the face. This is undoubtedly a very good practice at this mine.

On the surface I sighted some procedures, safe work instructions(SWI), training packages, filled out activity sheets and forms in relation to development and had discussion with Mr Griffin. The following points are noted from documentation provided and on site discussions:

1) Re-entry after firing - SWI -UG0139C and FRM cd4582. Step number 13 for the charge crew has different form number (cd4583). It is recommended-

- to start the development activity sheet with this re-entry cycle.

2) Face bogging - Training package: Loader LHD operation (Manual -2065, version 29). Following are recommended-

- Although a clean up of the face with a loader is being done after Jumbo scaling, a reference for this requirement may be included in the manual.
- Also include a reference of this requirement in the development charge up SWI UG0017C if there is more than a small amount of material left on the floor.
- The training package 'charge development blast holes (manual 1908, version 18) stipulates ' organize a loader to clean up the roadway if necessary' (page 54) should include the face also.

3) Mechanical scaling with a jumbo. This is an essential activity during the development cycle for this mine. A separate procedure, SWI or training package is not available for this activity. I have sighted 'Geotechnical ground support manual (MAN -cd4045) and 'install ground support

training package' that did not cover this activity.However, mechanical scaling is little bit covered in training package: development drilling (manual 2024, version 18.0, page) but the steps outlined did not appear to cover face scaling. It referenced to a 'SWI UG 0002C mechanical scaling' but the SWI no longer exists in the system. As mechanical scaling is being carried out prior to the check for remnant explosives (face prep) then it should be preceded by a wash down of the face including the butts with a jet of water keeping it away from the hole without attaching the bit and that the scaling be selective using a larger size of the bit, being aware of remnant blast hole locations requiring to maintain appropriate safe distances from the butts. Neither of these documents adequately describes how the mechanical barring down of development faces is to the safely carried out at the mine. A SCP is being issued to develop a mechanical scaling procedure.

4) Face preparation. This activity includes watering down the face, manual face scaling using an IT, misfires and butts checking and cleaning and marking of them. Following are recommended:

- As the face scaling is an essential activity in this cycle, the key points of scaling as given in 'SWI UG0017C development charge up' (Prepare heading for charging) should be included in the 'SWI UG0178C face preparation and misfire identification'.
- In the face prep SWI there is a reference of 'face prep sheets' and I believe this is now being done in the development activity sheet. This needs to be corrected.
- Although during inspection the charging crew confirmed that no one goes past the jack when someone is working on basket, I recommend to include a definitive statement reflecting this restriction in both face preparation and development charge up SWI and training package as well as in the training package of manual scaling (Manual 1548 point 5.5).

5) Drilling. Following are recommended-

- There are emergency stop switches outside the cabin (on both sides) that can switch off power to the boom including hydraulics (not complete power isolation for the Jumbo). These switches are however not being used by the Jumbo offsider while going past the jacks and only uses the positive communication with the operator. It is recommended the offsider should isolate the booms by activating the switch prior to walking out in front of the jumbo cabin/jacks.
- To mechanically check scale the face post boring so that any loose rock formed during boring is scaled.
- To make a Jumbo come into a heading that has been left for some time to mechanically scale the face.

Before leaving the site I had a close out meeting with Mr Troy Wilson, SSE and Mr Cooney where I discussed my observations. Mr Wilson agreed to resolve the issues pointed out.

As a result of inspection I issue the following:

Number	Substandard Condition or Practice	Due Date
1	**Mechanical scaling of development heading**	**23/04/2012**

The mine does not have a procedure or standard work instruction which describes how a jumbo operator would safely scale a development face which may contain remnant explosives. Having regard to the nature and level of risk from the task the mine is to develop a standard work instruction for how it may be safely carried out, taking into account, but not limited to, the comments in my MRE.

Refer Section 70(1) & Part 11 MQSHR 2001

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Please notify me in writing when the above SCP has been addressed and what was done to address it.

Asok Sur
Inspector of Mines
Northern Region

Department of Natural Resources and Mines
Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Asok Sur, Inspector of Mines (Metalliferous)

Subject:	**Misfires**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	07/03/2012
Record Date:	12/03/2012	**MRE Item No.:**	1

Title: Mechanical scaling of development heading

Description of Action Required to be Taken:
The mine does not have a procedure or standard work instruction which describes how a jumbo operator would safely scale a development face which may contain remnant explosives.
Having regard to the nature and level of risk from the task the mine is to develop a standard work instruction for how it may be safely carried out, taking into account, but not limited to, the comments in my MRE.

Refer Section 70(1) & Part 11 MQSHR 2001

References:
MQSHR

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 23/04/2012

Completed: 19/04/2012**, Closed by:** Asok Sur **on** 24/04/2012 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Complied with. see attached response.

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	South32 Cannington Proprietary Limited	Inspection	Northern	07/10/2015

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Mine Record Entry

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Today I attended site to inspect traffic management underground and on the ROM pad. I was met and accompanied by Mr Shane Johnson (Haulage superintendent) and My Rick MAy (Haulage Supervisor).

After signing in via PITRAM we proceeded underground. During the inspection I observed the radio communications including the procedure at the portal, tag readers, refuel bay, workshop and crib room at 450 mLv, pedestrian lighting system from 450 mLv up to 425 mLv, and the crusher area entry procedure.

I met with loader operator Mr Wade Christie in the 320 mLv northern zone. Mr Christie demonstrated the proximity detection system in the loader and explained the traffic management system including flashing orange light at the entrance and radio procedure.

Mr May and Mr Johnson also completed a critical control observation on the proximity detection which operated as required. I was advised that since the proximity detection has been installed, reported near misses underground between trucks/loaders and other vehicles/personnel have dropped to zero.

At the crusher area I inspected the ERB (MA350) and found no issues. I spoke with Mr Brett Read (Snr Crusher Operator) who advised me how the CAT remote loader system was operated. This included the laser barriers and remote control release panel that is used to transfer remote control to the surface during firing.

On the surface I inspected the ROM pad area. I was able to observe the relevant signage and entry procedure. The ROM Loader operator Mr Chris Bennett detailed the procedures for entering the ROM and the pedestrian rules around HVs. This included radio communications and the vehicles must be parked and turned off.

Mr Steve Hambrecht (Specialist Mining A&I) supplied me with a number of documents including PLN-cd4031 Traffic Managment Plan, PRO-cd4266 Traffic Control Systems, PRO-cd4265 Surface Vehicle Operations, PRO-PRO0006C Entry to ROM Pad Procedure, and two bow-tie assessments for Vehicle/Vehicle-Vehicle/Pedestrian interactions for surface and underground.

After reviewing these documents I have observed the following improvements:

- A number of common root causes for interactions have not been reflected in both bow-ties,

for example, fatigue

- The ROM procedure does specifically detail pedestrian interactions on the ROM

I have also forwarded a link to the safety alert No. 294 Fatality Involving a Front End Loader regarding ROM pad operations.

https://www.dnrm.qld.gov.au/online-tools/alert-bulletin/alerts-bulletins/alerts-bulletins-search/alerts-bulletins/mines-safety/fatality-involving-front-end-loader

Number	Substandard Condition or Practice	Due Date
1	**Traffic Management**	**16/11/2015**

At the time of inspection the traffic management bow-ties and ROM entry procedure did not reflect all the causes and controls in place.

The site senior executive is to ensure that the traffic management bow-ties and ROM entry procedure are updated to include:
- all common causes for underground and surface are reflected in the bow-ties
- the ROM entry procedure reflects specific requirements around pedestrian/vehicle interaction

Refer section 7 and 8 of the Mining and Quarrying Safety and Health Regulations 2001.

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Damian Lee
Inspector of Mines
Northern Region

Cannington - Substandard Condition or Practice (Response).msg

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Damian Lee, Inspector of Mines (Chemical)

Subject:	**Traffic Management**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	South32 Cannington Proprietary Limited
Activity:	Inspection	**Activity Date:**	07/10/2015
Record Date:	12/10/2015	**MRE Item No.:**	1

Title: Traffic Management

Description of Action Required to be Taken:
At the time of inspection the traffic management bow-ties and ROM entry procedure did not reflect all the causes and controls in place.

The site senior executive is to ensure that the traffic management bow-ties and ROM entry procedure are updated to include:
- all common causes for underground and surface are reflected in the bow-ties
- the ROM entry procedure reflects specific requirements around pedestrian/vehicle interaction

Refer section 7 and 8 of the Mining and Quarrying Safety and Health Regulations 2001.

References:
w

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 16/11/2015

Completed: 16/11/2015**, Closed by:** Damian Lee **on** 20/11/2015 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Procedure and bowties updated

Queensland Government

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	13/08/2014

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Mine Record Entry

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Today I attended site to complete an inspection on hazardous substances and dangerous goods. In particular management of actinolite on the ROM pad and storage of chemicals in the surface workshops.

I was first met with Mr Cam McOrmish (Specialist Mining Contracts) and Mr Jon Bridge (Redpath ROM Superintendent). I outlined the purpose for my inspection and discussed the management of actinolite. I was advised that the ROM operations are notified when known sources of actinolite are being mined. Historically this material was then segregated and processed as quickly as possible. However it is now simply processed through the ROM normally with the remaining feed stock.

I was advised that dust suppression is used on the ROM pad and personal monitoring for asbestos is conducted routinely. I received a copy of SWI *UG0068C-Working with or near Potentially Asbestiform Material* and *SWI-PRO0090 Remove Ore Spillage from Winder Loader Bay.*

Mr McOrmish and Mr Bridge accompanied me on an inspection of the ROM operations. During the inspection I observed the segregation of trucked and hoisted material, positive radio communications, loading of the feeders, location of stockpiles away from the reclaim tunnel, traffic management loops, truck tyre fire bunker at the back of the ROM and workers barricading the hoist area for cleaning spillage. Water sprays were also in operation at the trucked material conveyor to the feeders.

The location and suitability of the tyre fire bunker was discussed. I was advised that the maximum time for a truck to tram from the ROM to the bunker was approximately 1 minute if a tyre fire had initiated. At the time I did not have sufficient information to make any informed comment or judgement about the suitability of the bunkers location.

Following the inspection I met with Mr Justin Walsh (Senior Geologist) who confirmed the actinolite procedure.

I discussed monitoring for asbestiform material with Mr Andrew Gaggiano (Occupational Hygienist). I sighted a number of files including the Master Data Sheet for atmospheric monitoring samples including asbestos and the Risk Profile and monitoring Spreadsheet - FY14 for occupational health monitoring. The shift adjusted TWA for asbestiform material was 0.091 f/ml. The maximum measured result was under this at 0.060 f/ml. While there I also

discussed the results with Mr Charles Buchanan (HSEC Superintendent).

I then conducted a physical inspection of the maintenance workshops focussing on the storage of hazardous substances and dangerous goods. Mr Glen Murphy (fixed plant Maintenance Supervisor) accompanied me through the fixed plant workshops followed by Mr Cameron Blue (Mobile Plant Maintenance Supervisor) and Mr Jason Colborne (Mobile Plant Maintenance TA) through the remainder of the surface workshop and fuel farm.

I was advised by Mr Colborne that he was conducting a planned audit of chemical storage in the workshops during August. I requested that a copy of this audit be forwarded to myself after it has been completed.

A number of issues were observed during the workshop inspection. These included:

- poor storage of gas bottles behind the boilermaker's workshop
- hotwash detergent in wheelie bin not properly labelled and appropriate PPE not available
- labelling on diesel and oil pipes in tank farm faded and need replacing
- oil storage shipping container behind tank farm had a 20L bottle labelled as hydrogen peroxide containing gear oil (removed from container)
- safety shower at diesel dispensers was not shielded from the sun and could potentially heat up to unsafe temperatures if it was required.

Number	Substandard Condition or Practice	Due Date
1	**Storage of gas bottles at workshop**	**05/09/2014**

At the time of inspection gas bottles were not stored appropriately behind the boilermakers workshop. Ensure that the bottles are stored in designated storage areas and are appropriately placarded.

Refer section 53 and 56 of the Mining and Quarrying Safety and Health Regulations 2001.

Number	Substandard Condition or Practice	Due Date
2	**Labelling and placarding of bulk storage of chemicals in the workshop and tank farm**	**12/09/2014**

At the time of inspection the hotwash detergent storage bin was not labelled correctly and the pipe labels in the tank farm had faded and were unreadable in many cases. In addition to this a 20 L drum of hydrogen peroxide was being used to store oil.

Ensure that all pipes and bulk chemical storage containers are labelled appropriately in the workshop and tank farm area.

Refer section 53 of the Mining and Quarrying Safety and Health Regulations 2001.

Number	Substandard Condition or Practice	Due Date
3	**Safety shower at the fuel bowser/tank farm**	**12/09/2014**

At the time of inspection the safety shower installed at the fuel bowser/tank farm area had been isolated (but not locked) due to water supply issues. A portable eyewash was placed but was subject to heating from the sun.

Ensure that the eyewash/shower facility selected for the area is protected from excessive heating due to the sun to reduce/eliminate the risk of heat damage to a worker if needed in an emergency.

Refer sections 8 and 39 of the Mining and Quarrying Safety and Health Regulations 2001.

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Damian Lee
Inspector of Mines
Northern Region

Cannington Processing Dept corrective action status from inspection 12 08 2014.msg

Mines Inspectorate Visit Response.msg

DME - Mine Site Visit - 13 08 2014 - Storage of Gas Bottles at Workshop .msg

Queensland Government

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P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Damian Lee, Inspector of Mines (Chemical)

Subject:	**Chemical Storage**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	13/08/2014
Record Date:	26/08/2014	**MRE Item No.:**	1

Title: Storage of gas bottles at workshop

Description of Action Required to be Taken:
At the time of inspection gas bottles were not stored appropriately behind the boilermakers workshop. Ensure that the bottles are stored in designated storage areas and are appropriately placarded.

Refer section 53 and 56 of the Mining and Quarrying Safety and Health Regulations 2001.

References:
MQSHR 53 56

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 05/09/2014

Completed: 08/09/2014**, Closed by:** Damian Lee **on** 08/09/2014 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Gas bottles stored correctly

Queensland Government

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Phone: (07) 4747 2158, Fax: (07) 4743 7165

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Substandard Condition or Practice

Issued By: Damian Lee, Inspector of Mines (Chemical)

Subject:	**Placarding**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	13/08/2014
Record Date:	26/08/2014	**MRE Item No.:**	2

Title: Labelling and placarding of bulk storage of chemicals in the workshop and tank farm

Description of Action Required to be Taken:
At the time of inspection the hotwash detergent storage bin was not labelled correctly and the pipe labels in the tank farm had faded and were unreadable in many cases. In addition to this a 20 L drum of hydrogen peroxide was being used to store oil.

Ensure that all pipes and bulk chemical storage containers are labelled appropriately in the workshop and tank farm area.

Refer section 53 of the Mining and Quarrying Safety and Health Regulations 2001.

References:
MQSHR 53

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 12/09/2014

Completed: 10/09/2014**, Closed by:** Damian Lee **on** 08/10/2014 12:00:00 AM.

Reassigned Due Date: 23/09/2014; **Review conducted by** Damian Lee **on** 11/09/2014.

Action Taken by Mine to Comply with Corrective Action Requirement:

Completed relabelling

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Damian Lee, Inspector of Mines (Chemical)

Subject:	**Safety Shower**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	13/08/2014
Record Date:	26/08/2014	**MRE Item No.:**	3

Title: Safety shower at the fuel bowser/tank farm

Description of Action Required to be Taken:
At the time of inspection the safety shower installed at the fuel bowser/tank farm area had been isolated (but not locked) due to water supply issues. A portable eyewash was placed but was subject to heating from the sun.

Ensure that the eyewash/shower facility selected for the area is protected from excessive heating due to the sun to reduce/eliminate the risk of heat damage to a worker if needed in an emergency.

Refer sections 8 and 39 of the Mining and Quarrying Safety and Health Regulations 2001.

References:
MQSHR 8 and 39

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 12/09/2014

Completed: 09/09/2014**, Closed by:** Damian Lee **on** 08/10/2014 12:00:00 AM.

Reassigned Due Date: 23/09/2014; **Review conducted by** Damian Lee **on** 11/09/2014.

Action Taken by Mine to Comply with Corrective Action Requirement:

Shade erected

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	12/08/2014

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

Site Safety & Health Reps Consulted: Matthew King

Today I attended site to inspect plant operations. This included the dredging operations in the reclaim dam and the concentrator in general.

I was met and accompanied by Mr Peter Hagen (Operations Superintendent). I inspected the dredging operations at the reclaim dam. Due to the low water level, no dredging was taking place at the time. I inspected the two lighting towers and booster pump at the dam (LP37, LP06 and MT13). The only issue identified was the naming of lighting plant LP06. It was also labelled LP1307 on the outside and in the pre-start book as well.

I met with Mr Shane Fielding (Projects Superintendent) and received copies of *Maxitool Risk Assessment for Dredge operations 31/7/13, Maxitool Safe Work Instructions Dredge Operations 15/8/13* and Cannington *risk Assessment for dredging operations.* I noted that the Maxitool risk assessment was a lot more detailed than the Cannington risk assessment and appeared to address more of the high risk activities.

It was noted that the Maxitool procedures had not been adopted in the same manner as the Redpath procedures into the Safety and Health Management System. I did not check the Cannington requirements for this at the time of inspection but it is recommended that this is checked against the SHMS contractor SWI and procedure requirements.

Following this I met with Mr Matthew King (Plant operator and Site Safety and Health Representative - SSHR). We discussed the role of the SSHR and any issues raised recently. I was advised that the issue of the quality of the work uniforms had been raised. Apparently the new uniforms did not keep workers as clean with lead dust migrating through the uniforms and onto the skin. Mr King advised me that to the best of his knowledge this was at least being rectified in the processing area. He could not vouch for any changes to the underground operations.

Mr King demonstrated how to retrieve procedures and SWIs through iPick. I then observed him completing a routine task cleaning the window on the MSA. I checked the task against the corresponding SWI - *PP0330C - MSA Window Cleaning.* I noted two issues with the procedure.

The first and simplest issue was that the procedure required the operator to open the door to stop the MSA head lowering into the end well. This required the operator to time it so this

occurred. Mr King was able to demonstrate how to achieve this by using the control panel and instructing the machine to park in the desired position without relying on any interlock.

The second issue was how the machine is locked out for the task. The only available of locking the head in place was to open the door. This then triggered an interlock switch attached to the door. However the door could still be closed or the switch reactivated even with a lock through the door handle to prevent it from shutting again. This was an ineffective procedure was isolating the energy source. The procedure will need to be reviewed to address the two issues listed above.

I then inspected the ROM conveyor tunnel and escape tunnel, conveyor system and SAG mill area. A number of smaller issues were observed including an access platform stored in front of an emergency shower (removed immediately), build up at the head of CV04 conveyor creating a falling object hazard for the area below on the feed chute floor, and a build up of pebbles around the pebble crusher.

There was one significant issue with the tunnel. The escape tunnel was barricaded off with a "No Entry" sign. On further enquiry I was advised that it had been this was for some time. At the time the tunnel had been assessed by Hatch and a preliminary assessment made as to how it could be rectified. I was also advised at the time that the author of the report was due to start the following week and that the escape tunnel was on the high priority list.

I sighted a risk assessment dated 27/1/11 after my inspection on 17/1/2011 where I had raised the issue of the escape tunnel. The risk assessment appears to be a justification to continue operations despite the compromised escape tunnel. The additional controls identified in the risk assessment were all administrative in nature.

I raised this issue with Mr Vince De Carolis (SSE) prior to leaving site on 13/8/14 and recommended that he inspect the tunnel himself.

I then spoke with structural engineer Mr John Loader and Engineering Manager Mrs Cheryll Godwin-Abel about what work has been done subsequently. I was advised by Mr Loader that to his knowledge no further work had been completed or planned to rectify the issue.

Subsequent to the inspection I have a number of conversations with Mr De Carolis about the escape tunnel. Mr De Carolis placed an interim no entry condition on the reclaim tunnel until the information and risks could be properly assessed and planned for.

Number	Substandard Condition or Practice	Due Date
1	**Procedure for cleaning MSA window**	**05/09/2014**

At the time of inspection the procedure for cleaning the MSA window did not reflect adequate isolation of the courier head. This included relying on opening the access door at the right time to trip out the head instead of using the control panel to position the head. The isolation technique of using the door switch could also be circumvented very easily and did not positively isolate the head.

The mine is to review and update the procedure SWI - PP0330C - MSA Window Cleaning to address the issue of positioning the head for cleaning and effectively isolating the head. This may require modifications to the head isolation switch.

Refer section 103 of the Mining and Quarrying Safety and Health Regulations 2001.

Number	Substandard Condition or Practice	Due Date
2	**Material build up at the head of CV04**	**05/09/2014**

At the time of inspection a significant amount of material had accumulated under the conveyor at the head of CV04 conveyor. This material created a falling object hazard to the SAG mill maintenance floor below.

The area is to be barricaded until such time the area is cleared of the build-up. Other controls also need to be considered to wither prevent the build-up occurring in the first place or control the hazard if this is not achievable.

Refer section 8 of the Mining and Quarrying Safety and Health Regulations 2001.

Number	Substandard Condition or Practice	Due Date
3	**ROM reclaim tunnel escape way**	**05/09/2014**

At the time of inspection, the ROM reclaim tunnel escape way was still blocked off and appeared to have deteriorated since 2011. Mr De Carolis put an interim hold on the entry of the tunnel.

The SSE is to ensure that the risk from operations of working in the tunnel is reassessed to ensure that the risk is at an acceptable level and that any emergencies are capable of being managed within the mines emergency management capabilities. This should be also checked against any controls identified in the mine's risk assessment for reasonably foreseeable scenarios.

Refer Sections 7, 8 and 32 of the Mining and Quarrying Safety and Health Regulations 2001.

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Damian Lee
Inspector of Mines
Northern Region


Management Position - Reclaim Tunnel.msg


Mines Inspectorate Visit Response.msg


Cannington Processing Dept corrective action status from inspection 12 08 2014.msg

Queensland Government

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Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Damian Lee, Inspector of Mines (Chemical)

Subject:	**Procedures Isolation**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	12/08/2014
Record Date:	22/08/2014	**MRE Item No.:**	1

Title: Procedure for cleaning MSA window

Description of Action Required to be Taken:
At the time of inspection the procedure for cleaning the MSA window did not reflect adequate isolation of the courier head. This included relying on opening the access door at the right time to trip out the head instead of using the control panel to position the head. The isolation technique of using the door switch could also be circumvented very easily and did not positively isolate the head.

The mine is to review and update the procedure SWI - PP0330C - MSA Window Cleaning to address the issue of positioning the head for cleaning and effectively isolating the head. This may require modifications to the head isolation switch.

Refer section 103 of the Mining and Quarrying Safety and Health Regulations 2001.

References:
MQSHR 103

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 05/09/2014

Completed: 10/09/2014**, Closed by:** Damian Lee **on** 11/09/2014 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Procedure and isolation now updated

Queensland Government

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Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Damian Lee, Inspector of Mines (Chemical)

Subject:	**Falling rocks**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	12/08/2014
Record Date:	22/08/2014	**MRE Item No.:**	2

Title: Material build up at the head of CV04

Description of Action Required to be Taken:
At the time of inspection a significant amount of material had accumulated under the conveyor at the head of CV04 conveyor. This material created a falling object hazard to the SAG mill maintenance floor below.

The area is to be barricaded until such time the area is cleared of the build-up. Other controls also need to be considered to wither prevent the build-up occurring in the first place or control the hazard if this is not achievable.

Refer section 8 of the Mining and Quarrying Safety and Health Regulations 2001.

References:
MQSHR 8

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 05/09/2014

Completed: 10/09/2014**, Closed by:** Damian Lee **on** 11/09/2014 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

CV04 head chute cleared

Queensland Government

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Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Damian Lee, Inspector of Mines (Chemical)

Subject:	**Escape Way**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	12/08/2014
Record Date:	22/08/2014	**MRE Item No.:**	3

Title: ROM reclaim tunnel escape way

Description of Action Required to be Taken:
At the time of inspection, the ROM reclaim tunnel escape way was still blocked off and appeared to have deteriorated since 2011. Mr De Carolis put an interim hold on the entry of the tunnel.

The SSE is to ensure that the risk from operations of working in the tunnel is reassessed to ensure that the risk is at an acceptable level and that any emergencies are capable of being managed within the mines emergency management capabilities. This should be also checked against any controls identified in the mine's risk assessment for reasonably foreseeable scenarios.

Refer Sections 7, 8 and 32 of the Mining and Quarrying Safety and Health Regulations 2001.

References:
MQSHR 7, 8, 32

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 05/09/2014

Completed: 21/08/2013**, Closed by:** Damian Lee **on** 26/08/2014 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Controls reviewed as per attached email

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	16/04/2014

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

Today I attended site to follow up on the progress of the investigation into the sulphuric acid spill on 30 March 2014. I met with Mr Mauricio Rocha (Processing Manager) and Mr Johan Van Der Merwe (Productivity and Improvement Manager). Mr Van Der Merwe delivered a presentation on the progress so far. This included the investigation procedure that is now used at Cannington and the key findings to date on the root causes.

The root causes identified at the time of inspection included:

- removal of redundant cabling inadvertently creating an open instrument circuit (not identified during planning);
- less than adequate communication between maintenance and operations once this open circuit issue was discovered; and
- a blocked/isolated overflow line from the stock tank back to the bulk storage tank

Mr Van Der Merwe, Mr Rocha and I then inspected the reagent area including the warehouse area of the spill, stock tank and bund, and bulk storage tanks. It was noted that the overflow line from the stock tank could be directed to either Tank A (out of commission) or Tank B (current operational tank). The line had a three was valve that was locked and tagged (2/4/14) that stated "*Valve isolated to Tank A* ". However, the tag also read "* *Drain line to tank B blocked* ." It was not obvious to the casual observed what position the valve was respect to which lines the three way valve was open to.

In the absence of further available information at the time, I issued an oral directive to Mr Van Der Merwe and (later) to Mr Troy Wilson (SSE) to suspend any use of the stock tank until it could be verified that the line was clear. The full directive in writing is located below.

The overflow line from the spill tray/bund surrounding the stock tank currently discharges directly into the warehouse next to the alum tanks where reagent operators frequent. I enquired with Mr Rocha and Mr Van Der Merwe whether or not this overflow/drain line couldn't be redirected into the main acid storage bund. Mr Rocha and Mr Van Der Merwe advised that they would consider this as part of the investigation.

While inspecting the main bund I observed significant concrete wear and corrosion in the acid bund area. This included the seals between concrete slabs and the spills sump itself. I have issued an SCP below to rectify this.

Following this I then met with the reagent operator Mr Jamie Howarth and inspected the reagent mixing shed for xanthate and SMBS. I noted that the internal bags of xanthate were labelled in compliance with the ADG code (this had previously been an issue across industry).

Number	Directive	Due Date

Pursuant to section 164 of the Mining and Quarrying Safety and Health Act 1999

1 Use of strong acid stock tank **16/04/2014**

At the time of inspection the available evidence suggested that the overflow line from the strong acid stock tank to the bulk storage tanks was blocked. In the absence of any further available information on the day I believe that the operation of this system may reach an unacceptable level of risk.

Pursuant to section 164 of the Mining and Quarrying Safety and Health Act 1999 I am issuing a directive to suspend operation of the strong acid stock tank system. This directive will remain in place until such time the site senior executive is satisfied that the overflow line from the stock tank to the bulk storage tank B is clear of obstructions/blockages. Confirmation of this will also need to be forwarded to this office.

It is also recommended that the position of the three way vales are clearly labelled to indicate their function.

Number	Substandard Condition or Practice	Due Date

2 Sulphuric acid storage bund **16/09/2014**

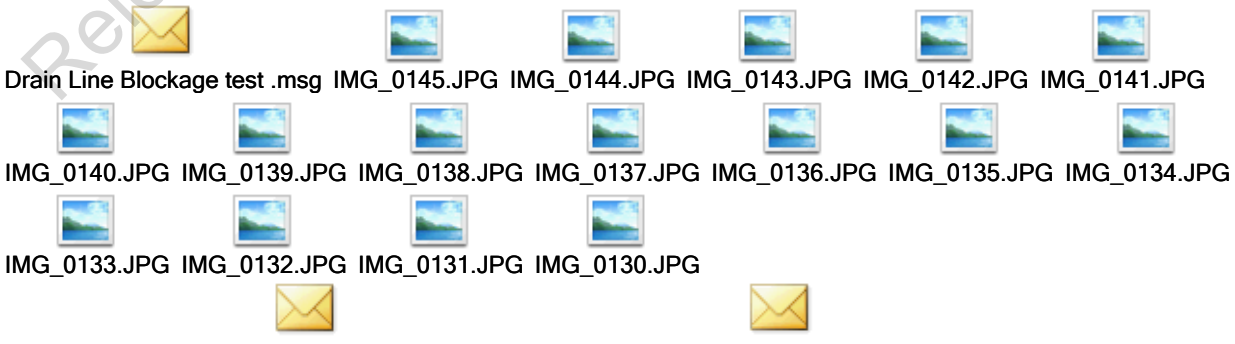
At the time of inspection the condition of the sulphuric acid bund had advanced signs of concrete corrosion and concrete seals deteriorated or missing completely.

The mine is to ensure that a program of rehabilitation and resealing is completed in the area to ensure that the integrity of the bund in maintained.

Refer section 56 and 109 of the Mining and Quarrying Safety and Health Regulations 2001.

Please provide a written status report on each Directive and SCP together with the actions taken to address each item by their due dates

Damian Lee
Inspector of Mines
Northern Region



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Phone: (07) 4747 2158, Fax: (07) 4743 7165

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Directive

I Damian Lee, an Inspector appointed under Section 122, of the Mining and Quarrying Safety and Health Act 1999 issue a Directive to suspend operations for unacceptable level of risk, pursuant to Section 164 of the Mining and Quarrying Safety and Health Act 1999.

Subject:	**Chemical Storage**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	16/04/2014
Record Date:	22/04/2014	**MRE Item No.:**	1

Title: Use of strong acid stock tank

Directive Given:
At the time of inspection the available evidence suggested that the overflow line from the strong acid stock tank to the bulk storage tanks was blocked. In the absence of any further available information on the day I believe that the operation of this system may reach an unacceptable level of risk.

Pursuant to section 164 of the Mining and Quarrying Safety and Health Act 1999 I am issuing a directive to suspend operation of the strong acid stock tank system. This directive will remain in place until such time the site senior executive is satisfied that the overflow line from the stock tank to the bulk storage tank B is clear of obstructions/blockages. Confirmation of this will also need to be forwarded to this office.

It is also recommended that the position of the three way vales are clearly labelled to indicate their function.

References:
MQSHA 164

A person to whom a directive is given must comply with the directive as soon as reasonably practicable. Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 16/04/2014

Completed: 16/04/2014**, Closed by:** Damian Lee **on** 22/04/2014 12:00:00 AM.

Action Taken by Mine to Comply with Directive:

Ceased using system on the day

Directive -

1. If an inspector, inspection officer or district worker's representative believes risk from mining operations is not at an acceptable level, the inspector, officer or representative may give a directive to any person to suspend operations in all or part of the mine.
2. The directive must be given orally or by notice.
3. If the directive is given orally, the person giving the directive must confirm the directive by notice to the person in control of the mine or part of the mine affected by the directive and to the relevant site senior executive.
4. Failure to comply with subsection 3. does not affect the validity of the directive.

Method of Giving Directive -
This directive was given orally on 16/04/2014 at 09:00 AM.

Directive Given To -
This directive is given to the following person/s -

Troy Wilson SSE
Mauricio Rocha
Johan Van Der Merwe

Method of Identification Used -
In issuing this directive I identified myself as a person appointed under Section 122 of the Mining and Quarrying Safety and Health Act 1999.
Displayed my identity card so it is clearly visible to the other person on 16/04/2014 at 09:00 AM.

Part of mine affected by directive -
Sulphuric Acid Storage Tank.

A copy of the directive was given to -
A copy of this directive or notice was given to the person in control of the mine or part of the mine affected by the directive on 22/04/2014 at 04:00 PM.

A copy of this directive or notice was given to Site Senior Executive on 22/04/2014 at 03:45 PM.

In giving this directive I believe risk from operations is not at an acceptable level.

The reason for my belief or suspicion is based upon the following -
the current tag states that the line to Tank B is blocked

Operations at the mine or the parts of the mine specified are suspended until the above action is taken.

Damian Lee: ..... Date Issued: ..... / ..... / .....

Warning - Failure to comply with this directive is an offence. If you disagree with this directive, you may apply for a review of the directive. A summary of the review provisions is provided below.

Provisions of the Mining and Quarrying Safety and Health Act 1999 in Relation to Directives

171. Directives

(1) If an inspector, inspection officer or district workers' representative has given a directive, the inspector, officer or representative -
(a) must enter it in the mine record as soon as reasonably practicable after giving it; and
(b) must state the reason for the directive in the mine record.

(2) A person to whom a directive is given must comply with the directive as soon as reasonably practicable.
Maximum penalty - 800 penalty units or 2 years imprisonment.

(3) The site senior executive must enter in the mine record the action taken to comply with the directive as soon as practicable after the action is taken.
Maximum penalty - 40 penalty units.

(4) The site senior executive must make copies of directives available for inspection by workers.
Maximum penalty - 40 penalty units.

(5) A directive remains effective until -
(a) for a directive by a district workers' representative - it is withdrawn in writing by the representative or an inspector; or
(b) for a directive by the chief inspector - it is withdrawn in writing by the chief inspector; or
(c) for a directive by an inspector other than the chief inspector - it is withdrawn in writing by the inspector or another inspector; or
(d) for a directive of an inspection officer - it is withdrawn in writing by the inspection officer or an inspector; or
(e) for a directive by a district workers' representative, an inspection officer or an inspector and not otherwise withdrawn - the chief inspector varies or sets aside the directive after reviewing it under subdivision 4; or
(f) the Industrial Court stays, varies or sets aside the directive.

Subdivision 4 - Review of directives

172. Application for review

A person who has received a directive from an inspector (other than the chief inspector), inspection officer or district workers' representative may apply under this division for the directive to be reviewed.

173. Procedure for review

(1) The application must -
(a) be made in writing to the chief inspector; and
(b) be supported by enough information to allow the chief inspector to decide the application.

(2) The application must be made to the chief inspector within -
(a) 7 days after the day on which the person received the directive; or
(b) the longer period, within 2 months after the day, the chief inspector in special circumstances allows.

(3) The chief inspector must consider the application within 7 days after receiving it and immediately advise the applicant in writing whether the chief inspector considers the applicant has complied with subsection (1).

(4) If the chief inspector does not consider the application is supported by enough information to allow the chief inspector to decide the application, the chief inspector must advise the applicant what further information the chief inspector requires.

(5) When the chief inspector is satisfied the applicant has complied with subsection (1), the chief inspector must immediately advise the applicant in writing of that fact.

174. Review of directive

(1) The chief inspector must, within 14 days after giving the advice mentioned in section 173(5), review the directive and make a decision (the **"review decision**") -
(a) to confirm the directive appealed against; or
(b) to vary or set aside the directive appealed against.

(2) The chief inspector may give a directive in substitution for a directive the chief inspector decides to set aside.

(3) Within 7 days after making the review decision, the chief inspector must give notice of the decision to the applicant.

(4) The notice must -

(a) include the reasons for the review decision; and
(b) if the notice does not set aside the directive, tell the applicant of the applicant's right of appeal against the decision.

(5) If the chief inspector does not -
(a) review the directive within the time allowed under subsection (1); or
(b) having reviewed the directive, advise the applicant of the review decision within the time allowed under subsection (3); the applicant may appeal against the directive under part 13.

175. Stay of operation of directive

(1) If a person applies under this division for a directive to be reviewed, the person may immediately apply to the Industrial Court for a stay of the directive.

(2) The court may stay the directive to secure the effectiveness of the review and any later appeal to the court.

(3) A stay -
(a) may be given on conditions the court considers appropriate; and
(b) operates for the period fixed by the court; and
(c) may be revoked or amended by the court.

(4) The period of a stay must not extend past the time when the chief inspector reviews the directive and any later period the court allows the person to enable the person to appeal against the decision.

(5) An application made for a review of a directive affects the directive, or the carrying out of the directive, only if the directive is stayed.

(6) However, a directive under section 164 must not be stayed.

Queensland Government

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Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Damian Lee, Inspector of Mines (Chemical)

Subject:	**Bund**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	16/04/2014
Record Date:	22/04/2014	**MRE Item No.:**	2

Title: Sulphuric acid storage bund

Description of Action Required to be Taken:
At the time of inspection the condition of the sulphuric acid bund had advanced signs of concrete corrosion and concrete seals deteriorated or missing completely.

The mine is to ensure that a program of rehabilitation and resealing is completed in the area to ensure that the integrity of the bund in maintained.

Refer section 56 and 109 of the Mining and Quarrying Safety and Health Regulations 2001.

References:
MQSHR 56 and 109

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 16/09/2014

Completed: 10/10/2014**, Closed by:** Damian Lee **on** 21/10/2014 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Plan in place

Department of Natural Resources and Mines
Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Investigation	Northern	06/12/2012

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

Today I attended site to conduct a preliminary investigation into the incident involving a vacuum truck fire and explosion on 5/12/12. I was met and accompanied by Mr Tony Gordon (Mill superintendent) and MR Mauricia Rocha (Metallurgy Manager). We were also later joined by Mr Steve Fardner (Clean It General Manager).

I inspected the scene which was still barricaded. Mr Gordon indicated where shrapnel from the explosion ended up - about 30 m away. During discussions I was informed that the workers had been vacuuming material from the sump in the reagent storage bund. Evidence was visible that some material had been leaking from the xanthate tank to the sump. Xanthate itself is spontaneously combustible, however it can also break down into carbon disulphide and ethanol (both are flammable and have the potential to create an explosive atmosphere) and can react in various ways creating various flammable reaction products.

I was also informed that if the vacuum pump stops, it then rotates backwards. This combined with the fire already in the vacuum pump area is one possible ignition source for the explosion. This aside, the investigation will still need to determine what the cause of the original fire was.

One of the outcomes of this incident should be to ensure that any workers completing a similar task of pumping out reagent areas should be made aware of any potentially flammable/explosive materials in the area.

Damian Lee
Inspector of Mines
Northern Region

Queensland Government

Department of Natural Resources and Mines
Mount Isa District Office
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Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	04/07/2012

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

Site Safety & Health Reps Consulted: Matthew Pershouse

Today I attended site to complete an inspection of the emergency response and preparedness at Cannington. I met with Mr Steve Hambrecht (Specialist Asset Protection) and reviewed the systems in place to manage emergency response. This included:

- the manning levels and who was on-site at any given day
- the Crisis and Emergency Management Manual (PRO-HSEC0050)
- major incident room and equipment
- training records and training plan for ERT members
- emergency call-out system "Whispir"
- scenario based drills and exercises including planned exercises

Following this I met with Rhett Haslett (Senior Production Engineer) where we discussed locations of ERBs on different levels to the work area. Cannington have currently adopted a policy of no more than 750 m or 15 minutes maximum distance from a work area. I referred both Mr Haslett and Mr Hambrecht back to complete a risk assessment on the location based on the local conditions of each task if the mine wanted to place ERBs on different levels to where the work was being completed.

Following this Mr Adam Self (Scheduling Engineer) then accompanying Mr Hambrecht and myself on an inspection of refuge bays (Fresh air chambers) and ladder ways. At 275mlv I met Mr Matthew Pershouse (SSHR and serviceman). We discussed the locations of the FACs nearest to that location. Mr Perhouse was able to locate 2 nearby - 300mlv and 240mlv. I also sighted a copy of the mine plan showing ventilation direction and infrastructure and other installed emergency services.

We then walked to FAC #3 located on 300mlv via the decline where I inspected the condition and equipment in the FAC. I sighted the inspection logbook with the last entry 11/5/12 and found everything else in order at the time of inspection. Returning the vehicle I inspected the condition of the ladder way to 275 mlv. While at this level I observed the scaling crew operating from an IT. I pulled up the job to talk with the cerw - Mr Pershouse, Mr Martin Cleaver and Mr Jamie Hamilton. I was able to sight the Take 5 and prestart for the IT.

Following this Mr Self, Mr Hambrecht and I then inspected the FAC #5 located at MA 258. No issues were observed at this FAC.

Upon returning to the surface, I sighted electrical inspection and radio check records for FAC #3 and #5 from Mr Brian Moore (A/Electrical Supervisor). Prior to leaving site I inspected the backup emergency response container located at the camp.

There were only two significant issues highlighted during the inspection. The first relates to terminology for the FACs. A number of different terms are used including Fresh Air Chambers (as opposed to Fresh Air Base used in rescue team set up) and Refuges. The naming needs to be consistent across all areas so any confusion of terms is reduced or eliminated. General industry terminology refers to them as emergency refuge bays or chambers.

Secondly, the legislation specifically requires a mine to conduct a risk assessment of reasonably foreseeable emergencies at the mine to decide the resources, facilities and procedures necessary to detect, manage and respond to emergencies (section 32 of the Regulations). This in turn drives the processes, procedures, training and equipment the mine will need to respond to emergencies for that site. At the time of inspection I was not able to sight such a risk assessment. While there was certainly many sound procedures and practices in place it was not apparent that they tied into what was actually required at Cannington mine itself (was driven from worldwide corporate standards which may or may not be appropriate for Cannington operations). I have issued an SCP with a time line based on discussions with Mr Hambrecht.

Number	Substandard Condition or Practice	Due Date
1	**Risk management for emergencies**	**10/08/2012**

At the time of inspection I was not able to site a risk assessment of reasonably foreseeable emergencies at the mine to decide the resources, facilities and procedures necessary to detect, manage and respond to emergencies as required under section 32 of the Mining and Quarrying Safety and Health Regulations 2001. The mine is to ensure that a risk assessment as required under this section is completed and that the mines current resources are checked against the requirements identified.

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Damian Lee
Inspector of Mines
Northern Region

Queensland Government
Natural Resources, Mines and Water

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Damian Lee, Inspector of Mines (Chemical)

Subject:	**Emergency Management**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	04/07/2012
Record Date:	11/07/2012	**MRE Item No.:**	1

Title: Risk management for emergencies

Description of Action Required to be Taken:
At the time of inspection I was not able to site a risk assessment of reasonably foreseeable emergencies at the mine to decide the resources, facilities and procedures necessary to detect, manage and respond to emergencies as required under section 32 of the Mining and Quarrying Safety and Health Regulations 2001. The mine is to ensure that a risk assessment as required under this section is completed and that the mines current resources are checked against the requirements identified.

References:
t

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 10/08/2012

Completed: 09/08/2012**, Closed by:** Damian Lee **on** 20/08/2012 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Risk assessment provided

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Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	22/05/2012

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today I attended site to conduct an inspection on the storage and handling of dangerous goods and hazardous substances. After a briefing meeting with Mr David Vize (Acting Processing Manager), I was accompanied by Mr Steve Shellshear (Supervising Chemist) on and inspection of the laboratory including the liquid and dry dangerous goods storage rooms, wet chem lab, met lab, sample prep area including the new automatic pulveriser, fire assay room and the XRF prep room. I also sighted copies of the inspections for the fume hoods including the relevant procedure SWI-cd4212. During the inspection of the laboratory I also met and spoke with Mr Dan Grieves (Met Tech) and Mr Brett Achilles. The issues found in the laboratory included incompatible storage of xanthate (4.1) with spray cans (2.1) in the storage cabinet in the met lab, some bottles with unreadable labels in the met lab, and 9 cylinders of argon in a "manpack" stored outside the designated shed (laboratory gas storage) in a traffic area. The argon bottles had been moved inside the area by the end of my inspection.

I also attended the safety recall meeting attended by all management staff.

Following the lab and safety meeting, I was accompanied by Mr Andrew Cantarutti (Senior Metallurgist) on and inspection of the bulk dangerous goods storage tanks and sheds, the reagent mixing facilities, RO plant and the concentrator reagent addition points. During the inspection Mr Owen Roberts (Reagent Operator) detailed the mixing procedures for aluminium sulphate, SMBS and SEX. During the inspection the following issues were found:

- SEX bulky bags bags were not labelled by supplier (outside box was labelled - Please note that since the inspection, the xanthate supplier has been contacted to correct the labelling of the xanthate bags)

- many pipe labels had deteriorated and were unreadable

- many reagent addition points were poorly secured and not signed as addition points

- large cracks in the reagent storage at the concentrator

Number	Substandard Condition or Practice	Due Date
1	**Reagent addition lines**	**15/06/2012**

At the time of inspection there were a number of reagent addition lines in the concentrator that were poorly secured (could easily be knocked and splash reagent into works areas) and were

not signed as such. Ensure that all reagent addition lines are secured in a manner so that this cannot occur and that all reagent addition point are appropriately labelled to identify the reagents at the point. Refer sections 8, 53 and 56 of the Mining and Quarrying Safety and Health Regulations 2001.

Number	Substandard Condition or Practice	Due Date
2	**Pipe labelling**	**22/06/2012**

At the time of inspection a number of pipe labels were sun damaged and unreadable. Ensure that all pipes are labelled as per AS1345 required under section 53 of the Mining and Quarrying Safety and Health Regulations 2001.

Number	Substandard Condition or Practice	Due Date
3	**Chemical storage in the Met Lab**	**15/06/2012**

At the time of inspection a number of incompatible chemicals were stored together. Some bottles of chemicals also had unreadable labels. Ensure that only compatible chemicals are stored in the same storage areas and that all labels clearly identify the contents and associated information as per sections 53 and 56 of the Mining and Quarrying Safety and Health Regulations 2001.

Number	Substandard Condition or Practice	Due Date
4	**Cracks in bunding at flotation area**	**20/07/2012**

At the time of inspection a number of large cracks had appeared in the reagent storage tank bund next to the flotation area. This compromises the integrity of the bunding. Ensure that the cracks are sealed in an appropriate manner to ensure the integrity of the bunding. Refer section 56 of the Mining and Quarrying Safety and Health Regulations 2001.

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Damian Lee
Inspector of Mines
Northern Region



MRE Responses - Cannington Mine.msg RE MRE Responses - Cannington Mine.msg File # 9748 02.msg


Mine Record Entry File no 9748 02.msg MRE 9748 02 Item 4 Repair Cracks in Reagents Bund Floor.msg

Department of Natural Resources and Mines
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Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Damian Lee, Inspector of Mines (Chemical)

Subject:	**Reagents**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	22/05/2012
Record Date:	25/05/2012	**MRE Item No.:**	1

Title: Reagent addition lines

Description of Action Required to be Taken:
At the time of inspection there were a number of reagent addition lines in the concentrator that were poorly secured (could easily be knocked and splash reagent into works areas) and were not signed as such. Ensure that all reagent addition lines are secured in a manner so that this cannot occur and that all reagent addition point are appropriately labelled to identify the reagents at the point. Refer sections 8, 53 and 56 of the Mining and Quarrying Safety and Health Regulations 2001.

References:
h

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 15/06/2012

Completed: 14/06/2012**, Closed by:** Damian Lee **on** 27/06/2012 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Reagent lines secured and labelled as per attachment in MRE

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Substandard Condition or Practice

Issued By: Damian Lee, Inspector of Mines (Chemical)

Subject:	**Pipe Labelling**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	22/05/2012
Record Date:	25/05/2012	**MRE Item No.:**	2

Title: Pipe labelling

Description of Action Required to be Taken:
At the time of inspection a number of pipe labels were sun damaged and unreadable. Ensure that all pipes are labelled as per AS1345 required under section 53 of the Mining and Quarrying Safety and Health Regulations 2001.

References:
q

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 22/06/2012

Completed: 19/06/2012**, Closed by:** Damian Lee **on** 27/06/2012 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Pipe labelling redone as per attachment in MRE

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Substandard Condition or Practice

Issued By: Damian Lee, Inspector of Mines (Chemical)

Subject:	**Chemical Storage**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	22/05/2012
Record Date:	25/05/2012	**MRE Item No.:**	3

Title: Chemical storage in the Met Lab

Description of Action Required to be Taken:
At the time of inspection a number of incompatible chemicals were stored together. Some bottles of chemicals also had unreadable labels. Ensure that only compatible chemicals are stored in the same storage areas and that all labels clearly identify the contents and associated information as per sections 53 and 56 of the Mining and Quarrying Safety and Health Regulations 2001.

References:
j

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 15/06/2012

Completed: 14/06/2012**, Closed by:** Damian Lee **on** 27/06/2012 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Storage rectified as per attachment in MRE

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Substandard Condition or Practice

Issued By: Damian Lee, Inspector of Mines (Chemical)

Subject:	**Bunding**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	22/05/2012
Record Date:	25/05/2012	**MRE Item No.:**	4

Title: Cracks in bunding at flotation area

Description of Action Required to be Taken:
At the time of inspection a number of large cracks had appeared in the reagent storage tank bund next to the flotation area. This compromises the integrity of the bunding. Ensure that the cracks are sealed in an appropriate manner to ensure the integrity of the bunding. Refer section 56 of the Mining and Quarrying Safety and Health Regulations 2001.

References:
g

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 20/07/2012

Completed: 24/01/2013**, Closed by:** Damian Lee **on** 25/01/2013 12:00:00 AM.

Reassigned Due Date: 21/01/2013; **Review conducted by** Damian Lee **on** 02/01/2013.

Action Taken by Mine to Comply with Corrective Action Requirement:

Bund resealed

Queensland Government

Southern Region Office
P.O. Box 1475, COORPAROO QLD 4151
Phone: (07) 3330 4272, Fax: (07) 3405 5346

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	South32 Cannington Proprietary Limited	Subject Audit or Specific System Audit	Northern	04/03/2015

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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From 4-5 March 2015, I carried out a ventilation specific audit at Cannington Mine assisted by Mr James Coghlan (District Workers Representative), and accompanied by Mr Grant Eggington (Mine Manager), Mr Frikkie Sadie (Scheduling Superintendent), Ms Jessica Black (Ventilation Engineer) and Ms Eloise McMahon (Ventilation Engineer).

During the meeting on site the following matters were discussed and reviewed in relation to mine ventilation:

- Ventilation awareness training: a well-developed and comprehensive presentation was viewed and we were informed that this awareness presentation is delivered to the workforce on a regular basis. Ventilation related operational discipline has apparently improved since the introduction of the abovementioned awareness training but it must be made clear that no unauthorised adjustment of any ventilation control device should be permitted.

- A Trigger Action Response Plan (TARP) for Gas Exposure as well as the working in heat procedures and practices was discussed in relation to heat stress management including the application and definition of “unventilated areas” as defined by the procedure. A bowtie style risk assessment on exposure to irrespirable atmosphere was discussed in detail.

- Diesel Particulate Matter (DPM) and exhaust gas dilution rates in relation to acceptable planning and actual values.

- Velocity in return up cast shafts in the range of 7-12m/s could in some cases cause water droplets build up in the air and form a water blanket. This was also discussed with members of the ventilation team and should be considered during any related risk assessment processes.

- Fire scenario modelling as well as stench gas release and general ventilation related emergency procedures and processes.

- Actual primary and secondary ventilation survey results were viewed and examples of survey templates from other comparable operations were also viewed.

- Training in the use and calibration of gas monitors as well as anemometers and manometers.

Procedures and practices in relation to respirable silica and lead was discussed in relation to Section 135 of the Mining and Quarrying Safety and Health Regulation (MQSHR), the Site Senior Executive has an obligation to limit a workers exposure to a hazard. This includes respirable crystalline silica (RCS). The Site Senior Executive must ensure workers exposure to a hazard at the mine does not exceed the exposure limit applying to the worker for the hazard and is as low as reasonably achievable.

We were informed that a recent audit of the Ventsim model was carried out and found to be within an acceptable level of calibration. We then viewed the Ventsim model and discussed the circuit in detail.

Escapeways

It became apparent during a review of the Ventsim model that various sections of the escape ladderways are in return air. In terms of ensuring that escapeway atmosphere is not compromised (eg underground fire), it is worth investigating various options to attempt to ensure that escapeways are in fresh air and positive pressure.

Escapeways in return air in relation to emergency egress and evacuation is not considered best industry practice and the situation must be risk assessed adequately and the appropriate controls must be implemented. We were informed that the escapeways are not the second means of egress from all areas of the mine and that the hoisting shaft may become the second means of egress in the event of an emergency from two particular levels.

Generally escapeways must be located strategically to manage risk and allow for the passage of rescue persons and rescue equipment, including stretchers; and importantly it must be separated in such a way that an event happening in one of the escapeways would not prevent persons escaping through the other escapeway.

Further legislative requirements also refer to the underground mine manager or, if there is no underground mine manager, the site senior executive, who must ensure each of the escapeways is maintained in a safe, accessible and usable condition and adequately marked or signposted, having regard to the potential for reduced visibility in an emergency.

General

Drawing air from the Fowler downcast hoisting shaft from 440 level to ventilate an underground workshop was discussed in relation to the option to incorporate a filter wall in an attempt to improve air quality and further investigation of this option is advisable.

The responsibility for secondary ventilation work including installation and maintenance work was transferred to the underground supervisory level and this strategy is proving to be effective according to the ventilation department. Based on the underground inspection it must be stated that the secondary circuit on the levels that were inspected was of a good standard in terms of installation and maintenance at the time of the inspection.

Ventilation in the underground crusher chamber was discussed and modelling should take place to investigate the options available to improve ventilation in this area.

A new type of auxiliary fan silencer is on trial and these silencers were viewed and discussed. The methodology and templates involved in issuing a ventilation instruction was discussed as well as the ventilation condition reports. Pre and post blast plans were also viewed and

discussed.

Finally the fan pressure was measured at the collar of a shaft by using a pitot tube and digital manometer and the calculation was used to establish the quantity (m^3/s). The fan duty point was plotted on the fan curve and found to be acceptable in terms of duty based on circuit resistance. I was informed that this method was in use when primary ventilation surveys are conducted on a regular basis.

On completion of our audit we were joined by Mr Phil Casey (District Inspector of Mines) and held a close out meeting with Mr Eggington, Ms Black, Ms McMahon and Mr Sadie.

Number	Substandard Condition or Practice	Due Date
1	**Ventilation in Escapeways**	**01/06/2015**

Complete by risk assessment a review of all escapeways from any area of the mine, with priority on working areas.

The risk assessment must include the following points:
1. Escapeways cannot be contaminated by an atmosphere that may be harmful to a person nor restrict visibility during an unaided escape from any area of the mine.
2. Escapeways are maintained under a positive pressure during emergency events that are foreseeable in the underground workings.

A copy of the risk assessment and the projected timeline for corrective actions shall be forwarded to IOM Esterhuizen and DIOM Casey to allow monitoring of the progress of the rectification works.

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Deon Esterhuizen
Inspector of Mines
Southern Region

RE Mine Record Entry - Cannington.msg

Queensland Government

Southern Region Office
P.O. Box 1475, COORPAROO QLD 4151
Phone: (07) 3330 4272, Fax: (07) 3405 5346

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Deon Esterhuizen, Inspector of Mines (Mining)

Subject:	**Ventilation Management**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Cannington Pty Ltd
Activity:	Subject Audit or Specific System Audit	**Activity Date:**	04/03/2015
Record Date:	16/03/2015	**MRE Item No.:**	1

Title: Ventilation in Escapeways

Description of Action Required to be Taken:
Complete by risk assessment a review of all escapeways from any area of the mine, with priority on working areas.

The risk assessment must include the following points:
1. Escapeways cannot be contaminated by an atmosphere that may be harmful to a person nor restrict visibility during an unaided escape from any area of the mine.
2. Escapeways are maintained under a positive pressure during emergency events that are foreseeable in the underground workings.

A copy of the risk assessment and the projected timeline for corrective actions shall be forwarded to IOM Esterhuizen and DIOM Casey to allow monitoring of the progress of the rectification works.

References:
MQSHR Sections 32 and 36.

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 01/06/2015

Completed: 03/06/2015**, Closed by:** Deon Esterhuizen **on** 03/06/2015 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Reviewed documentation received from SSE.

Queensland Government

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Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	South32 Cannington Proprietary Limited	Inspection	Northern	07/07/2015

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Accompanied by Mr James Coghlan (District Workers' Representative), I conducted a mobile plant inspection.

After completion of a visitor induction, I met with Mr Adam Bamford (Maintenance and Analysis and Improvement Superintendent) and Mr Glenn Loveday (Maintenance Manager).

Afterwards and with the assistance of Adam, I reviewed Cannington documentation and procedures. The following was noted.

- Redpath is engaged as a contractor to haul ore to the ROM pad. Redpath operate and maintain their own equipment and have their workshop but also utilises the Cannington workshop for maintenance of their heavy vehicles.
- I sighed various mobile equipment service check sheets, procedures and OEM manuals. These are available from iPick.
- Light vehicle and heavy vehicle maintenance personnel including electricians complete a level two tire inspection and assessment course to assess whether or not a tire needs to be repaired/replaced.
- Tire repair/replacement is managed by a contractor off site. Trained on-site maintenance staff assess tires and prepare their transfer to the tire contractor.
- I sighted various 250 hour, 500 hour, 1000 hour and 2000 hours service check lists. Each equipment has a single service check list that allows for the 250 hour, 500 hour, 1000 hour and 2000 hour service to be conducted. Any task/activity which is not relevant for a particular service is greyed out.
- Completed tasks/activities on a service check list are initialled by the maintenance person. After completion of the full service, the service check list is signed off by the maintenance person as well as the maintenance supervisor. Numerous completed service check lists were sighted.
- Service check lists include OEM specifications for easy reference.
- Any measurements obtained by maintenance personnel as part of the service is recorded on the service check list.
- Service check lists provide space to include description of the maintenance work,

however, descriptions sighted were brief and do not provide enough clarification on what the work entailed. For example, I sighted a 1000 hour service check list where maintenance personnel identified and a leak and included the description "hoist valve". Adam nor any other person could explain what the comment meant, e.g. whether a hoist valve was leaking, a hoist valve was repaired or a hoist valve was replaced. It is recommended that maintenance personnel include more detail, for example leaking hoist valve was replaced.

- OEM specifications for the torquing of certain fasteners is listed on service check lists. It is recommended that for verification purposes, maintenance personnel also record the actual torque value to which the fastener was torqued too.
- SAP is used to record maintenance details. Scanned copies of the service check lists are attached to the relevant SAP entry.
- All mobile equipment including cranes attached to trucks are undergoing pre-checks prior to being allowed on site.
- A brake system maintenance procedure for mobile equipment was sighted. I also sighted a brake card located in the cabin of a Redpath light vehicle. The brake card lists each step to conduct a brake test.
- Maintenance personnel conduct brake tests on mobile equipment at a frequency of seven days.
- Brake tests are also conducted prior to maintenance work commencing.
- If brake system maintenance testing deviate from the OEM recommendations, a risk assessment is conducted. No documentation could be sighted to confirm this.
- Mobile equipment modification and approval is managed through a risk assessment and management of change. No documentation was sighted.
- Cannington general and site specific workshop induction is required to conduct work in the Cannington workshop. An additional Redpath site specific induction is required to work in the Redpath workshop.
- At the present, various types of Take 5s are used on site. None of these require supervisor sign off. Adam advised that a new single type of Take 5 will be issued in the future.

I then conducted an inspection of the workshops. I was accompanied by Adam and during the Redpath workshop inspection by Mr Dean Callanan (Redpath Maintenance Supervisor). The following was noted:

- Adam advised that the 10T overhead crane is maintained by NQ Cranes at a frequency of 3 months. No documentation was sighted.
- The only work in progress during the inspection of the Cannington workshop was conducted by a Redpath contractor and a Caterpillar employee; replacing hydraulic cylinders on the LD21, a CAT 988H loader owned by Caterpillar and hired and operated by Redpath.
- I sighted the Take 5 completed by the maintenance crew replacing the hydraulic cylinders on the loader. All hazards/risk seemed to have been identified and controls as outlined in the Take 5 were in place.
- I sighted pre-start log books located in the cabin of the LD21 loader and LV1338, a Redpath light vehicle that was undergoing repair work in the Redpath workshop. The pre-start log books seemed to be completed correctly by operators, however, only a few of the blue log sheets in the log book were signed off by supervisors. I was informed that only the white copies are signed off by supervisors. After return to the office, I sighted

white copies that were signed off by the supervisor. It is recommended that operators ensure all copies (the white and blue copies) are signed off supervisors.

- I noticed that the operator of the LV1338 identified a fuel leak during the pre-start check. Dean advised that in accordance with the procedure, the operator informed maintenance personnel who then inspected the fuel leak. Maintenance personnel assessed the fuel leak as minor and allowed LV1338 to be operated for the reminder of the shift. Apparently, the light vehicle operated underground and at the end of the shift LV1338 was brought in for repair.

After return to the office, Adam introduced me to Mr Cameron Momish (Senior Specialist Analyst and Improvement Mining). I debriefed with Adam and Cameron prior to leaving site.

Number	Substandard Condition or Practice	Due Date
1	**Light vehicle fuel leak**	**17/08/2015**

The operator of a light vehicle identified a fuel leak during the pre-start check. In accordance with site procedure, the operator informed maintenance personnel of the fuel leak. Maintenance personnel inspected the fuel leak, assessed it as minor and allowed the light vehicle to be operated normally for the reminder of the shift. During the shift the light was operating underground and brought for repair at the end of the shift.

Ensure all personnel are aware and follow risk management practices and procedures in accordance with the Cannington Safety and Health Management Plan and legislation in particular the MQSHA 1999 S26 and the MQSHR 2001 S7, S8, S9, S10 and S11.

Number	Recommendation	Due Date
2	**Pre-start book sign off**	**N/A**

I sighted pre-start log books which seemed to be completed correctly by operators. However, only a few of the blue log sheets in the log books were signed off by supervisors and I was informed that only white copies which are handed over to the supervisor are signed off by the supervisor. After return to the office, I sighted numerous white copies that included the signature of the supervisor.

It is recommended that operators ensure all copies including the blue copies remaining in the log book are signed off by the supervisor.

Number	Recommendation	Due Date
3	**Record of maintenance details**	**N/A**

The service check lists allow for some description of the maintenance work to be included. I sighted a 1000 hour service check list that included the description "hoist valve", however, I was not able to obtain an explanation of what the description meant or what the actual work involved.

It is recommended to include more descriptive comments so that personnel reviewing the service check list know what the work involved, for example: hoist valve was leaking and replaced.

Number	Recommendation	Due Date
4	**Record of torque value**	**N/A**

OEM specifications for the torquing of certain fasteners is listed on service check lists. It is recommended that for verification purposes, maintenance personnel also record the actual

torque value to which the fastener was torqued too.

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Hans Sattler
Inspector of Mines
Northern Region

MRE - Light vehicle fuel leak_GE_170815.pdf

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Hans Sattler, Inspector of Mines (Mechanical)

Subject:	**Maintenance of mobile plant**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	South32 Cannington Proprietary Limited
Activity:	Inspection	**Activity Date:**	07/07/2015
Record Date:	20/07/2015	**MRE Item No.:**	1

Title: Light vehicle fuel leak

Description of Action Required to be Taken:
The operator of a light vehicle identified a fuel leak during the pre-start check. In accordance with site procedure, the operator informed maintenance personnel of the fuel leak. Maintenance personnel inspected the fuel leak, assessed it as minor and allowed the light vehicle to be operated normally for the reminder of the shift. During the shift the light was operating underground and brought for repair at the end of the shift.

Ensure all personnel are aware and follow risk management practices and procedures in accordance with the Cannington Safety and Health Management Plan and legislation in particular the MQSHA 1999 S26 and the MQSHR 2001 S7, S8, S9, S10 and S11.

References:
MQSHA 1999 S26, MQSHR 2011 S7, S8, S9, S10, S11.

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 17/08/2015

Completed: 17/08/2015**, Closed by:** Hans Sattler **on** 04/09/2015 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Refer attachment

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Recommendation

Subject:	**Document and Procedures**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	South32 Cannington Proprietary Limited
Activity:	Inspection	**Activity Date:**	07/07/2015
Record Date:	20/07/2015	**MRE Item No.:**	2

Title: Pre-start book sign off

Description of Action Recommended to be Taken:
I sighted pre-start log books which seemed to be completed correctly by operators. However, only a few of the blue log sheets in the log books were signed off by supervisors and I was informed that only white copies which are handed over to the supervisor are signed off by the supervisor. After return to the office, I sighted numerous white copies that included the signature of the supervisor.

It is recommended that operators ensure all copies including the blue copies remaining in the log book are signed off by the supervisor.

References:
dd

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Vision: Our Industries Free of Safety and Health Incidents

Recommendation

Subject:	**Documented Maintenance Program**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	South32 Cannington Proprietary Limited
Activity:	Inspection	**Activity Date:**	07/07/2015
Record Date:	20/07/2015	**MRE Item No.:**	3

Title: Record of maintenance details

Description of Action Recommended to be Taken:
The service check lists allow for some description of the maintenance work to be included. I sighted a 1000 hour service check list that included the description "hoist valve", however, I was not able to obtain an explanation of what the description meant or what the actual work involved.

It is recommended to include more descriptive comments so that personnel reviewing the service check list know what the work involved, for example: hoist valve was leaking and replaced.

References:
dd

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Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Recommendation

Subject:	**Maintenance Items**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	South32 Cannington Proprietary Limited
Activity:	Inspection	**Activity Date:**	07/07/2015
Record Date:	20/07/2015	**MRE Item No.:**	4

Title: Record of torque value

Description of Action Recommended to be Taken:
OEM specifications for the torquing of certain fasteners is listed on service check lists. It is recommended that for verification purposes, maintenance personnel also record the actual torque value to which the fastener was torqued too.

References:
dd

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P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	South32 Cannington Proprietary Limited	Postal Mine Record Entry	Northern	12/05/2015

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

In the past few years, the Mines Inspectorate noted an increase in high potential incidents involving winders. The two major reasons for winder incidents include brake failures and electrical failures.

A winder forum was held in Mount Isa on Tuesday 19 May 2015 to inform industry of this, create discussion between mine operations and to provide guidance on the requirements for winding maintenance, testing and inspection, in particular brake systems so that a person at a mine site who has the obligation under the Act can ensure the health and safety of personnel due to winding operations is at an acceptable level. The forum focused mainly on brake hold testing, but future forums are anticipated to enable further topics for discussion.

The forum was attended by mine personnel from numerous mine sites incorporating winders in their operation or shaft sinking process.

This mine record summarises the Mines Inspectorate's minimum expectations on maintenance processes, procedures and brake hold testing.

Maintenance Procedures
In accordance with MQSHR 2001 S 128 Monitoring and maintaining winding equipment
The site senior executive must ensure the mine has written procedures for monitoring and maintaining winding equipment in use at the mine.

The Mines Inspectorate expects mine operations to review and if deemed necessary amend their winder maintenance processes and procedures. Procedures shall be clearly documented, recorded and reported in the mine's safety and health management system in accordance with the MQSHA 1999 Division 3.

Brake Hold Test
Single Drum Winder

- Each set of brakes must be tested independently and hold preferably 200% but at least 150% of the maximum out of balance static torque (MOBT) under all conditions of operation;
- When conducting the brake hold test with the conveyance not in the MOBT position, the brake hold test must still test for preferably 200% but at least 150% of the MOBT.

Double Drum Winder

- Each set of brakes must be tested independently and hold preferably 200% but at least 150% of the maximum out of balance static torque (MOBT) under all conditions of operation;
- The MOBT under all conditions of operations for a double drum winder occurs when a drum is clutched out with the conveyance at the lowest position possible, i.e. near the bottom of the shaft.
- When conducting the brake hold test with the drums clutched in, the brake hold test must still test for preferably 200% but at least 150% of the MOBT.

Friction Winders

- Each set of brakes must be tested independently and hold 200% of the MOBT under all conditions of operation;

All Winders

- Operations must ensure personnel conducting the brake hold test can calculate the MOBT and determine the motor current to be applied to test for the above specified % MOBT when conveyances are at a particular location;
- If the drum moves during the brake hold test, then the brake system is deemed to have failed;
- Each brake hold test shall be conducted in accordance with a site specific procedure and shall be recorded. As a minimum the record shall include:
- Date and time of test;
- Names, position and signatures of personnel conducting the test;
- Location of conveyances during the test;
- Mass of conveyances at the time of the test;
- MOBT under all conditions of operation;
- Motor current applied to obtain the 150%/200% MOBT;
- Motor current/torque applied during the test;
- Outcome of test, i.e. failure or success;
- Actions taken in the event of failure;

Written Confirmation

All metalliferous mines incorporating a winder in their operation shall provide written confirmation to the Mines Inspectorate that their brake hold test is:

- Conducted to test each brake system to 200% MOBT for friction winders and at least 150% of MOBT for drum winders.
- Considered a failure if movement of the drum occurs during the brake hold test.

Hans Sattler
Inspector of Mines
Northern Region

FW Postal MRE - Winder Forum - Cannington.msg

Winder Brake test response.dotx

Queensland Government

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Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	South32 Cannington Proprietary Limited	Inspection	Northern	17/11/2015

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today I visited site for the purpose of conducting inspections and to speak with workers on site. On arrival I completed a visitor's surface and underground induction.

I then met with Mr Steve Hambrecht (Specialist Mining Analysis and Improvement) to discuss the purpose of my visit. Mr Hambrecht explained we were unable to go underground as planned due to the underground supervisor taking a worker to the Cloncurry Hospital.

Mr Hambrecht escorted me tot eh maintenance workshop where I met with Mr Ted Schunemann (Diesel Supervisor). We discussed a recent incident where a worker had walked under the boom of a jumbo.

There had been discussion among the workforce whether this should be classified as an incident with various points of views put forward.

Consultation is defined in the MQSHA as discussion between the SSE or supervisors and affected workers about a matter with the aim of reaching agreement about the matter. Any SWI at a mine should be developed after consultation with workers as they are the one's performing the work and most aware of the hazards.

Any matters workers feel should be dealt with should always be brought to the attention of their supervisor. If workers feel a matter may affect other workers across site or want broader discussion they are able to take it to their site safety and health representative to take to the site safety and health committee.

One of the committee's functions is to facilitate consultation and cooperation between management and workers in initiating, developing and implementing management of risk from operations.

Communication is essential in maintaining and improving safety so I encourage this type of debate to be continued and congratulate Mr Schunemann for doing so.

Mr Hambrecht and I then walked through the workshop to speak with workers regarding safety and health. While doing so I noted a critical compliance report on the meeting board that Mr Hambrecht advised was sent out daily.

Following the inspection Mr Hambrecht printed out some recent critical compliance reports for me to go through.

Mr Hambrecht then introduced me to Mr Tim Le Levre (Mining engineer) who escorted us underground. We first visited the crusher area where a vent bag had been installed and ventilation improved from a previous inspection.

We then went to 570 ladder way and Mr Hambrecht and I climbed the first section of ladder to see the rust that had caused the area to be a *NO TRAVELLING UNLESS AUTHORISED* area.

The rust was on the cage above the ladder way and not the ladder or platform which meant it was fit for purpose and able to be used in an emergency.

Mr Le Levre took us to several levels where we spoke with workers regarding safety and health and we then returned to the surface.

I had a brief close out meeting with Mr Peter Sharpe SSE and told him that there were no safety issues raised at the time and all workers I spoke to felt that if they had a safety issue they could raise it with their supervisor and it would be dealt with.

If workers are happy this is occurring and the processes in place are working the site should be congratulated. I did mention to Mr Sharpe I had several suggestions to make that site could either use, adapt or disregard and he encouraged me to provide feedback.

These are made in the name of improving safety and health without a full knowledge of the processes on site but aimed at improving communication and worker's knowledge.

1/ As part of the structural integrity program an inspection of the water distribution area in the processing area showed surface rust on beams below the walkway at Pb Tails Thickener.

Is there any evidence workers have reported this and if so what action was taken. If workers have not reported it, is this an opportunity to show them what to look for to assist in the identification of suspect structures?

2/ There was also an inspection of the load out system in regard to corrosion or deformation/movement. This indicated there was already a sign up warning people of the structural integrity issue of some steel beams and that they should take "extra care" when entering the area.

What is "extra care?" The term implies the risk is higher than normal so what should a worker be doing that is different to what they normally do?

The area is part of an ongoing structural integrity work program so there is no further action required at this stage as a plan is in place to fix the beams. Some cross beams are noted to be in a really bad state and if they are not required to be replaced they need to be removed or they can fall onto someone falling below.

Questions to be asked are; what is the plan for removal/replacement? What danger are workers in while the anticipated date for removal/replacement arrives?

3/ An inspection noted four clips removed from a section of grid mesh.

This has been rectified but the question to ask is why were they removed? The control has been put back in place but if the clips create a hazard then the situation (of clips being removed) may arise again.

4/ Wireline and winch ropes will not be replaced within the 12 month recommended (not mandatory) period. The period is to be extended by 47 days because the ropes have not been exposed to salt or salty environments and will only be used to 40-50 percent of their rated load capacity.

A question to be asked is what process is in place to ensure the ropes are only used to 40-50 percent of their rated load capacity? Also what is the process if drilling continues beyond 17/12/15?

5/ Are maintenance personnel trained on how to repair and maintain individual types of equipment? If a new fitter comes in for example are they expected to know about particular equipment because they have a ticket or is the owner's manual sufficient (and available) for them to gather the appropriate knowledge?

An operator may have a ticket but they will be taken through a familiarisation of a different model before being allowed to operate. Is there a process like this for fitters?

6/ If a fitter does not have a full ticket to operate a machine is there a partial ticket that allows them to move it into and out of the workshop and to operate to test?

7/ The use of scaffolding by fitters working on mobile equipment may improve safety and efficiency. A ticket is not required to erect a scaffold 4 metres or less but is there another option.

I recommend the crew be encouraged to come up with ideas. An example could be an engineered platform able to be moved by the overhead crane.

During the close out meeting with Mr Sharpe I made mention of section 195 of the MQSHA that required an inspector and a District Workers Representative to be informed of a serious accident, high potential incident or fatality and left site.

James Coghlan
District Workers' Representative
Northern Region

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	South32 Cannington Proprietary Limited	Inspection	Northern	07/07/2015

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today I visited site for the purpose of an inspection of the remote loader system and the investigation of an uncontrolled movement of a loader. On arrival Mr Hans Sattler (Inspector of Mines-Mechanical) and I completed a visitor's induction.

We then proceeded to site were we met with Mr Adam Bamford (Maintenance Analysis and Improvement Superintendent). We discussed the purpose of our visit and also met with Mr Glen Loveday (Maintenance Manager).

Mr Bamford introduced me to Mr Shane Johnson (Haulage Superintendent) who took me into the remote operator's room. Mr Bamford and Mr Sattler left to complete an inspection of the mobile plant.

I was introduced to several operators in the room and observed them operating and asked questions. Each loader underground has a unique ID and this is matched to a control box in the remote operator's room. This control box can be connected at any of the operating stations.

There is a teleremote checklist which is completed each shift prior to the remote loader operating. The remote operator usually completes this but if another suitably qualified operator is underground they may complete it. The checklist is left at the TLC outside the remote loader area.

One of the tests performed in the prestart is a check on the laser barricade shutting down the engine. This barricade must be reset after tripping manually; first at the laser itself and then the TLC.

Paperwork for each stope is left in the remote loader room which is very detailed. I did note that in the two I looked at the location of the laser barricade was not noted in the box provided however it was noted and highlighted on the plan.

On leaving the room I met with Mr Grant Egginton (Mine Manager) to discuss the purpose of my trip. I was invited to a weekly sustainability meeting and during this meeting I noted an incident where the refuelling alarm had been bypassed. I remind all workers bypassing any control is a breach of their obligations. s36MQSHA

On reuniting with Mr Sattler and Mr Bamford I asked Mr Bamford several questions in regards to the investigation of an incident involving LD123 as he was part of the investigation team. I had only an incident report and not all of the information the investigation team was party to.

It is noted on page 2 under the Incident Investigation heading that at the start of the investigation process numerous hypothesis were identified. Each was tested through visual inspections, electrical functional tests or data logging during operation and through that process the first four scenarios were removed as possibilities.

In most cases facts are collected prior to forming hypothesis so as not to dismiss any findings and ensure the investigation looks at all possibilities. In this case were the hypothesis formed prior to collecting data or after it had been collected?

A graph is included showing information captured by the second data logger placed on the machine after the incident. This shows that in a 12 minute period the loader speed was recorded at over 20km/h.

This information was gathered after the incident which begs the question; how long was the ground speed sensor returning faulty readings for?

One of the actions from the investigation is to create a maintenance strategy for the ground speed sensor; either via a fixed time change out or a test.

The data logger showed this information but was applied after the incident and gathered the information after the incident. This was done in reaction to the incident but to be proactive and prevent it happening again can a data logger capture this information and either issue a warning or indicate the equipment should be changed out?

I also observed that the operators do not see the dials in the loader as they would if they were operating manually. Would this ability assist the operators to identify issues with the loader?

On completion of our close out meeting with Mr Bamford Mr Sattler and I left site.

James Coghlan
District Workers' Representative
Northern Region

Queensland Government

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P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Cannington Pty Ltd	Inspection	Northern	04/03/2015

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today I visited site with Mr Deon Esterhuizen (Inspector of Mines) for a ventilation audit. The bulk of our visit is covered in Mr Esterhuizen's Mine Record Entry. On arrival Mr Esterhuizen and I completed visitor inductions (surface and underground).

We then drove to site where we were met by Mr Grant Eggington (Mine Manager). Mr Eggington introduced us to our host Mr Frikkie Sadie (Scheduling Engineer), Ms Jessica Black (Ventilation Engineer) and Ms Eloise McMahon (Ventilation Engineer) then left us.

We held a meeting to introduce ourselves and explain the purpose of our visit.

Ms Black explained how she and Ms McMahon visited crew meetings to answer questions and maintain the line of communication with the workers. Ms Black also explained that she had developed a presentation on ventilation awareness that was presented to crews.

Ms Black took us through the presentation and answered our questions and also presented us with a bow tie analysis for *exposure to an irrespirable atmosphere*. Training in ventilation and fumes to underground crews was one of the controls listed in the bow tie analysis.

Ms Black explained ventilation awareness was included in the underground core induction and that supervisor's competency included the competency to identify irrespirable atmosphere.

Past conversations with workers new to underground has indicated that they have limited idea of ventilation after leaving inductions. After seeing ventilation and experiencing it in the underground environment they have a better understanding.

I suggested the topic of ventilation awareness somehow be revisited after workers had worked underground for a short time.

Workers do not have equipment to measure airflow which, if it drops below 0.5m/s, constitutes an unventilated area. The presentation presented information that told workers that airflow is generally expected to drop below 0.5m/s approximately 20 metres from the end of the vent bag.

This, from a worker's perspective, is a default setting and any work conducted beyond 20 metres should be considered unventilated until proven otherwise. This proof can come by way

of a supervisor testing with the appropriate instrument or a practical test by the worker.

This practical test is explained in the presentation but if at any time a worker is unsure they should stop the job and request a supervisor to take a reading. If the worker proceeds they should make a note in their Take 5.

Air flow may drop below the required 0.5m/s within that 20 metre zone so workers should constantly monitor ventilation and if unsure stop the job and request a supervisor to take a reading. This should also be noted in their Take 5.

Mr Sadie explained that procedures in place ensured no heading being worked at was further than 20 metres from the nearest ventilation source.

I recommended to Ms Black that even though workers do not have Kestrels to monitor ventilation they should be shown how they work during the presentation.

Drop board regulators (DBR's) were also described in the presentation and workers encouraged to report any where the number of boards were incorrect. I recommend that workers be encouraged to report these even if they are able to correct them.

Ms Black and Ms McMahon escorted Mr Esterhuizen and I underground to visit various locations associated with ventilation. The majority of this inspection can be found in Mr Esterhuizen's Mine Record Entry.

There was however an area of concern at the crusher. There appeared to be a covering of dust in the area and very little ventilation. There is ventilation running though at the bottom of the crusher area but this does not flow up to the crusher area.

We were able to speak to a crusher operator who confirmed that he left his office into this environment when the crusher was operating 5-10 times per hour. He also confirmed there had been a fan in the crusher area but that it had not worked since he had been there.

Further questioning resulted in the belief the fan had not operated since the RAR had been relocated. I am unaware of Mr Esterhuizen's findings at this time but I recommend that this situation be looked into and rectified as it is not as low as reasonably achievable.

On completion of our visit we were joined by Mr Phil Casey (District Inspector of Mines) and held a close out meeting with Mr Eggington, Ms Black, Ms McMahon and Mr Sadie; again this discussion will be contained in Mr Esterhuizen's Mine Record Entry.

James Coghlan
District Workers' Representative
Northern Region

Queensland Government

Mount Isa District Office
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Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Cannington Pty Ltd	Inspection	Northern	18/02/2015

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today I visited site for the purpose of an underground inspection and to talk with workers. On arrival I completed visitor's induction for surface and underground and then met with Ms Danielle Kyle, Mining Assistant.

Ms Kyle introduced me to Mr Dennis Ogden, Superintendent who informed me of what he had arranged for me to conduct my inspection. Ms Kyle then introduced me to Mr Grant Eggington, Mine Manager who I spoke with in regard to the purpose of my visit.

I then met with Mr Rick Burdett, Production Supervisor who escorted me underground. We first visited a donga set up as a cribroom at 240 level. This cribroom could seat four people but it was very tight and crowded.

I was informed the cribroom was set up for truck drivers but between 6-20 people use the cribroom at various times. If this is the case I recommend a larger cribroom be established.

The donga sits on a concreted cuddy and one suggestion from workers was to close off the cuddy and set the cribroom up the same as those at 450 and 575.

I visited both these cribrooms and they were neat and tidy and well supplied. While at all cribrooms I spoke with numerous workers regarding safety and health. I also spoke with numerous workers on the job regarding safety and health. No issues were raised at this time.

I did however raise a couple of concerns with workers. Form speaking with several workers when a job sheet is handed to them the procedure is attached to it. The first was in regard to ensuring workers note any changes to a procedure and feed this back to supervisors.

I also noted in a drilling machine's pre-start book that a stinger had been unsafe since the first day of the pre-start book which was 8-1-15; meaning the issue may have been noted earlier. I was told the wrong part had been ordered and this is why the issue had dragged on.

The operator assured me that the issue was an inconvenience and the machine could still be operated safely.

On completion of my inspection Mr Burdett escorted me back to the surface and as Mr

Eggington was unavailable I left site.

James Coghlan
District Workers'
Representative
Northern Region

Queensland Government

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Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	24/09/2014

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today I visited site for the purpose of an inspection of emergency procedures and equipment. On arrival I was met by Ms Rhonda Greensill, Assistant Cannington Operations who kitted me out for underground.

I was escorted underground by Mr Mark Scott, Development Supervisor to various levels and locations. We inspected an ERB on 175 Level Southern Zone and ladderways at 193mLv and 400mLv.

Mr Scott explained how Safety Reps from each crew conducted level inspections monthly. These level inspections included the ERBs and ladderways with the reps climbing the ladderways between levels to inspect them.

I asked Mr Scott if workers were required to climb the ladderways as part of the induction and he replied he thought that was not the case but could not be sure.

While underground I noted trucks and water carts had stationary green lights. Emergency vehicles have flashing green lights so I asked if this had been considered in the risk assessment to decide to install stationary green lights.

On returning to the surface Mr Scott showed me the meeting rooms and communication boards in each. There were sheets titled *Safety Tracker* which are used to capture hazards in their pre-shift meetings.

There is however no place for putting what to do about it, who is responsible and by when. The same form for diesel maintenance had this information. Mr Scott felt it may have been an education issue as the process was still new but any hazard raised should have an action associated with it; whether it is corrective or investigative.

I spoke with the Medical Centre Nurse regarding her role in an emergency and found that in a fire everybody evacuated to the assembly point. In an emergency where the first aid room was not affected she felt it would be better if she could stay where she was as the room was set up to handle any injuries rather than doing so out of the back of the ambulance.

I also asked whether she was kept informed when the ERT attended an accident scene. It appeared the nurse did not know the extent of injuries until the patient was brought into the

first aid room.

I recommend a review of the duty cards to see if a step needs to be added to contact the nurse in case of fire or injury so that she can, in the case of a fire, remain or evacuate and if the ERT is called out she is informed early as to the possible injury/injuries she may have to treat.

I met with Mr Adam Self, Emergency Response Coordinator to discuss the emergency rescue team and emergency response. He explained the use of “whisper” to alert ERT personnel in an emergency. We also discussed the training and level of expertise of each crew.

Mr Self showed the level of competence of each crew and how this determines the training that crew completes on their quarterly three-day training block.

I mentioned the possibility of workers being forced to climb up ladders located in a return air raise running out of their self-rescuer. Mr Self informed me there had been a risk assessment done and no worker underground was further then 750 metres from an ERB anywhere in the mine.

When a worker is required to work further than 750 metres from fresh air the mining procedure includes the controls of a barricade, permission to work beyond the barricade and a second self-rescuer.

I asked whether workers were required to climb the ladderway as part of the underground induction. From the people I asked it appeared this was not a requirement.

I recommend this be included as a part of the underground induction as s99 of the MQSHR states a Supervisor must ensure a person does not enter the workplace unless they reasonably believe the person is capable of responding appropriately to any incident or emergency.

I then met with Mr Darren Reid, Planning Superintendent Maintenance and inspected the diesel workshop and boilermaker workshop.

I inspected several first aid kits mounted on the workshop’s walls and found they had depleted stores and no inventory sheets. The Australia Standard for first aid kits states that each first aid kit shall contain a list of contents and clearly printed instructions to immediately replace expended contents.

Not long after I inspected the Redpath workshop and found their first aid kits to have a list of contents in place. I recommend an audit of first aid kits on site be conducted to ensure all kits have the list of contents and that the contents are in place.

If regular inspections have been conducted then the question should be asked as to what was being checked and why the depleted contents were not rectified.

I then met with Mr John Wright, Fixed Plant Supervisor who escorted me to the Redpath workshop, tyre repair workshop and the winder. At the tyre repair workshop being used by the boilermakers we found a screen and hoses blocking and creating a tripping hazard in front of an emergency eyewash.

Mr Wright spoke to the boilermaker present and when we returned an hour later the boilermaker had cleared the area and informed fellow workers of the hazard.

Mr Wright gave me a thorough instruction on the winder which was clean and in good working order. The only issue found was an emergency eye wash at the base of the stairs with no

water pressure.

There was a portable eye wash nearby but Mr Wright agreed there should at least be an out of service tag on the eye wash to inform workers it was not working and directing them to the portable one.

During my visit there were several emergency eye wash extinguishers which were hung on walls with no green light. The question of the site standard for emergency eye washes could not be answered.

If the site standard states green lights are to accompany emergency eye wash extinguishers then they need to be put in place.

James Coghlan
District Workers' Representative
Northern Region

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	25/09/2014

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

Today I visited site for the purpose of an inspection of emergency procedures and equipment for the process area. I was escorted by Mr Michael Sganzerla, Superintendent.

During my visit we found a fire hose on CV4 with the end cut off. Mr Sganzerla made note of it to be repaired immediately. The area was in good order in readiness for an outage.

At the Aluminium Sulphate Tank I noticed a sign for the required PPE when entering the area was cable tied to the hand rail going down into it. On an adjacent tank the sign hung on a swing gate. Mr Sganzerla agreed it would be more effective to install a swing gate with the sign and took note to do so.

I also visited the lab and found it clean and organised with procedures in place for all hazardous chemicals used.

James Coghlan
District Workers' Representative
Northern Region

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	21/05/2014

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today I visited site for the purpose of inspecting the maintenance workshop and speaking with workers in the area. On arrival I was met by Ms Rhonda Greensill, Administration Officer and supplied with site clothing.

I was introduced to Mr Glen Loveday, Manager Maintenance and Mr Laurie Mitchell, Mobile Supervisor and discussed the purpose of my visit. Mr Mitchell then accompanied me to the maintenance workshop.

I inspected the workshop area, safety boards and had discussions with several diesel fitters and electricians regarding safety. Mr Mitchell then escorted me back to the administration building where I completed an underground visitor's induction.

On completion of the underground visitor's induction I met with Mr Charles Buchanan, HSEC Manager and requested a copy of a mine record entry for a trial evacuation.

Before leaving site I had a close out meeting with Mr Troy Wilson, Site Senior Executive. We discussed an issue raised by maintenance workers in regards to tagging and isolation.

The process in place stated once more than four workers tagged on to an isolated piece of equipment a permit was required. This inhibited the ability of workers underground to perform their jobs in an efficient manner.

Mr Wilson agreed with their concerns and felt safety and production could both be enhanced by a change in the process. He informed me he would approach the appropriate people to discuss the issue.

James Coghlan
District Workers' Representative
Northern Region

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	22/05/2014

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today I visited site for the purpose of an underground induction. I was escorted underground by Mr Mick Casey, Permit Issuer and Mr Mick Benson, Mine Training Supervisor for the purpose of inspecting emergency facilities underground.

We inspected an ERB on 240 level and ladder way at 450 Level. Mr Casey and Mr Benson answered all my questions regarding emergency rescue facilities and processes and produced the relevant documentation.

On returning to the surface I spent time in PITRam where I asked questions regarding emergency response procedures. I discussed several questions I had from the information gathered with Mr Troy Wilson, General Manager in our close out meeting.

James Coghlan
District Workers' Representative
Northern Region

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	06/01/2014

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Site Safety & Health Reps Consulted: Alistair McAdam

Today (6 January, 2014) I visited site for the purpose of inspecting Conveyor Number 4 and underground ERBs.

I drove to site from Mount Isa and on arrival signed in as a visitor at the village. I then drove to the mine and was met by Ms Danielle Kyle, Assistant Underground Operations who arranged clothing for me.

I met with Mr Spencer Clark, Superintendent Surface maintenance who escorted me to CV04. We were met by Mr Mick Lee, Supervisor Surface Mechanical and proceeded to the head drum of CV04 where a spray bar had been installed.

Workers had raised concerns of the dust coming of this conveyor and several solutions were looked at. The original design included a spray bar but it had deteriorated and been removed.

I spoke with Mr Alistair McAdam, Operator who told me the workers in the area were happy with the solution and that dust from CV04 was now not an issue.

I found a Fire Extinguisher on the same level as CV04 covered in dust with the sign also hidden by dust. I pointed this out to Mr Clark and he told me he would speak with the contracting company who serviced the fire equipment as to why or how it was missed.

The contracting company has a list but I recommend they also be given a diagram of the area which shows the equipment location. Such a diagram was located outside the underground crew's meeting rooms.

I was then introduced to Mr Steve Hambrecht, Superintendent HSEC who escorted me to the Medical Clinic and introduced me to Ms Claire Langton, Clinical Nurse.

We discussed several issues including which external emergency service is contacted in an

emergency and first aid training.

Today (7 January, 2014) I was escorted underground by Mr Jason Thain, Superintendent Process Control and Improvement and Mr Michael Casey, Permit Issuer.

We travelled underground and stopped to inspect an ERB. In my previous Mine Record Entry I asked how the kits where checked to ensure perishable items were in date as I had noted the information tag on the First Aid kit was five years old.

Mr Hambrecht had informed me the previous day that eye wash had been removed from the kit and placed in boxes in the ERB. This allowed the safety reps to check the use by date on their weekly inspections.

Mr Hambrecht also explained how the kits are now sealed and the safety reps check the seal to make sure it has not been broken. The information tag attached to the kit was dater 2008.

I enquired why a new information tag was not placed on the kit after each inspection and Mr Thain and Mr Casey aid they would look into why this was not done.

I was then introduced to Mr Rod Tonkin, Operator and sat in his passenger seat on a circuit off loading and tipping. During this circuit I observed the proximity detection system and asked Mr Tonkin several questions regarding it.

On return to Mr Thain and Mr Casey we discussed the proximity detection system and Mr Thain explained there had been a lot of work put into it and it was still a work in progress.

We travelled to a diamond drill site where I spoke with Swick diamond drillers Josh Lerch and Luke Aldridge. During this discussion I learned of a motorised shaker that Swick had developed for getting core samples out of drill rods.

We also discussed the ground they were working on. The drill is being moved along a drive so concrete is not a viable option to create a level surface to work on. Mr Thain explained how the drill had stabilisers so concrete was not needed as it could be levelled using these.

Mr Casey and I discussed with the operators the idea of laying (conveyor) rubber after the ground had been levelled to provide comfort for workers and also a level ground to work on.

We then travelled to 400 level store where we inspected the vent store which was barricaded off due to the North stope ore pass being too close to it. Possible solutions were being looked at to fix the issue before this section could be reopened.

We returned to the surface and as Mr Troy Wilson, Site Senior Executive was in a meeting I left site to return to Mount Isa.

James Coghlan
District Workers' Representative
Northern Region

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	07/08/2013

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Site Safety & Health Reps Consulted: Ron Palmer
Andy Bell

Today I attended Cannington Mine for the purpose of a familiarisation visit. Upon arrival yesterday afternoon I was met by Ms Joanne Kent, Specialist, Communities Execution who showed me around the village and arranged my accommodation.

Today Ms Kent accompanied Mr Mark Desira, Senior Principal Occupational Hygienist and I to site where we attended a surface induction. Upon completion of the induction Mr Desira and I were given access to a room to conduct interviews.

Mr Desira and I spoke with Mr Rod Gilliland, Specialist Safety Execution and Mr Ron Palmer, Driller in regards to Mr Palmer's role as a Site Safety and Health Representative. During the meeting communication between the fly in/fly out Site Safety and Health Representatives was identified as an issue.

Possible solutions thrown up were the availability of minutes to all parties, conference calls and a suggestion that discretionary training days be utilised to bring all Site Safety and Health Representatives together twice a year.

Mr Desira and I then spoke with Mr Palmer and Mr Andy Bell, Site Safety and Health Representative about several subjects, none of which require further follow up at this time.

I was then accompanied by Mr Gilliland to Mine Control/Pitram where I was left with Mine Control/Pitram Operators Mr Peter Beard and Ms Jenny Johnson. The role Mine Control/Pitram plays in the mine's operation was explained to me as were some of the processes used.

Mr Palmer then took me on a visit underground where we stopped at an Emergency Refuge Bay, cribroom and diesel workshop. The cribroom was well set up with computers available for workers to access information, including procedures and standard work instructions.

The diesel workshop was neat and tidy and I spoke with several workers. No safety issues were raised.

The ERB contained a knapsack identified by Mr Palmer as a First Aid kit with an information tag dated 2008. Mr Palmer informed me that regular ERB inspections are undertaken.

On our return to the surface I accompanied Mr Palmer to a shift safety meeting where several issues were raised and solutions found within the personnel present. I was told minutes of these meetings were given to each crew but a concern raised by several crew members was that items were removed when one crew decided the issue had been resolved.

Workers felt the item should only be removed when the crew who raised the issue felt it had been dealt with satisfactorily. The workers indicated this was something all crews were working towards.

Section 40 (1) of the Mining and Quarrying Safety and Health Regulation 2001 states the SSE must ensure the mine's emergency response facilities and equipment are inspected regularly and maintained in a fully operational condition.

I found no evidence showing the First Aid kit in the ERB I visited had been regularly inspected to ensure it was maintained in a fully operational condition as per the above section.

I recommend a process be put in place where First Aid kits in ERBs are inspected and appropriately tagged. The First Aid Code of Practice for Queensland is a good resource in this area.

Please advise if there is a process in place for the inspection and restocking of First Aid kits in ERBs and provide criteria for same.

James Coghlan
District Workers' Representative
Northern Region

Mine Record Entry Response - Cannington Mine.msg

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	South32 Cannington Proprietary Limited	Inspection - Unannounced	Northern	11/08/2015

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today I visited site for the purposes of an Inspection. On arrival I completed the visitors underground and surface induction.

I completed a visual inspection of the following areas of the Cannington Village.

- Laundry
- "Sapphire" block 18
- Gymnasium
- Kiosk Substation 2
- Village Substation including Kiosk 1 and 4.

I found the electrical installation to be well maintained. Flexible electrical leads and RCD's to be in test date. I later confirmed with Mr Stuart KING that the RCD test records did relate to injection testing of RCD's.

I observed the Village Sub Station perimeter fence to be unlocked and open for a period of time with no persons present. The gate was locked once the Village maintenance staff were notified.

I observed access to one switchboard in the Gym to be obstructed by the "exercise ball" storage rack. I would recommend that access to this switchboard not be obstructed.

Jon Smith
Inspector of Mines
Northern Region

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	South32 Cannington Proprietary Limited	Inspection	Northern	12/08/2015

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today I visited site for the purposes of an Inspection. I had completed the visitor's underground and surface induction on 11-8-2015.

On arrival I met Mr Grant EGGINTON (Manager Underground Mining); Mr Glen LOVEDAY (Manager Maintenance) and Peter SHARPE (Asset President and SSE). I explained the purpose of my visit as being to meet the relevant persons at Cannington Mine, obtain an overview of the site, an overview of the electrical installation and distribution; and discuss the outcomes of the investigation into LDW 123 uncontrolled movement.

I then took up with Mr LOVEDAY who gave me an overview of the Cannington Mine operations and then took me to meet Mr Adam BAMFORD (Maintenance A&I Superintendent). Mr BAMFORD was the investigation Team leader for the investigation into LDW 123 uncontrolled movement. I then took up with Mr BAMFORD. Mr BAMFORD explained the investigation – methodology; data; how the data was analysed; what the corrective measures were as a result of this incident and how the corrective measures related to the incident. Mr BAMFORD also clarified any perceived inconsistencies that I had seen in relation to the data on this incident. Mr BAMFORD explained how the corrective measure that related to a maintenance function was to be implemented.

Mr BAMFORD then took me to meet Mr Shane JOHNSON (Haulage Superintendent). I then took up with Mr JOHNSON. Upon request Mr Johnson could demonstrate how the corrective measures identified from the investigation had been introduced into the standard work instruction for the teleremote loader operations. Mr JOHNSON also took me to and explained the teleremote surface control station.

Mr LOVEDAY then took me to meet Mr Stuart KING (Superintendent Fixed Plant Maintenance). Mr KING then gave me an overview of the electrical distribution system. I then took up with Mr KING and Mr LOVEDAY. Mr KING took me to observe the electrical repair work being conducted on the 11KV – 3.3 KV transformer supplying the ventilation Fan. I met Mr Rohan GILBERT (Electrical Supervisor and PTCEW). I had a discussion on the sites HVIA process and observed the switching sheet and access permit for this task. I then inspected the Ventilation Fan HV and LV switch room. I had a discussion with Mr KING over a "Power Model" study being conducted for the site which also included an arc flash study component.

I then left site for the Cannington Village and departed the Cannington Village AM on 13-8-2015.

Jon Smith
Inspector of Mines
Northern Region

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	17/04/2014

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today I attended site to discuss the recent relative increase in underground high potential rockfall incidents of which there have been eight in the last six months.

An overview of the site's Geotechnical Management systems was provided by Mr Hendrick Esterhuizen, Geosciences Superintendent also present was Christina Rurak, Geotechnical Engineer, Kate Williams Senior Geotechnical Engineer, Jianping Li Principal Geotechnical Engineer, Harpreet Singh Mine Graduate Geotechnical Engineer and Sam Robotham, Geotechnical Engineer.

The following points are noted from the discussion:

- The site has developed a rockfall risk management flowchart which includes back analysis and review of rockfalls

- The key areas in the risk management process include risk mitigation, quality assurance and quality control, monitoring, ground support designs, stable mine designs and hazard mapping and inspections.

The following points are noted from the inspection:

- The oldest development underground would be approximately 17 years old, all non-access restricted development has installed ground support.

- Mr Esterhuizen said the operation is committed to check scaling all areas of underground development once per annum. This commitment is likely to require dedicated resources and thorough record keeping. A discussion was held on the hazards associated with hand scaling out of a basket where it may be more difficult to hear the sound of the ground with a machine on the in the background, you may not always have a good egress out of the way of falling rocks because you are confined to the basket and you may not always get your preferred bar angle under a rock because you are in a basket, thus hand scaling from a basket requires good risk management as it can be hazardous. It was also discussed that no hand

scaling would be under taken on cracked shotcreted ground and that the scaling crews would have the experience and knowledge to know when a scaling job requires mechanical scaling not hand scaling .

- Mr Esterhuizen said cracked shotcrete is not shotcreted alone over the top, it is either mechanically scaled and / or meshed and shotrcreted.

- Geotechnical personnel conduct annual hazard mapping of each level which includes pedestrian access audits and infrastructure audits. The infrastructure audits includes some development / access drives around the infrastructure. After a discussion with the geotechnical personnel on site I was confident that all areas of development with unrestricted access had a ground condition inspection as per the determined required frequency

- The recording of rehabilitation requirements and co-ordination with the development of hazard maps did appear onerous. There are several hazard maps for different features of the ground (eg. water, ground support, damage etc)

- There appeared to be somewhat overlapping systems of inspections – the infrastructure inspections, the pedestrian access inspections, the level hazard map inspections, routine inspections, rehabilitation audits and the scaling crew inspections.

- It may be a benefit to simplify the rehab inspection register (there was some rehab first identified in 2011) and while there was valid reasons older jobs were still on the list, the reasons were better described in person that from the information on the sheet.

- There should be a time limit set for how long a rehab plan is valid from its design date, as ground conditions change over time and may change rapidly if close to production etc

- Jianping Li's MAP3D modelling work compares well with Itasca's FLAC3D modelling and over the last 6 years has compared well with what is seen underground. It can therefore be said this modelling has driven effective stope design and sequencing and thus maximised ground stability. The modelling has also provided a high level of confidence in the extent of the conveyor incline mining exclusion zones.

- Seismic monitoring is undertaken

- An external review was conducted by Ernesto Villaescusa in 2013.

Summary of key points:

- The high potential incident rock falls over the last six months are not related in terms of any major changes in ground conditions underground or in terms of changes to any mining practices.

- The site has made a commitment to scale all (readily accessible) development at least once annually and is reviewing the management of check scaling

- Hand scaling out of a basket is hazardous

- The site is reviewing the frequency of inspections

- A variety of underground ground condition / geotechnical type inspections occur, there may be some benefit consolidating how they are all recorded

- Rehabilitation requirements appear to be well known and there is not an unreasonable amount of outstanding rehab required

- The site's geotechnical staff are competent and appear to be dedicated and understand their responsibilities.

Katie Ormonde
Inspector of Mines
Northern Region

Cannington reported HPI rockfalls in the last 6 months.docx

Queensland Government

Townsville Office
P.O. Box 1752, TOWNSVILLE QLD 4810
Phone: (07) 44479249, Fax: (07) 44479280

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	05/11/2014

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today, I attend the site to familiarise myself with the underground materials handling and hoisting system. Upon completing a visitors induction, I met Mr Grant Aitchison (Underground Manager) who briefed me on the status of the materials handling and hoisting system, that were inoperative due to maintenance shutdown being carried out at the time of my inspection.

Mr Aitchison then introduced me to Mr Joseph Russell (Production Superintendent) and Mr Vince DeCarolis (Site Senior Executive.SSE)

Mr Aitchison and Mr Russell then escorted me to the underground material handling systems, where I inspected the following areas;

- Crusher station (I observed that a plate feeder hydraulic powerpack unit, next to the crusher, contained oil from a previous leak at some point, that required to be cleaned up.)
- Loading Station / Tipple area
- Transfer conveyor belt systems

After the underground inspections and familiarisation of the various underground areas, we returned to the office where I met Mr Glen Loveday (Maintenance Manager) and Stuart King (Maintenance Superintendent) and discussed maintenance schedules and current fixed plant maintenance activities.

Following our meeting, Mr King escorted the SSE and myself to inspect the hoisting system headframe and the tower mounted Friction Winder.

Upon arrival at the shaft area,I observed that there were some rock spillage evident around the shaft collar and on walkways of the headframe,which appeared to be coming from the skips when dumping their loads.

We travelled to the top of the headframe via an Alimak Lift and observed the ropes being X-rayed. I met the winder drivers and reviewed their daily pre-start books and electrical and maintenance log books.

Issues discussed and points of concern are:

1. All hydraulic powerpac's to be maintained, and if any oil leakage is evident, for the oil to be cleaned up, as soon as possible (potential fire hazard)
2. Any rock spillage from the skips, must be rectified and the spillage of rocks to be cleaned

from the headframe steelwork and around the shaft collar.(this is potentially hazardous to personnel within and around the shaft area)

3. I requested a copy of the X-ray report relative to the winder rope inspections.

Mr Loveday and Mr King agreed to rectify the above-mentioned items and to forward me the X-ray report on the winder ropes.

After inspection of the headframe and friction winder we returned to the office to have a close out meeting.

Number	Substandard Condition or Practice	Due Date
1	**Rock Spillage**	**24/11/2014**

Evidence of rock spillage around the shaft collar,headframe and skip tipping scrolls.

Review, modify or repair skips to prevent rock spillage down the shaft.

Reference: Mining and Quarrying Safety and Health Regulation 2001. Section 108, 124

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Louis Van Der Merwe
Inspector of Mines
Northern Region

FW 051114 Site Inspection-MRE.msg

Queensland Government

Townsville Office
P.O. Box 1752, TOWNSVILLE QLD 4810
Phone: (07) 44479249, Fax: (07) 44479280

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Louis Van Der Merwe, Inspector of Mines (Metalliferous)

Subject:	**Rocks falling**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	05/11/2014
Record Date:	12/11/2014	**MRE Item No.:**	1

Title: Rock Spillage

Description of Action Required to be Taken:
Evidence of rock spillage around the shaft collar,headframe and skip tipping scrolls.

Review, modify or repair skips to prevent rock spillage down the shaft.

Reference: Mining and Quarrying Safety and Health Regulation 2001. Section 108, 124

References:
Reference: Mining and Quarrying Safety and Health Regulation 2001. Section 108, 124

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 24/11/2014

Completed: 24/11/2014**, Closed by:** Louis Van Der Merwe **on** 10/12/2014 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Queensland Government

Townsville Office
P.O. Box 1752, TOWNSVILLE QLD 4810
Phone: (07) 44479249, Fax: (07) 44479280

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	South32 Cannington Proprietary Limited	Inspection	Northern	05/08/2015

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Mark Desira

Queensland Government

Townsville Office
P.O. Box 1752, TOWNSVILLE QLD 4810
Phone: (07) 44479249, Fax: (07) 44479280

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	South32 Cannington Proprietary Limited	Inspection	Northern	05/08/2015

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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On 5-Aug-2015, Mr Jack Farry (Senior Inspector of Mines - Occupational Hygiene) and I conducted an inspection of Cannington Mine.

The purpose of the inspection visit was to assess the application and to promote awareness of the recently issued guidance notes *QGN 21 -Guidance note for management of diesel engine exhaust in metalliferous mines* and *QGN22 - Guidance note for management of noise in mines* . The scope of the inspection included documentation relevant to the risk management of diesel engine exhaust and excessive noise as well as a physical inspection of underground mine areas.

On arrival at the site, Mr Farry and I met with Andrew Gaggiano (Occupational Hygienist) were escorted to meet Glen Loveday (Maintenance Manager) who is acting as site senior executive (SSE) to discuss the scope of our inspection and logistics.

Underground Mine Inspection

Shane Johnson (Superintendent Haulage) and Mark Lopeman (Shift Supervisor) escorted Mr Farry and I on an underground inspection.

We first went to 280 mLv to observe a Shotcreting operation. Mr Johnson said that the mine has made engineering modifications that allow both workers (agi operator and shotcreter) to control the whole of the spraying phase from within their air-conditioned vehicle cabs. The worksite was a heading directly off the decline and was not directly ventilated. Mr Johnson stated that ventilation to the area was being supplied directly from the decline because shotcreting operations were occurring only a few metres from the entrance to the drive. We discussed the ventilation demand of shotcreting with Mr Johnson who stated that the challenge was to get the correct balance of sufficient ventilation without excessive airflow that would interfere with the shotcreting. During the spraying phase, Mr Farry measured the Wet Bulb Temperature (WB) at an area close to the Agi truck discharge chute; the WB was 19.1 ˚C. The sound pressure level (SPL) at the same point was 83.6 dB(A) during the spraying phase.

At the 175 mLv, an enclosed cabin jumbo was drilling the face with two workers present. The area was effectively ventilated with the ventilation bag approximately three metres to the rear of the jumbo and discharging towards the working face. A spot check at the position of the jumbo offsider using the Kestrel meter indicated that the WB was 17.1 ˚C. A noise level in the

jumbo cab during the drilling operation was 79 dB(A).

We then travelled to the underground maintenance workshop on the 450 Level. Good housekeeping was observed in the workshop. Mr Johnson notified us that the ventilation in the workshop had been recently improved by installation of additional ducting to more effectively remove exhaust gases. A spot check in the workshop using the Kestrel meter indicated that the WB was 17.4 ˚C.

In general, the housekeeping standard and roadways in the parts of the mine where we travelled were observed to be well prepared and maintained.

After the underground inspection, we met with Laurie Mitchell (Supervisor mobile plant). Mr Mitchell gave us an overview of the diesel particulate matter (DPM) reduction projects. Some of the projects have been undertaken with contribution from Caterpillar, the original equipment manufacturer (OEM). A significant reduction in workers' DPM exposure has been achieved through the combination of an increased preventative maintenance program, application of the Cat VR package and exhaust filtration systems to underground heavy vehicle plant. Mr Mitchell stated that the projects have achieved an average of reduction of approximately 80% of the DPM. Mr Mitchell stated that specifications had been developed for all mobile plant that specified engines that meet a minimum a Tier 3 engine or emissions equivalent to a Tier 3 engine. We sighted plant specifications for a Normet Truck and Caterpillar AD60 Truck as examples as well as the Diesel Emissions Management Plan.

We then met with Mr Gaggiano to view the occupational hygiene monitoring data for the mine. At present the mine reports that all Similar Exposure Groups (SEGs) for DPM are below the exposure limit of 0.1 mg/m^3 .

Mr Gaggiano also demonstrated the 3M ear fit validation system. Using this system, the occupational hygienist is able to measure the noise level between the ear plug and the worker's ear drum to evaluate the effectiveness of hearing protection that the worker receives. The worker is able to adjust or refit the pug to determine the best fit. This system is used in conjunction with the mine's hearing conservation program.

The mine also uses a portacount system to evaluate the facial fit of respiratory protection for a worker.

Mr Gaggiano also verified that vehicle specifications for the Normet and Caterpillar AD60 Truck also included specifications for noise emissions and sound levels in vehicle cabins.

Closing Meeting

Prior to leaving the mine, Mr Farry and I met with Mr Loveday and Mr Gaggiano to discuss our observations and findings.

Mark Desira
Senior Principal Occupational Hygienist
Northern Region

Jack Farry
Inspector of Mines
(Occupational Health)
Southern Region

Queensland Government

Townsville Office
P.O. Box 1752, TOWNSVILLE QLD 4810
Phone: (07) 44479249, Fax: (07) 44479280

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	South32 Cannington Proprietary Limited	Inspection	Northern	26/05/2015

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

On 26-May-2015, I conducted an inspection of Cannington mine focussing on lead (Pb) risk management.

After a visitor's induction, I had a meeting with Peter Sharpe (Asset President and site senior executive) and Andrew Gaggiano (Occupational Hygiene Technician). We discussed the recent restructure in BHP Billiton that has resulted in the divestment of Cannington and a number of other assets to a new company, South 32. Mr Sharpe said that the group level documentation (GLD) rules and principles by which BHP Billiton assets operated will continue to apply at Cannington until South 32 developed new systems and documentation. There will be a gradual evolution from BHP Billiton GLD and systems without increasing the level of risk. Mr Sharpe said that, as an example, incident management is likely to be migrated away from 1SAP to a more dedicated and user friendly platform or tool.

Since my arrival at site, I had noted that there was a range of site clothing (not orange), which I felt was a move away from clean in clean out (CICO) and a dilution of lead (Pb) risk management. Mr Sharpe stated that the CICO would not be weakened with the prohibition on wearing 'work clothing' at the village will remain in place, other than for ESS staff.

After the meeting, Shane Johnson (Superintendent Haulage) and Lance O'Neill (Supervisor Haulage - Stingers) escorted me on an inspection of the underground operation. We inspected a number of areas and met with workers. The areas we visited included

- Service work on 245 mlv
- The crusher, including the control room; I noted that the communication on entering the area was good and clear. We were advised the area is mandatory respiratory protection area. In the control room, I noted that the room is positively pressurised using filtered pressurised air.
- The drawpoint from an Actinolite stope at 220 mlv. The mine has declared the area as mandatory respiratory protection and with airborne fibre monitoring undertaken during the campaign.

I met with a number of workers whilst underground. All were aware of their blood Pb and their personal frequency of testing. At the time of my inspection, I noted that the conditions underground were generally good and the roadways and travel ways were in excellent condition. I noted that some areas had high particulate levels, but the workers in those areas

were all wearing respiratory protection to AS/NZS 1715 - Class P2.

Later, Mr Gaggiano and I met with Adrian Bush (Superintendent - Mobile Plant Maintenance) and Hastings Deering employee Gordon Bontoft (Specialist Technical Support). Mr Bush described the work undertaken by Caterpillar as part of the CAT VR program. The project has seen a substantial reduction in the particulate output from each unit in the order of 75%. Mr Bush notified me that the mine performs gas testing and particulate testing in the engine exhaust as part of planned maintenance.

I met with Chris Briody (Specialist - Safety Analysis and Improvement) and Mr Gaggiano to discuss occupational hygiene and blood Pb monitoring.

I sighted a copy of CAN-HSEC-PROCEDURE-HEALTH-Lead Management (PRO-SM0031C, Version 23.0, issued 2-Sep-2013. I noted that there was confusing direction on applicable limits for women who are pregnant or are breastfeeding; there is an alert limit is 'N/A', a 'removal level' of 5 µg/dl and a 'return after removal' level of less than 10 µg/dl. The procedure calls of the development of a personalised 'health management plan that outlines areas for consideration for the worker to maintain health and productivity within their capacity, however, I was notified that women that are pregnant or breastfeed are 'not allowed at the site'. When I requested a copy of the change management documentation pertaining to the version 23.0, it was not available at the time of my inspection. I was eventually provided the documentation; the risk assessment had been documented in a Job Safety Analysis (JSA) format. The JSA format is not applicable to the reviewing the risks associated with a control system. PRO-SM0031C should be reviewed a supporting risk assessment to justify variations from the 'National Standard for the Control of Inorganic Lead at Work [NOHSC:1012]' and in light of proposed changes detailed in from http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/review-of-hazards-and-health-effects-of-inorganic-lead.

I had a closing meeting with Mr Sharpe. i discussed the need for a review of the blood Pb procedure. i also suggested that Cannington and Caterpillar promote to the industry as a whole the work that they have undertaken in achieving a significant reduction in particulate output from diesel plant.

Mark Desira
Senior Principal Occupational Hygienist
Northern Region

Queensland Government

Townsville Office
P.O. Box 1752, TOWNSVILLE QLD 4810
Phone: (07) 44479249, Fax: (07) 44479280

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	26/08/2014

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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On 26-Aug-2014, I conducted an inspection of Cannington mine focussing on lead (Pb) risk management.

On arrival at site I met with Greg Freeman (Health and Safety Manager – Improvement), Liam Gunning (Occupational Hygiene Specialist - Improvement) and Regina Gordon (Health Specialist – Improvement).

I sighted a copy of CAN-HSEC-PROCEDURE-HEALTH-Lead Management (PRO-SM0031C, Version 23.0, issued 2-Sep-20130. The procedure covers the management of lead risk from the perspective of serum Pb. The procedure covers all workers at Cannington, the Yurbi rail loading facility and the Townsville Port Operations. It is commendable to note that the procedure the recent review included a reduction to the removal limits to align with the Safework Australia's proposed blood exposure limit.

Mr Gunning stated that the mine completes respirator fit testing for all workers in Lead Risk Area and for workers with blood Pb above the alert level (10 µg/dl for females of reproductive capacity and 20 µg/dl for men and all other females). Fit testing is included as part of the periodic health surveillance. Since the health surveillance only covers employees, consideration should be given to the periodic assessment of contractors in a periodic fit testing program, the possibility of incorporating fit testing in the site induction is being considered.

I also sighted minutes of the Occupational Hygiene Steering Committee from July 2014. The meeting is attended by the SSE, in addition to superintendents accountable for the over-exposed SEGs. The steering committee meets monthly; exposure data for the month is reviewed as well as progress of exposure reduction projects which are cited in the 1 year plan.

In discussion with Ms Gordon, I sighted the taxonomies that have been conducted on blood Pb data. These taxonomies are reported to senior management, that is the Asset Leadership Team (ALT) and Cannington Leadership Team (CLT). The taxonomy is being well applied to the investigation of systematic (rather than individual) problems in managing blood lead (Pb); identifying areas or workcrews that have elevated blood Pb, which can then be contrasted with similar areas or other work crews to narrow into the behaviour or activity that is causing the

elevation of blood Pb.

The procedure includes a provision for 'exempt worker' -being exempt from the requirements of the procedure. I discussed the matter with Mr Gunning, Hunyati Groom (Specialist Learning & Development) and Anna Insard (Specialist Health Execution). Following the discussion, it was identified that the definition, scope and the process for obtaining exemptions are not rigorous; I indicated my concerns in the discussion and in my closing meeting with Mr Freeman and Vince De Carolis (General Manager and site senior executive).

I discussed the obligation of the mine to retain records for thirty (30) years. The records (electronic or hard copy) must be retained in a manner that ensures that the information is able to be recalled and is intelligible. Currently the mine is using Medgate® as the repository of the blood lead data. The SSE must ensure that the full blood lead record is transferred into the Medgate's successor to maintain accessibility to the data or that some other process is implemented to guarantee enduring access to the data.

I conducted an inspection of the process plant with Peregrine Barone (Processing plant supervisor). The plant is in the process of implementing mandatory respiratory protective equipment (RPE) for all areas except for air-conditioned office. Currently, RPE use is task based, however all the workers encountered in the inspection were wearing RPE when outside the control room or offices. All personnel in the processing plant with whom I met were familiar with their blood lead and how to manage the levels. Mr Barone stated that one of the more successful strategies had been the key performance indicator (KPI) for average blood lead. Workers had to ensure that their own blood lead average was below the target (17 µg/dl in 2013); all the workers in the process plant achieve the KPI. I noted that the process plant was generally well maintained with no noticeable odour of carbon disulphide (CS_2), the decomposition product of sodium ethyl xanthate. It was also noteworthy that there was limited or no build-up of material on the structures, walkways or the roadways

I conducted an underground inspection of the crusher level, escorted by David Kuilboer (Production Supervisor). We visited the crusher level; the crusher area has been declared 'mandatory RPE' area for any person outside air-conditioned vehicles. I met with service crew (one of the high risk SEGs); they described the administrative controls that had been implemented (jogging fans, washing down work areas). The workers that I met whilst underground were intimately aware of the blood Pb requirements and of their own blood Pb results, but were not aware of what risks are associated with high Pb exposure.

On return to the office, I discussed the variations in the clothing policy at the site, that is, the move away from full orange clothing. Mr Freeman said that there had been limited consultation with the health & safety section. The new clothing deteriorates rapidly in the aggressive laundering, especially the retroreflective panelling. With some of the recent changes to the purchasing systems, there is a risk that new materials or products will be introduced to the site that are not consistent with occupational hygiene, health and safety objectives.

I conducted a closing meeting with Mr De Carolis and Mr Freeman to discuss my findings.

Number	Recommendation	Due Date
1	**Exemption from Pre-Induction Requirements** It is recommended that the mine review the exemption process in reference to its application in lead risk management procedure The review should consider: · clearly defining the scope for exemption · grounds for which an exemption will not be granted (for example access to lead risk	N/A

areas)

- incorporation of a risk assessment to support the exemption;
- how the exemption is applied or withdrawn within the Site Access procedures

Mark Desira
Senior Principal Occupational Hygienist
Northern Region

Queensland Government

Townsville Office
P.O. Box 1752, TOWNSVILLE QLD 4810
Phone: (07) 44479249, Fax: (07) 44479280

Vision: Our Industries Free of Safety and Health Incidents

Recommendation

Subject:	**Induction Training and Assessment**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	26/08/2014
Record Date:	26/08/2014	**MRE Item No.:**	1

Title: Exemption from Pre-Induction Requirements

Description of Action Recommended to be Taken:
It is recommended that the mine review the exemption process in reference to its application in lead risk management procedure
The review should consider:
· clearly defining the scope for exemption
· grounds for which an exemption will not be granted (for example access to lead risk areas)
· incorporation of a risk assessment to support the exemption;
· how the exemption is applied or withdrawn within the Site Access procedures

References:
MQSHR 7, 8 & 138

Queensland Government

Townsville Office
P.O. Box 1752, TOWNSVILLE QLD 4810
Phone: (07) 4760 7404, Fax: (07) 4760 7400

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Postal Mine Record Entry	Northern	30/09/2013

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

In recent years, the Queensland Mines Inspectorate has conducted two separate reviews of personal exposures to Diesel Particulate Matter (DPM), measured as Elemental Carbon, in underground mines in 2007 and 2010.

This data was sorted into similar exposure groups (SEGs) and statistically analysed for each mine and used to make statistically valid comment on factors such as:

- the current state of personal exposures across Queensland underground mines.
- trends in personal DPM exposures since 2004.
- work groups / work roles receiving the highest exposures.

The Queensland Mines Inspectorate intends to repeat this exercise for the period January 2010 – August 2013. To assist with this process, you are requested to supply personal monitoring records for DPM that have been collected at your mine during this period.

A summary of results will be reported to the Health Improvement Advisory Council (HIAC) and Mining Safety & Health Advisory Council (MSHAC). Please note that the names of individuals or mines will not be disclosed during the presentation of this exposure data.

In addition to the exposure monitoring data, the mine is requested to provide:

- Exposure monitoring plan for the next 12 months
- current controls for DPM exposure
- activities or projects that the mine is planning to further reduce DPM exposure to workers and their timeline

Please forward information requested to the Inspectorate (tsvmines@dnrm.qld.gov.au) by **no later than 11 October 2013**.

If your have any further enquiries about this matter, please contact the Mines inspectorate on (07) 4799 7740.

Mark Desira
Senior Principal Occupational Hygienist
Northern Region

Queensland Government

Townsville Office
P.O. Box 1752, TOWNSVILLE QLD 4810
Phone: (07) 4760 7404, Fax: (07) 4760 7400

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	07/08/2013

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Mine Record Entry

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Site Safety & Health Reps Consulted: Ron Palmer and Andrew Bell

On 7-Aug-2013, I attended Cannington to undertake an inspection focussing on the mine's incident management system. James Coghlan, the District Workers' Representative was also at the mine, his findings are included in a separate Mine Record Entry.

We completed the full site surface induction, after which we met with the Cannington's new Site Safety and Health Representatives (SSHR), Ron Palmer (Long Hole Operator) and Andrew Bell (Technical Officer - Document Controller). We discussed the function and rights of SSHR, the physical area that the SSHRs and how the role interacts with the inspectorate.

I met with Johan Ferreira who demonstrated the modification that had been made to the Minearc for atmosphere testing. This modification is in response to a finding in an internal audit (Group level audit) that personnel seeking refuge in mine arc are not able to sample the outside atmosphere without opening the door and possibly compromising the atmosphere in the Minearc. The mine undertook the development and the modification has been approved by Minearc. A sampling port has been made in the bulkhead that allows a very small quantity of the atmosphere to be draw into the Dräger Pac 7000 gas detectors.

The modification has now been completed on all Minearc at Cannington, and the underground workers have been trained in the use of the unit. Mr Ferreira said that Cannington process is that once personnel have been evacuated to the mine arc, the emergency response team (ERT) is deployed under self contained breathing apparatus to respond the emergency; the ERT would assess the situation (gas testing, ground conditions and the like) to determine if the personnel in the Minearc can exit without risk.

I met with John Liston, Manager Communities Improvement' and currently acting in the Superintendent HSEC Execution, to discuss the scope of my inspection. Mr Liston assigned Rod Gilliland (Analyst Safety Execution) to aid in the extraction and collation of data pertaining to Incident management from 1SAP. In the course of my review, I also met with

- Greg Freeman — Manager Health and Safety Improvement
- Anna Isnard — Specialist Health Execution
- Regina Gordon — Specialist Health Improvement
- Stephanie Byrne — Specialist HSEC Reporting

Mr Gilliland provided me with a list of significant incidents that had been reported with the mine incident management system in the previous 18 months. I cross referenced the list the High Potential Incidents (HPI) that had been reported to the mines inspectorate; there was no incidents in the list that were not reported to the mine inspectorate

I randomly selected eight HPI and asked Mr Gilliland to collate information to demonstrate controls had been effectively implemented to prevent recurrence of significant incidents. Under the mine's SHMS, actions are nominated in the incident investigation and are assigned to an accountable person to complete. The accountable person completes the action and closes the action in 1SAP - the mine's information management system.

Mr Gilliland report produced information for two of the incidents (the task took in excess of two hours to complete); Mr Gilliland said that the manner in which information is organised in 1SAP does not allow for ready interrogation of data related to an incident. In the reports found, there was limited information as to how the action had been completed making the auditability of the control difficult.

Approximately 70 significant incidents had been reported in the period, however none had been formally reviewed (as required by the site's SHMS) and only four had a scheduled task to undertake the review the incident in 6 months.

Mr Freeman said that previously the mine incident management system was managed centrally by the Safety section within department of Health Safety Environment and Community (HSEC) using a dedicated database for incident management - First priority Enterprise (FPe). The transition from FPe to 1SAP had resulted in loss of the oversight and 'quality control' role of the HSEC department in incident management.

In the previous week, the mine had identified that the monthly report to the inspectorate had not included chronic injuries which have been classified by the mine as occupational illness. The mine has redressed this error, and submitted the correct information to the Mines Inspectorate. Whilst the mine has documented procedures for HPI and Lost time injuries, no documented process for the reporting requirements pertaining to the monthly reports for the mine inspectorate could be located. The mine's obligations to report incidents and illness should be formally documented to ensure compliance.

In the report of incidents that had not been previously notified, a disabling injury resulting from a rash had been identified. Discussions with Ms Gordon and Ms Insard uncovered that there are at least three other cases of workers that had presented with skin ailment such as dermatitis or rashes from the processing department. Two of the cases may even have a common timeline although the nature and severity of the symptoms is not identical. The incidence of such similar incidents should be reviewed collectively to determine if there is an association in their occurrence.

I met with the Troy Wilson, General Manager Operations and site senior executive (SSE), to discuss my findings. He confirmed that a number of processes for incident management had been 'hard coded' into FPe, which had been lost in the transition to 1SAP. He said that the site would address this matter by reviewing the incidents as part of the weekly 'Recall' meetings.

Number	Substandard Condition or Practice	Due Date
1	**Review Of Significant Incidents**	**15/10/2013**

The mine is required to implement a process that ensures that significant incidents reported at the mine site have been formally and systematically reviewed to ensure that controls have been effectively implemented to prevent recurrence.

The review should also assess the quality of evidence collated to demonstrate that an action had been addressed.

Number	Substandard Condition or Practice	Due Date
2	**Incidence of Rashes among Process Plant Workers**	**29/11/2013**

The mine is required to investigate the incidence of dermatitis or rashes among process plant workers. The investigation should be undertaken as multidisciplinary study, incorporating metallurgy, occupational hygiene and medical expertise.

The mine is requested to report the outcome of the investigation and any identified actions to the Inspectorate.

Number	Substandard Condition or Practice	Due Date
3	**Illness and Injury Reports**	**15/10/2013**

The Mine is required to develop a documented process to cover statutory reporting requirements. The protocol should cover both exception reports, such as subsequent to a high potential incident and routine reports, including but not limited to monthly disabled and lost time reports.

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Mark Desira
Senior Principal Occupational Hygienist
Northern Region


Mine Record Entry 3 Cannington Mine - 3 .msg


Mine Record Entry Response - Cannington Mine .msg

Substandard Condition Response- Incidence of Rashes among Process Plant Workers.msg

Queensland Government

Townsville Office
P.O. Box 1752, TOWNSVILLE QLD 4810
Phone: (07) 4760 7404, Fax: (07) 4760 7400

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Mark Desira, Senior Principal Occupational Hygienist

Subject:	**Mine Records**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	07/08/2013
Record Date:	22/08/2013	**MRE Item No.:**	1

Title: Review Of Significant Incidents

Description of Action Required to be Taken:
The mine is required to implement a process that ensures that significant incidents reported at the mine site have been formally and systematically reviewed to ensure that controls have been effectively implemented to prevent recurrence.

The review should also assess the quality of evidence collated to demonstrate that an action had been addressed.

References:
MQSHA section 15 & 7

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 15/10/2013

Completed: 27/09/2013**, Closed by:** Mark Desira **on** 30/09/2013 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

the mine has implemented new procedures that are detailed in the attached response

Queensland Government

Townsville Office
P.O. Box 1752, TOWNSVILLE QLD 4810
Phone: (07) 4760 7404, Fax: (07) 4760 7400

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Mark Desira, Senior Principal Occupational Hygienist

Subject:	**Investigation**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	07/08/2013
Record Date:	22/08/2013	**MRE Item No.:**	2

Title: Incidence of Rashes among Process Plant Workers

Description of Action Required to be Taken:
The mine is required to investigate the incidence of dermatitis or rashes among process plant workers. The investigation should be undertaken as multidisciplinary study, incorporating metallurgy, occupational hygiene and medical expertise.

The mine is requested to report the outcome of the investigation and any identified actions to the Inspectorate.

References:
MQSHA 195, MQSHR 7, 8, 9

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 29/11/2013

Completed: 09/12/2013**, Closed by:** Mark Desira **on** 09/12/2013 12:00:00 AM.

Reassigned Due Date: 19/12/2013; **Review conducted by** Mark Desira **on** 02/12/2013.

Action Taken by Mine to Comply with Corrective Action Requirement:

thge min has completed the investigation and found no common causal link.

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Townsville Office
P.O. Box 1752, TOWNSVILLE QLD 4810
Phone: (07) 4760 7404, Fax: (07) 4760 7400

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Mark Desira, Senior Principal Occupational Hygienist

Subject:	**Reporting**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	07/08/2013
Record Date:	22/08/2013	**MRE Item No.:**	3

Title: Illness and Injury Reports

Description of Action Required to be Taken:
The Mine is required to develop a documented process to cover statutory reporting requirements. The protocol should cover both exception reports, such as subsequent to a high potential incident and routine reports, including but not limited to monthly disabled and lost time reports.

References:
MQSHA 195

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 15/10/2013

Completed: 27/09/2013**, Closed by:** Mark Desira **on** 30/09/2013 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

the mine's procedures have been updated and new internal guidance is created for the correspondence of information pertaiing to incidents

Queensland Government

Townsville Office
P.O. Box 1752, TOWNSVILLE QLD 4810
Phone: (07) 4760 7404, Fax: (07) 4760 7400

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	03/04/2013

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Site Safety & Health Reps Consulted: Amir Halek

On 2 and 3-Apr-2013, I conducted an inspection of the Cannington operation.

After a site induction, I met with Johan Ferreira (Manager - Planning and acting Senior Site Executive). Mr Ferreira described the recent organisation structure changes with regards to the impact on occupational hygiene risk management, including the appointment of ventilation engineers, contracted occupational hygienist and technicians.

Mr Ferreira also outlined the review of the ventilation system by Rick Brake and that Dr Brake rebalanced the vent system and verified that the vent-sim model to reflected the 'as-built' system.

Curtis Smith (Senior Planning Engineer) demonstrated the vent sim model and the application to the mine in determining the impact of new drives and prediction of the potential short circuiting or recirculation of ventilation air flow, and how additional ventilation infrastructure can be modelled to determine its efficacy in achieving an acceptable level of ventilation.

Mr Smith stated that the Cannington ventilation was based on achieving a minimum vent rate of 0.06 m^3/kw/s; the vent rate takes into account all vehicles underground other than jumbos (which only utilise diesel to tram between worksites). Mr Smith said that the mine department used an Interaction Checklist which is one of the agenda items in the weekly meeting. The Interaction Checklist ensures that sufficient personnel and plant are available to undertake the planned activity, this also provide an input point for the ventilation engineer(s) that ensure the work area has sufficient quantity and quality of air for the based on all the planned activities into those headings. It also provides the vent engineers with opportunity to supply additional air to the work headings or restrict the mobile plant planned on the level. I sighted the interaction sheet for work planned on 31-03-2013 on 47g.78FZ which showed how the work had been achieved against the work plan.

The production crew has recently completed mining a high arsenic stope; the stope 52i.57HL has an average arsenic level of 12,085 ppm. there was not dedicated exposure monitoring conducted during the mining campaign for this stope.

Mr Smith also showed me the ventilation design for the new ore body, the Northern Outer Lens. Mr Smith and Max Tee (ventilation officer) demonstrated on vent sim the incremental development phases of the ventilation circuit.

Mr Smith told me about the workplan to recommission or reinstate the silencers on the secondary vent fans, Previously, the secondary ventilation 2 stage fans had produced noise level of 112 dB(A),. However there have been problems encountered with flange failures. Mr Smith also said that the installation of the vent fan with silencers are complex operations as a two stage fan with silencers is 6 metres and weighs 5 tonne, necessitating the use of a fan cradle.

I was escorted underground by Mr Tee, and we visited a number of the underground work sites including 605 mlv, 42E65.400, 450 mlv workshop and spoke to personnel at the 450 mlv crib room and the crusher crib room. At each heading and work site, Mr Tee took wet and dry readings as well as air flow reading. When we returned to the surface, Mr Tee demonstrated how the readings aligned with the vent-sim model.

I met with Liam Gunning (Occupational Hygienist) and Charles Buchanan (HSEC Superintendent) for an update of the occupational hygiene risk management program. Mr Gunning notified me that he had suspended all personal exposure monitoring for 3 months.

I spoke to a number of workers underground and all were aware of their latest blood lead results and how to manage their exposure.

Mr Gunning outlined exposure reduction program for diesel particulate matter (DPM) including:

- Caterpillar development of a Tier 4 engine which will reduce emissions
- Work with the maintenance to measure particulate output from diesel engines
- Replacement of the older fleet
- Improvements to the maintenance program to measure parameters to improve engine output

Mr Gunning stated that he is working on developing a clear understanding of the hygiene risk and developing a program for implementation. Mr Gunning said that he is not provided information on the blood lead levels of the workforce or SEGs i was not able to establish who at Cannington has oversight of the Blood Lead information.

Mr Gunning said that the noise levels underground are still in excess of the exposure standard, and there is some consideration of making hearing protection mandatory whilst underground. i sighted exposure monitoring data for DPM and noted that approximately 10 % are above the adjusted exposure standard.

I met with Mr Ferreira and Troy Wilson (General Manager and Site Senior Executive) to discuss my findings. Mr Wilson said that the introduction of Tier IV engine technology was not likely in the immediate future, however Mr Wilson detailed additional work to reduce exposure to DPM, including

- Mobile plant upgrades as part of new contracts
- Caterpillar's development of proprietary exhaust filters for the CAT fleet
- Peak 3 maintenance program for diesel plant

Mark Desira
Senior Principal Occupational Hygienist
Northern Region

Queensland Government

Mackay District Office
P.O. Box 1801, MACKAY QLD 4740
Phone: (07) 4967 1450, Fax: (07) 4953 2761

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	05/11/2014

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

With Mr Rohan Gilbert, person to control electrical work-underground, an inspection of underground electrical installations was made. On arrival on site an induction was completed for surface and underground visits. Prior to proceeding underground a brief discussion was had with the mine manager Mr Grant Aitchison.

The following areas of the underground operations were inspected:

1. 280 level substation
2. Jumbo rig DR109
3. 325 level substation
4. 450 level substation
5. Underground workshop
6. 570 level substation GEHO pumps
7. 575 level crusher

280 Level substation

The substation area was found to be well maintained. There was no dust accumulation and accessibility was good. The transformer oil had been changed out to FR3 fluid. It was noted that this and all transformers have fire detection systems installed. This is a positive measure.

The MCC in the substation was in good condition.

It was observed that protection relay testing appeared to be out of date.

Jumbo rig DR109

The drill rig had not been long overhauled and was found to be well maintained. No defects were observed in the electrical control boxes. The trailing cable installation was satisfactorily installed.

The cable was removed form the receptacle at the time of inspection. It was suggested that both plugs and receptacles be fitted with protection covers to prevent material getting into pins and sockets within the units.

325 Level substation

The installation was generally to a good standard. This transformer oil had also recently been changed out to FR3 fluid. There was an oil leak on the tank. Some leaks on transformers had occurred since the change of oil.

The MCC was adequately maintained although there were several knurled nuts missing form the top chamber area. All bolts, nuts and latches should be secure on doors so as to maintain the arc flash containment properties of enclosures.

450 Level substation

The installation around this substation was again to a good standard. The standard of fencing around such installations is good practice.

At DB37 the door of the enclosure can be opened to reset circuit breakers without isolating the panel. Although direct contact is limited through the installation of covers there is no protection against arc flash energy should a fault occur whilst switching the breakers. There is an incoming isolator available but is generally not used as it can shut down ventilation. The arc flash energy levels around this switchboard need to be understood so that the correct controls may be implemented.

Mr Gilbert did advise that where switching of any circuit breaker of a size greater than 400 amps then the category four rated suit is used. A 'buddy' is also present for such operations.

Underground workshop

The workshop crib room appliances were appropriately tested and tagged.

The parts washing machine tag was out of date. Mr Gilbert disconnected and tagged the unit out of service. The integrity of the seals against moisture ingress may be compromised on switchboard DB27809. This should be checked.

The general workshop area was found to be in a neat, clean and tidy state.

570 level substation GEHO pumps

This area was found to be well maintained.

Mr Gilbert explained the ring main unit (RMU) installation underground in response to question about identification of high voltage cable locations. It was suggested that because of the complexity of the RMU interconnections, absolute certainty on cable identification is necessary. He then explained that an electrical supervisor would always control the switching process and there is a drawing on the current status of the RMUs on the surface.

575 Level crusher

The substation area was observed to be adequately maintained. It was noted the increase accumulation of dust on electrical equipment but Mr Gilbert advised that a more frequent maintenance interval is set to cater for the conditions.

Some cable trays around the crusher itself have been targeted for replacement as soon as possible since they are badly rusted.

On return to the surface Mr Gilbert was able to show that the protection relays had been tested and that defects observed during testing had been input to the maintenance system for action.

The outstanding list of defects was viewed and the plans for rectification provided.

The outstanding tag and test dates need to be rectified and a system put in place to limit the 'misses'.

A view of the HV distribution system underground showed a hand marked up drawing with several different colours of 'felt pen'. Due to the complexity of this system and the concern

about possible misinterpretation, a way of better showing the status of the system should be implemented. This may be on the SCADA system.

A fault level and protection setting study was not viewed. In addition to such studies an analysis of the incident arc flash energies should be completed so as the establish the level of hazard present at all electrical installations. The appropriate controls can then be established.

In addition the above the touch and step potentials around electrical installations should be determined.

Whilst underground a discussion was had with the communications technician Mr Darren Pill on the operation of the proximity detection system installed on UG vehicles. The reliability of the system and system components was discussed. Some of the problems encountered were explained. Damage to components has caused some delays. At the same time I was able to discuss the use of the system with both a truck and loader operator. The comments on its use and its functionality were positive. Acceptance of the system was good with limited complaints. Persons had come to rely on the system.

Number	Substandard Condition or Practice	Due Date
1	**Electrical Installations**	**28/11/2014**

Provide to the inspectorate a plan to action defects listed in the mine record entry and actions to consider the opportunities for system improvements.

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Peter Herbert
Inspector of Mines
Central Region



Action MRE.msg RE Action MRE - electrical installation.msg FW Action MRE - electrical installation.msg

Queensland Government

Mackay District Office
P.O. Box 1801, MACKAY QLD 4740
Phone: (07) 4967 1450, Fax: (07) 4953 2761

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Peter Herbert, Senior Inspector of Mines (Electrical)

Subject:	**Electrical Installations**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	05/11/2014
Record Date:	09/11/2014	**MRE Item No.:**	1

Title: Electrical Installations

Description of Action Required to be Taken:
Provide to the inspectorate a plan to action defects listed in the mine record entry and actions to consider the opportunities for system improvements.

References:
MRE

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 28/11/2014

Completed: 26/11/2014**, Closed by:** Peter Herbert **on** 26/11/2014 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Action list provided.

Department of Natural Resources and Mines
Mackay District Office
P.O. Box 1801, MACKAY QLD 4740
Phone: (07) 4967 0860, Fax: (07) 4953 2761

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection - Weekend or Backshift	Northern	02/03/2013

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

Today I made an inspection of the progress of the installation of the proximity detection systems at the mine. On the morning of my visit and prior to travelling to site I advised the mines control room of my intended travel details as part of their remote area travel policy. Upon arrival at site I completed a surface and underground visitors induction. Mr Nigel Starkey, Superintendent Projects, then provided information on the status of the installation of the proximity detection systems on the machines at this stage. The mine has installed the Mine Site Technologies system .

I was then met by Mr Michael Moussie, Underground Electrical Supervisor, who has been involved with the installation. At this time all light vehicles and cap lamps are fitted with transmitters whilst all of the heavy vehicles except the Jumbo drill rigs are fitted with the complete system including touch screens.

The outer zone is set up and working whilst the inner zone is yet to be made operational. The inner zone detection systems is applied on all the heavy vehicles. The magnetic antenna's are being rewound to improve their sensitivity.

The installation on a truck at the surface was viewed. The location of the touch screen is in the left hand corner of the cab. The number of additional pieces of equipment in the cabin of the truck is increasing including: PED system screen, two way radio, reversing camera screen, proximity detection touch screen along with the normal machine gauges. The cabling for the system follows the existing wiring looms.

Further accompanied by Mr Grant Lowe, MST technician, a trip underground was made. At the surface lamp room a facility exists for the testing of the cap lamp identification on the way underground. This was in operation and correctly indicated the lamp holders name. The mine also uses a magnetic tag in tag out system for personnel location services. Mr Lowe took me through the presentation that is provided to all operators on the collision awareness system. It is not a detailed training program but an overview of the system.

Mr Lowe had in his vehicle the complete system including touch screen. Upon entering the portal there is also a tag reader device which can be used to check that the vehicles

identification system is operational. Whilst travelling down the mine the system readily identified all machines, light vehicles and persons that we encountered.

There is another verification point at one of the main entry areas. In this area I viewed the installation of a system in a loader. Again as in the trucks there are many extra items fitted in the cab of the machine again restricting visibility and requiring the operator to consider another device whilst operating the machine.

One of the issues observed was the activation of many alarms when the detection units passed close to a lunch room where there were many vehicles parked or many persons with cap lamps. This will have to be managed appropriately or the acceptance of the system may be compromised. Mr Lowe advised they were considering a form of 'shield' to isolate these areas.

In discussions with one of the operators several issues were raised with the use of the system. Issues such as the acceptance of alarms whilst operating joystick controls on loaders and the inadvertent steering off course, the multiple alarms at vehicle parking areas, lunch rooms etc. The operator expressed support for the system and could see the benefits of using such systems. He advised that he had had little training in the use of the system. However continued acceptance of such systems will be dependent on dealing with identified issues, having manufactures work with the end users on identified problems and finding out from operators where the system assisted them in preventing a collision or injury incident. To this end one suggestion is to have a feedback form for the operators so that they can submit suggestions, opportunities for improvements and any gripes with the system.

One of the important issues raised was the question of how the system would continue to alarm if the inner zone is working when a loader is loading into a truck. Is the alarm going off all the time (and potentially distract the operator) but if the operator got out of his truck would the alarm differentiate between signals?

Given the limited visibility out of the loaders and trucks this system has the potential to be major contributor to the situational awareness of the machine operator particularly in relation to light vehicles and pedestrian traffic. If the system operation is made reliable operators could become heavily dependent on it.

Advice was received that these systems were regarded as safety critical and thus the expectation would be that where the collision awareness system is not operational the machine should stop. It was observed that one operator stated his system was not operational-he was still operating the machine. Mr Lowe undertook to look at it immediately. It was also stated that a supervisor may allow a machine to operate without the collision awareness system being operational. If this is the case then the question is how is this allowed for in the procedure and what needs to change to allow for this system override?

Some of the challenges in installing such systems are firstly what does a successful implementation of a collision awareness system look like and secondly how can it be measured.

Attached to this mine record entry is a safety alert issued by the Commissioner for Mines which offers many challenges to the implementation of a successful collision awareness system. It is recommended that it be used as part of the analysis of the performance of your installed system.

The commitment by the mine to the successful implementation of the system is commended. Your support for my visit is appreciated and the input from your workforce was of great value.

At the completion of my inspection I provided to Mr Clinton Russell, Development Superintendent, a brief outline of my observations.

Prior to leaving site I completed the mines permission to leave site form that detailed my travel ensuring a safe return to my start point which is again part of the remote travel policy.

Peter Herbert
Inspector of Mines
Central Region

MRE Cannington.msg

Department of Natural Resources and Mines
Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Investigation	Northern	24/01/2013

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today, I attended site and met with Mr Grant Aitchison Mine Manager. Soon after we were joined by Mr Troy Wilson Site Senior Executive. Discussion was held on:

1. The failure of 45.91 Stope on 15/01/13 into 375 mLv while being paste filled and its later propagation upward toward the decline The decline was closed and the stope and failure area has been tight filled with paste. A production rig is presently on the decline drilling probe holes verifying the ground and fill expectations before the decline is able to be opened.

2.The investigation into the fire on a charge car in the surface fuel bay on 18/01/13. The investigation has shown the cause to be the lack of a cork washer normally on the splash-fill cap of the fuel tank. While the unit was being filled with the qiuck-fill mechanism this has pressurised the tank allowing atomised fuel to escaped onto hot engine parts starting the fire. .

3. The incident on 23/01/13 where a drill rod has dislodged from the rack of a jumbo as it reversed off the decline onto a level and the rod has penetrated the cabin through an inspection plate.

4. Mutual aid/assistance agreements for emergency response.

I then met with Mr Quenton Tooes, Production Engineer, who took me through the findings in relation to the 45.91 Stope failure and the draft corrective plans. I was also introduced to the geotechnical engineering team.

Later I went underground in the company of Mr Tooes and Mr Sam Robotham, Geotechnical Engineer. We went to the decline below 350mLv where the production rig is doing the probe drilling. Activities below this in the mine are very restricted (the crusher and one stope being mucked) until the decline is re-opened.

There were no activities going on underground as it was change-over day and the crews were still doing their roster pre-start meetings. We inspected a couple of sites in relation to a larger stope that is being developed (approximately 400,000 tonnes) and then left the mine. Persons were coming underground as we were coming out.

Phillip Casey

Inspector of Mines
Northern Region

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	15/10/2013

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today I visited the Cannington mine accompanied by Mr Sergio Cespedes (Inspector of mines Electrical) I attended site to undertake an inspection of the service and maintenance of mobile equipment, focusing mainly on contractors equipment such as Redpath and other smaller contractors on site.

On arrival we met Mr Michael Moussie (Electrical Supervisor) and Mr Cameron Mcomish, (Technical Supervisor) and while Inspector Cespedes conducted electrical inspections with Mr Moussie, I discussed the effectiveness of the change to 1SAP and the spot checks of contractors maintenance records with Mr Mcomish, he said that he checks maintenance on contractors equipment was in accordance to manufacturers specification.

Accompanied by Mr Mcomish, I visited the Redpath workshop and met Mr Mick Lenz (Maintenance Supervisor) and Mr Dean Callanan (Maintenance Supervisor), and we discussed maintenance practices employed by Redpath. I was provided samples of Pre start checklists and service maintenance sheets, I noticed the service sheets lacked a lot of information to assist in the servicing of the machine, items such as set pressures, allowable wear limits, and safety warnings.

Redpath fail to have an effective Tyre and Rim management system, they provide an SWI to conduct the task but fail to have a record that all fitters are trained and assessed to an acceptable standard. Mr Lenz said it was the intention for specialist tyre companies to fit their tyres on to rims, but this process has not as yet been established. He also recognise the need for a tyre handler attachment for the IT loader to assist in the fitting of the tyre and wheel assemblies to the machines.

Hydraulic equipment such as Torque multipliers, Enerpac rams and pumps were sent away twice a year for servicing. An inspection of the equipment in the Redpath workshop found that none contained a test tag, and the hydraulic equipment appeared to be in poor condition.

Mr Lenz said that they were in the process of establishing a new bunded area for their oil storage requirements, and the workshop floor was about to be refurbished as it was showing signs of wear and tear. He said that the new toilet block had been built but had yet to have the water connected to it.

I met Mr Sebastian Reddan (Work management business data controller) and I discussed the reliability of the new 1SAP recording system, a process, that involves the scanning of the maintenance service sheets hard copies and are stored in 1 SAP.

He showed me an example where a 1000 hour service sheet hard copy for a Caterpillar AD55B Dump truck, #120 is scanned and put into the system, after it is checked, signed and approved by the shift supervisor. Date and time is recorded and once closed off cannot be edited or changed, indicating a high degree of security.

I met Mr Glen Loveday (Maintenance Manager) just as he was about to leave the site and I provided a report of my findings. As a result, the following items need attention:

Number	Substandard Condition or Practice	Due Date
1	**Tyre and Rim Management**	**15/11/2013**

Redpath fail to have an effective Tyre and Rim management system, they provide an SWI to conduct the task but fail to have a record that all fitters are trained and assessed to an acceptable standard. Establish a process to ensure that all fitters are trained and assessed to an acceptable standard so that risk is as low as reasonably achievable. Refer MQSHR s 93

Number	Substandard Condition or Practice	Due Date
2	**Service sheets for mobile equipment**	**15/11/2013**

Mobile equipment service sheets lacked information to assist in servicing of the machine, items such as set pressures, allowable wear limits and safety warnings. Ensure that service sheets contain all OEM recommendations including system pressures and safety warnings. Refer MQSHR s 100

Number	Substandard Condition or Practice	Due Date
3	**Testing and Maintenance of hydraulic tools**	**15/11/2013**

Hydraulic equipment such as Torque multipliers, Enerpac rams and pumps were sent away twice a year for servicing. An inspection of the equipment in the Redpath workshop found that none contained a test tag, and appeared to be in poor condition. Establish a process of maintenance and testing of hydraulic equipment to ensure that when used, the risk of injury is as low as reasonably achievable. Refer MQSHR s 100

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Roy Perkins
Inspection Officer
Northern Region

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Roy Perkins, Inspection Officer (Mechanical)

Subject:	**Tyre and Rim Management**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	15/10/2013
Record Date:	21/10/2013	**MRE Item No.:**	1

Title: Tyre and Rim Management

Description of Action Required to be Taken:
Redpath fail to have an effective Tyre and Rim management system, they provide an SWI to conduct the task but fail to have a record that all fitters are trained and assessed to an acceptable standard. Establish a process to ensure that all fitters are trained and assessed to an acceptable standard so that risk is as low as reasonably achievable. Refer MQSHR s 93

References:
MQSH acts and MQSH regs

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 15/11/2013

Completed: 07/11/2013**, Closed by:** Roy Perkins **on** 07/11/2013 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Establishing an effective inspection and recording process

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Roy Perkins, Inspection Officer (Mechanical)

Subject:	**Service and Maintenance of Equipment**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	15/10/2013
Record Date:	21/10/2013	**MRE Item No.:**	2

Title: Service sheets for mobile equipment

Description of Action Required to be Taken:
Mobile equipment service sheets lacked information to assist in servicing of the machine, items such as set pressures, allowable wear limits and safety warnings. Ensure that service sheets contain all OEM recommendations including system pressures and safety warnings. Refer MQSHR s 100

References:
MQSH acts and MQSH regs

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 15/11/2013

Completed: 07/11/2013**, Closed by:** Roy Perkins **on** 07/11/2013 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Establishing and updating service sheets

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Roy Perkins, Inspection Officer (Mechanical)

Subject:	**Testing and Maintenance**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	15/10/2013
Record Date:	21/10/2013	**MRE Item No.:**	3

Title: Testing and Maintenance of hydraulic tools

Description of Action Required to be Taken:
Hydraulic equipment such as Torque multipliers, Enerpac rams and pumps were sent away twice a year for servicing. An inspection of the equipment in the Redpath workshop found that none contained a test tag, and appeared to be in poor condition. Establish a process of maintenance and testing of hydraulic equipment to ensure that when used, the risk of injury is as low as reasonably achievable. Refer MQSHR s 100

References:
MQSH acts and MQSH regs

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 15/11/2013

Completed: 07/11/2013**, Closed by:** Roy Perkins **on** 07/11/2013 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Establishing an inspection process

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	26/06/2013

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

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Today I visited the Cannington mine in the company of Mr Witek Jablonski (Inspector of Mines Mechanical) to conduct an inspection of mobile plant maintenance records. The site had advised it no longer wished to collect scanned copies of service sheets and would use the electronic system to capture all evidence of completion of maintenance tasks and histories.

We were met by Mr Stuart King (Mining Maintenance Superintendent) and Mr Adam Bamford (Analysis Improvement Superintendent). Mr King said that the site had in fact implemented a new electronic management system, 1SAP, which provided more functions than the replaced SAP.

Mr King said BHP Billiton's main collection centre for 1SAP was located in Houston Texas, but can be accessed and PDF copies taken of any document. He said that the maintenance service sheets are still given to the servicemen to be checked and signed off. This dated document is then scanned and electronically recorded. Mr King said that it will remain his policy not to discard the hard copies.

I reviewed a number of Preventative maintenance service sheets that had been scanned and logged into 1SAP and noticed that the Supervisor had completed/closed off that PM the following day. I also reviewed the electronic action log, which applies a time frame when these updates were conducted. Assuming that all recommendations from the OEM were met and based on the document provided and stored in 1SAP, the inspection, monitoring and recording was at an acceptable level.

Redpath, the mining contractor on site, maintenance reporting system remains the same and I stressed the need for the site to conduct spot checks to ensure that the site standard of mobile plant maintenance inspections and reporting for large and small contractors is at an acceptable standard.

We met Mr Shane Fielding (Small Projects Superintendent) and Inspector Jablonski discussed the outcomes issues mentioned previously, he said that the following were completed:

- Inner zones detection for underground Loaders and Light vehicles
- Silent zones at the 450ml Crib room for cap lamps to eliminate nuisance alarms on heavy equipment
- Validation zones at 450ml
- We inspected the surface cap lamp battery validation station

Roy Perkins
Inspection Officer
Northern Region

Witek Jablonski
Inspector of Mines (Mechanical)
Northern Region

Department of Natural Resources and Mines
Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	26/03/2013

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Today I attended site to conduct an inspection of Mobile Plant. The inspection centred around maintenance systems and included the management of the fleet of vehicles owned by Cannington and contractors. I met with Mr Glen Loveday (Maintenance Manager) and Mr Darren Reid (Maintenance Superintendent). Discussion was held in relation to maintenance practices used on site, Pre start checks, Service and maintenance of plant and Tyre and rim management. Mr Reid provided me information on the following:

- The pre start check list used on site for site and contractor mobile plant was specific to the machine and found to contain a criticality component, with the specific brake testing information on a sticker in the cab of the machine.
- An inspection of the Mobile equipment re-commissioning and Fire audit forms were found to be of a high standard.
- Wheel assembly coming off a loader, after tyre or rim repairs, the revised retensioning program is a controlled order locked on the dashboard of the vehicle to ensure retensioning of securing bolts is conducted to the appropriate standard.
- An inspection of service sheets for BHP Billiton Caterpillar AD55B Dump trucks and Caterpillar R2900G Loader from 250 and up to 2000 hour service schedule was found to be of a high standard. Redpath service sheets did not have the same accurate reference to the OEM manual and should be mapped to the site standard.
- A tyre and rim management is conducted by Bridgestone, and Mr Reid indicated that Redpath proposed doing the same.

Accompanied by Mr Reid, I inspected the maintenance workshops where I met Mr Laurie Mitchell (Maintenance Supervisor) for the light fleet, and at the Redpath workshop I met Mr Mick Lenz (Maintenance Superintendent) who provided me with copies of their mobile plant register and their 250 and 2000 hour service sheets. I found the workshops neat and tidy and observed that the pedestal grinders in both BHP and Redpath workshops had worn grinding wheels and an unsafe gap between wheel and tool post.

At a close out meeting with Mr Reid I outlined the findings of my inspection and as a result the following item needs to be addressed:

Number	Substandard Condition or Practice	Due Date
1	**Pedestal grinder safety**	**05/04/2013**

The pedestal grinders in both BHP and Redpath workshops had worn grinding wheels and had an unsafe gap between wheel and tool post. Establish a process of periodical workshop inspections, dress the grinding wheel and adjust the toolpost to minimal clearance, ensuring that all appropriate guards are in place. MQSHR Part 10 section 100

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Roy Perkins
Inspection Officer
Northern Region

Mine Site Visit 20130306.pdf

Queensland Government
Natural Resources, Mines and Water

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Roy Perkins, Inspection Officer (Mechanical)

Subject:	**Abrasive Wheel Safety**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	26/03/2013
Record Date:	17/04/2013	**MRE Item No.:**	1

Title: Pedestal grinder safety

Description of Action Required to be Taken:
The pedestal grinders in both BHP and Redpath workshops had worn grinding wheels and had an unsafe gap between wheel and tool post. Establish a process of periodical workshop inspections, dress the grinding wheel and adjust the toolpost to minimal clearance, ensuring that all appropriate guards are in place. MQSHR Part 10 section 100

References:
MQSH acts and MQSH regs

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 05/04/2013

Completed: 05/04/2013**, Closed by:** Roy Perkins **on** 22/05/2013 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Pedestal grinder has had its wheel dressed and tool post adjusted

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	04/09/2012

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

Today I visited the Cannington mine and met Mr Glen Loveday (Maintenance Manager) and we had a brief discussion on Pressure Vessels, Cranes and Lifting equipment on site.

I met Mr Tony Jaques (A/ Process Maintenance Superintendent) who told that Kone cranes conduct 12 weekly inspections and also carry out any repairs to any faults found, he said they also conduct a 12 monthly certification inspection/audit of the cranes. I was given a crane compliance weekly project status report, that covered every crane and hoist on site.

I was given samples of Kone Cranes inspection sheets, one stated that HT 46003, a 2t Reagent area hoist, was scheduled for replacement as the crane failed the 7 year inspection.

I reviewed an Al-rig inspection reports for *Lifting equipment - Chain & Lever hoists, Wire rope, synthetic rope and round slings. Sheave blocks, Girder trolley and Beam clamps. I noticed the current inspection coloured tag is yellow.

I met Ms Amy Vitale (Maintenance Superintendent) for Analysis & Improvement (ANI) engineering, formerly Reliability engineering, and we discussed Pressure Vessel inspections and Ms Vitale gave me an inspection report conducted by Inspections, Xray & Testing (IXT) dated the 28 November 2011 for the Diverter Gate Air Receiver RC 41730. which identified three recommendations for the air receiver and one for the Pressure relief device which was found to be leaking at the seal, the action specified immediate replacement, I could not confirm if these actions were completed.

Accompanied by Mr Chris Irwin (A/Supervisor) I conducted an inspection of the workshops which I found clean and tidy. For people needing to operate the Centre Lathe and Pedestal Drill, there is a cardex system that electrically isolates the equipment and only permits those qualified and authorised to use the machines. This control had been disconnected allowing anyone to use the machines.

The Boiler shop Pedestal grinder had a worn grinding wheel with a dangerous gap between the grinding wheel and its tool post.

The hazardous substances and dangerous goods cabinet and material safety data sheets (MSDS) was located away from the workshop, this encourages workshop personnel to store flammable spray cans in their lockers, this was confirmed, as one locker was left open.

I spoke to Mr Ed Cooney (Mining Manager) as Mr Loveday was not available for me to

provide feedback on my findings, the following items need to be addressed:

Number	Recommendation	Due Date
1	**Workshop Practices**	**N/A**

To ensure that people operating the Centre Lathe and Pedestal Drill, there is a cardex system used as an isolator for the machines, this system identified those qualified and authorised to use these machines. This control had been disconnected allowing anyone to use the machines. Establish a control to ensure that only qualified and competent personnel operate workshop equipment to ensure the standard is maintained. Refer MQSHR 100 & 106

Number	Substandard Condition or Practice	Due Date
2	**Inspection of plant**	**12/10/2012**

An inspection conducted by IXT dated the 28 November 2011 on the Diverter Gate Air Receiver RC41730 identified three recommendations for the air receiver and one for the Pressure relief device which was found to be leaking at the seal, the action necessary for the PSV was immediate replacement, I could not confirm if these actions were completed. Establish a process to ensure that recommendations from specialist plant inspectors is carried in a timely manner. Refer MQSHR s 100

Number	Substandard Condition or Practice	Due Date
3	**Pedestal Grinder**	**12/10/2012**

The Boiler shop Pedestal Grinder had a worn grinding wheel with a dangerous gap between the grinding wheel and its tool post. Establish a process of regular inspection of workshop equipment. The Pedestal Grinders need the grinding wheels dressed, and the toolpost adjusted to minimal clearance between the wheel and toolpost. Refer MQSHR s 106

Number	Substandard Condition or Practice	Due Date
4	**Hazardous Substances and Dangerous Goods**	**12/10/2012**

The hazardous substances and dangerous goods cabinet and material safety data sheets (MSDS) was located away from the workshop, this encourages workshop personnel to store flammable spray cans in their lockers, this was confirmed as one locker was left open. Ensure that hazardous substances and dangerous goods are stores in the flame proof cabinet and MSDS are easily located nearby. Refer MQSHR s 56 & 57

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Roy Perkins
Inspection Officer
Northern Region

20120904 response.doc

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Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
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Vision: Our Industries Free of Safety and Health Incidents

Recommendation

Subject:	**Workshop Practices**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	04/09/2012
Record Date:	11/09/2012	**MRE Item No.:**	1

Title: Workshop Practices

Description of Action Recommended to be Taken:
To ensure that people operating the Centre Lathe and Pedestal Drill, there is a cardex system used as an isolator for the machines, this system identified those qualified and authorised to use these machines. This control had been disconnected allowing anyone to use the machines. Establish a control to ensure that only qualified and competent personnel operate workshop equipment to ensure the standard is maintained. Refer MQSHR 100 & 106

References:
MQSH acts and MQSH regs

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Substandard Condition or Practice

Issued By: Roy Perkins, Inspection Officer (Mechanical)

Subject:	**Inspection of plant**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	04/09/2012
Record Date:	11/09/2012	**MRE Item No.:**	2

Title: Inspection of plant

Description of Action Required to be Taken:
An inspection conducted by IXT dated the 28 November 2011 on the Diverter Gate Air Receiver RC41730 identified three recommendations for the air receiver and one for the Pressure relief device which was found to be leaking at the seal, the action necessary for the PSV was immediate replacement, I could not confirm if these actions were completed. Establish a process to ensure that recommendations from specialist plant inspectors is carried in a timely manner. Refer MQSHR s 100

References:
MQSH acts and MQSH regs

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 12/10/2012

Completed: 09/10/2012**, Closed by:** Roy Perkins **on** 09/10/2012 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

See attachment

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Substandard Condition or Practice

Issued By: Roy Perkins, Inspection Officer (Mechanical)

Subject:	**Abrasive Wheel Safety**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	04/09/2012
Record Date:	11/09/2012	**MRE Item No.:**	3

Title: Pedestal Grinder

Description of Action Required to be Taken:
The Boiler shop Pedestal Grinder had a worn grinding wheel with a dangerous gap between the grinding wheel and its tool post. Establish a process of regular inspection of workshop equipment. The Pedestal Grinders need the grinding wheels dressed, and the toolpost adjusted to minimal clearance between the wheel and toolpost. Refer MQSHR s 106

References:
MQSH acts and MQSH regs

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 12/10/2012

Completed: 09/10/2012**, Closed by:** Roy Perkins **on** 09/10/2012 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

See attachment

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Substandard Condition or Practice

Issued By: Roy Perkins, Inspection Officer (Mechanical)

Subject:	**Hazardous Substances and Dangerous Goods**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	04/09/2012
Record Date:	11/09/2012	**MRE Item No.:**	4

Title: Hazardous Substances and Dangerous Goods

Description of Action Required to be Taken:
The hazardous substances and dangerous goods cabinet and material safety data sheets (MSDS) was located away from the workshop, this encourages workshop personnel to store flammable spray cans in their lockers, this was confirmed as one locker was left open. Ensure that hazardous substances and dangerous goods are stores in the flame proof cabinet and MSDS are easily located nearby. Refer MQSHR s 56 & 57

References:
MQSH acts and MQSH regs

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 12/10/2012

Completed: 09/10/2012**, Closed by:** Roy Perkins **on** 09/10/2012 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

See attachment

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	18/06/2012

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Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

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Today I visited the Cannington mine to conduct an inspection of maintenance systems for a planned shutdown of 72 hours, from Friday 15th June to Monday 18th June of the Process plant underground. I was met by Mr Stuart King (Maintenance Superintendent) and Mr Col Barrett (A/Superintendent Mechanical Planning) who said that the day before the shutdown commences contractors are brought to site to identify the scope of work.

During a round the clock shutdown, there are 2 BHP Superintendents enlisted from the engineering ranks, one for each shift and a number of group leaders selected from the 8 BHP Fitters and 1 Boilermaker who would work alongside the contractors, these BHP employees ensure that correct isolations, SWI's and JSA's are used. I was provided and I reviewed the following documents relating to the shutdown:

* Organisational chart June 2012 Underground Processing Plant shutdown

* Underground shutdown meetings - June 2012 Thursday 14/6/12 to Monday 18/6/12

* Production Pre-shut activities (Thursday) Crusher, Collection, Load out station, Winder

* Contract partner employee pre-induction checklist, Mandatory training and induction

* Shutdown Supervisors, Group leaders and contractor classification spreadsheet

* Risk assessment report

* Issues log June 2012. What could be done better

I also reviewed a sample of a permit to work that was used on the job, and I left the site feeling the shutdown process on this job was of a high standard.

Roy Perkins
Inspection Officer
Northern Region

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	17/01/2012

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Mine Record Entry

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Today I attended site to conduct an inspection of Mobile Plant. The inspection centred around maintenance systems and included the management of the fleet of vehicles owned by Cannington and contractors. I met with Mr Tony Ross (Maintenance Manager) and Mr Darren Reid (Maintenance Superintendent) Discussion was held in relation to the high potential incident. A Normet Agitator trucks brakes failed when the engine of the vehicle stopped.

I was provided and I reviewed the following documents:

- Service sheets, the sample was for an AD55B Dump truck, and it incorporated accumulator nitrogen pressure checks.
- Pre start checklist, specifically of each piece of equipment, incorporating criticality and service and park brake test requirements. * Note accumulator capacity compression test could be included.
- Tyre and rim management. Also tyre checking kit- tread depth, pressure gauges, and training in place, was found to be at a high standard.

The Normet Agitator truck brake failure, together with the investigation report the following was observed:

- Unplanned engine shutdown. The reason for this is still not known.
- Lack of communication/understanding of latest OEM requirements between OEM and mine site.
- Time delay of brake application
- No Nitrogen in accumulator, no pressure retention.
- Hydraulic lines worn through. - Loss of hydraulic fluid led to ineffective service brakes.
- Report of low engine coolant and/or overheating.

An inspection of the Redpath workshop observed the following:

- No Material safety data Sheets (MSDS) easily available for workers, for hazardous substances and dangerous goods.
- Pedestal grinders had badly worn grinding wheels.
- Fire extinguishers had equipment stored in front of them, preventing easy access.

At a close out meeting with Mr Reid I outlined the findings of my inspection, and the following need to be addressed:

Number	Substandard Condition or Practice	Due Date
1	**MSDS**	**17/02/2012**

Hazardous substances and dangerous goods are kept and used in the workshop, but no provisions for easy access to the relevant material safety data sheets for workshop personnel were found. Undertake a program to ensure that all workshop personnel are aware of the existence of material safety data sheets and have easy access to them in the workshop. Refer to Mining and Quarrying Health and Safety Regulations 2001 Part 7 Section 52.

Number	Substandard Condition or Practice	Due Date
2	**Pedestal Grinder Safety**	**17/02/2012**

A Pedestal grinder with a worn grinding wheel had a substantial gap between the toolpost and grinding wheel. Establish a process of periodical workshop inspections. Dress the grinding wheel and adjust the toolpost to minimal clearance, ensuring that all appropriate guards are in place. MQSHR Part 10 section 100

Number	Substandard Condition or Practice	Due Date
3	**Fire extinguisher safety**	**17/02/2012**

Fire Extinguishers with stored items preventing easy access to Emergency Equipment. Establish a process of periodical site inspections to ensure easy access to Fire Extinguishers and Emergency Equipment. Refer MQSHR Section 32

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Please advise me in writing of the completion of the above items, on or before the due date.

Roy Perkins
Inspection Officer
Northern Region

CAN-PRESIDENCY-Legal-Mine Record Entry Response 15.02.2012 - Redpath Maintenance Workshop.pdf

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Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Roy Perkins, Inspection Officer (Mechanical)

Subject:	**MSDS**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	17/01/2012
Record Date:	23/01/2012	**MRE Item No.:**	1

Title: MSDS

Description of Action Required to be Taken:
Hazardous substances and dangerous goods are kept and used in the workshop, but no provisions for easy access to the relevant material safety data sheets for workshop personnel were found. Undertake a program to ensure that all workshop personnel are aware of the existence of material safety data sheets and have easy access to them in the workshop. Refer to Mining and Quarrying Health and Safety Regulations 2001 Part 7 Section 52.

References:
MQSH acts and MQSH regs

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 17/02/2012

Completed: 16/02/2012**, Closed by:** Roy Perkins **on** 16/02/2012 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

See attachment

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Mount Isa District Office
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Substandard Condition or Practice

Issued By: Roy Perkins, Inspection Officer (Mechanical)

Subject:	**Abrasive Wheel Safety**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	17/01/2012
Record Date:	23/01/2012	**MRE Item No.:**	2

Title: Pedestal Grinder Safety

Description of Action Required to be Taken:
A Pedestal grinder with a worn grinding wheel had a substantial gap between the toolpost and grinding wheel. Establish a process of periodical workshop inspections. Dress the grinding wheel and adjust the toolpost to minimal clearance, ensuring that all appropriate guards are in place. MQSHR Part 10 section 100

References:
MQSH acts and MQSH regs

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 17/02/2012

Completed: 16/02/2012**, Closed by:** Roy Perkins **on** 16/02/2012 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

See attachment

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Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Roy Perkins, Inspection Officer (Mechanical)

Subject:	**Fire extinguishers**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	17/01/2012
Record Date:	23/01/2012	**MRE Item No.:**	3

Title: Fire extinguisher safety

Description of Action Required to be Taken:
Fire Extinguishers with stored items preventing easy access to Emergency Equipment. Establish a process of periodical site inspections to ensure easy access to Fire Extinguishers and Emergency Equipment. Refer MQSHR Section 32

References:
MQSH acts and MQSH regs

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 17/02/2012

Completed: 16/02/2012**, Closed by:** Roy Perkins **on** 16/02/2012 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

See attachment

Queensland Government

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	15/04/2014

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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Today I came to site to undertake an inspection of the surface electrical equipment and installations. I met on arrival Mr. Jason Lindley, Surface Maintenance Superintendent and we discussed the scope of the inspection and the changes that are being made in the maintenance section management structure; which includes a permanent electrical supervisor and appointed person to control electrical work for the Village and auxiliary installations.

Then Mr Lindley introduced me Mr Deon Johnson, Surface Electrical Supervisor and appointed person to control electrical work who assisted me during the inspection of the surface areas where the following it was observed and discussed:

In the Village Gymnasium, three small lighting and power distribution boards (DB) inside the building had only one lockout device for isolation hanging from a cord. The devices in many cases did not fit with the toggles to isolate and lock out the circuit breakers and there was only one for each board

A new substation was being installed at the Village with two almost identical Kiosks or enclosures to replace the old Kiosk No. 1, where a serious accident occurred on the 02 April 2011. The following it was observed:

1. The 1000 Amps main circuit breaker in each of the Kiosk seemed to be too big for the 500 kVA 11.0.415 kV power transformers
2. The two mentioned main circuit breakers had the connections done with copper bars covered only with perspex and they have to be closed and opened by persons using the device's toggle standing in front; therefore without protection from potential arc flashes and or blasts.
3. The bottom part was open and this will allow the ingress of vermin that may render the installations to unsafe conditions
4. Some of the circuit breakers had the identification labels on the front of the devices and not in a fix place to avoid losing the labels when the devices are replaced.
5. As soon as these new Kiosks are commissioned, the old Kiosk No. 1 will be disconnected and removed.

In the main lighting and power distribution board No. DB66901A of the Construction Camp:

1. The 600 Amps main circuit breaker did not have the required facilities for isolation and lockout.
2. The Ampere meter instrument had the selector switch knob missing
3. The distribution board did not have facilities for the periodic safe testing of the effectiveness of the residual current devices (RCDs)
4. Some of the labels on the isolation circuit breakers were becoming detached
5. There was a sticker indicating that last RCD tests were completed on 23/06/2012 and the next test was due 23/06/2013, in other words the tests were overdue
6. Another sticker showed the last Thermal image tests were carried out on 12/12/2009
7. New steel wire armoured (SWA) cables were installed to replace the old conductors.

In the Construction Camp DB No. SB66901A-1:

1. The isolation switches did not have facilities for isolation and lockout
2. The RCDs had the regular tests overdue with the same dates as previous one mentioned above

In the Village, the Kiosk 500 kVA, 11/0.415 kV substation No. 3:

1. The accumulation of rust in the door hinges did not allow to open properly on the high voltage side
2. The lighting and power DB had two pole fillers missing, creating access to live parts
3. The two RCDs did not have facilities for the regular tests of effectiveness

In the enclosure of the Sewerage Pump No. 6690, the aluminium cable glad plate had the protective earthing connection missing, the plastic cable trunks were missing.

In the Exploration buildings compound the lighting and power distribution board No. DB62701:

1. The RCD did not have facilities for safe testing
2. Some pole fillers missing, creating access to electrical live parts that could be accidentally touched
3. The main and some of the circuit isolation circuit breakers did not have facilities for isolation and lockout
4. Some of the lockout devices installed were not working properly and other were not fit for purpose.
5. In the core shed, there were some electrical appliances with overdue test tags.

In the McNab Contractors compound were personnel are working in upgrading the tailings dam:

1. Inside of the office building, there were two small DBs with the circuit breakers without facilities for isolation and lockout
2. In the 60 kVA diesel electrical power generation unit, one of the lockout devices was broken and none of the isolation devices behind the metallic door had the required facilities for isolation and lockout.
3. The earthing bar of the power generation unit was only partially buried
4. In the main Distribution Board the circuit breakers did not have facilities for isolation and lockout and the labelling has to be improved as they had written the colour of the conductor phases and the RCD number instead clearly identifying the circuit they were protecting for safe isolation

On our way back to the offices, we inspected the DB Mine Entrance 1 distribution board, where:

1. Two pole fillers were missing
2. Two isolation switches did not have facilities for isolation and lockout
3. The board did not have facilities for the regular safe testing of effectiveness of the RCDs
4. The bottom of the enclosure had indication of water ingress and rust
5. The protective earthing connection to the SWA cable glands plate had the steel bolt corroded by rust; therefore not longer in a fit for purpose manner
6. The main circuit breaker had the terminals exposed and without the arc barriers between the phases.

Once we were back in the workshop, I sighted records of regular inspections and tests of the RCDs and I was informed the maintenance records were being transferred from the old SAP to the new version and for this reason I was not able to sight the maintenance records of the places inspected.

I met then Mr Ross Bannerman, Electrical Engineer and Mr Peter Fortington, Projects Supervisor and together we visited the new tailings dam water pumps and the their electrical controls in the Motor Control Centre to follow up the corrective actions given to the site during previous inspection and all the issues have been addressed. We also discussed the design and installation of the new substation at the Village with the two Kiosks above mentioned and some of the issues were:

- The 1000 Amperes Main Circuit Breaker installed in each of the two Kiosks; which as per discussions it appears they too big for the transformer size.
- There it was not effective control measures to protect personnel that has to open or close the main circuit breakers as they have to operate the toggle of the device standing in front and the copper bars used to connect the device on the top and bottom are protected only for a transparent perspex sheet.
- It was not known the amount of electrical energy that will be available during potential arc flashes and blasts when operating the devices
- The way the circuit breakers protecting each of the circuits is unconventional (touching against each other) for reasons above explained.
- The additional flexibility they are trying to achieve to cover possible future changes at the Village, particularly if the open pit project goes ahead and they need to provide more accommodation for the additional persons to be hired.
- The emergency diesel driven generator that was kept available at the Village has been removed and there is not intention to replace it and the site has decided to take the risk of lost of electrical power to critical services on the area (cold rooms, kitchen, air conditioning for shift workers, etc) in case of serious failure or damage to the power lines feeding the area.

Before leaving the site, Mr Fortington took me to the office of Mr Hugh Ly, Electrical Engineer responsible for the Village project to discussed the same issues above mentioned. Mr Hugh will provide relevant documents associated with the project as per our discussions and summary document I gave him about the subject; which are required under Section 112 Specifications, instructions and other information about plant and Section 113 Records of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

I mentioned to Mr Fortington, Mr Bannerman and Mr Hugh the accident that have occurred in some mines of the region where circuit breakers other than in lighting and power distribution boards units have been connected up side down causing severe electric shocks and major

equipment and protections failure to avoid having similar issues. The correct manner to connect the devices are clearly explained in the Australian Standard AS3000 Wiring Rules.

As result of the inspection and discussions with above mentioned persons, the following requires attention:

Number	Substandard Condition or Practice	Due Date
1	**Issues mentioned in the body of the report**	**15/05/2014**

There are a number of safety and statutory issues mentioned in the body of the report associated with requirements of the Australian Standards and mining legislation.

Action has to be taken to address the issues mentioned in the body of the report and also verify these issues do not exist on other areas of the mine to avoid the exposure of personnel to unacceptable levels of risk.
Reference: Section 39 Obligations of site senior executive for mine of the Mining and Quarrying Safety and Health Regulation 2001, Section 108 Monitoring and Section 109 Service and maintenance of the Mining and Quarrying Safety and Health Regulation 2001 as amended

Number	Substandard Condition or Practice	Due Date
2	**Repetitive substandard conditions in electrical installations**	**16/06/2014**

During the inspections of electrical installations, equipment and systems, the common finding is as mentioned in the body of the report defects in lighting and power enclosures, such as missing pole fillers, the so called statutory testing not being carried out as per site schedule, isolation devices without the required facilities for safe isolation, protective earthing not properly installed and or maintained, ingress of water into the enclosures, etc.

A complete investigation of the possible reasons (e.g. management, resources, persons attitude and moral, technical knowledge, poor supervision, lack of competencies, lack of safety awareness, etc), behind the substandard management of the electrical installations and equipment as mentioned in the inspection report has to be carried out and a copy to be provided for further discussions with site management.

It is acknowledged that a significant effort has been made in the past to manage in an effective manner the safety of the electrical work with some success; however as the electricity is a hazard that exists in almost all areas of the mine (and it is the cause of serious and fatal accidents), including the Village and installations associated, I believe it is critical to find the real causes of the issues mentioned in the report to find an effective way to eliminate them from the root.

References: Section 30 Obligations for safety and health, Section 36 Obligations of persons generally and Section 39 Obligations of site senior executive for mine of the Mining and Quarrying Safety and Health Act 1999.

Number	Substandard Condition or Practice	Due Date
3	**Electrical issues in McNab Contractors compound**	**16/06/2014**

It was observed during the inspection several issues associated with electrical safety were found in the contractors compound buildings and facilities. The appointed persons to control electrical work have the obligations of ensuring all temporary buildings, facilities, power generation, etc. brought to the mine are in full compliance with site and statutory requirements; otherwise the equipment and installations cannot be energised.

If the site has a process for inspecting and approving contractors buildings, equipment and facilities for use at the mine operated by electricity, it has to be reviewed to ensure the above is achieved and the relevant persons within the organisation structure of the mine sign the final approval for their installation and use. Should it be the case that such process or procedure do not exist, a formal and approved process has to be developed and established to ensure full compliance with the statutory requirements and site specifics.

Reference: Part 2 Safety and health risk management of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Sergio Cespedes
Inspector of Mines
Northern Region

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Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Sergio Cespedes, Inspector of Mines (Electrical)

Subject:	**Electrical Defects**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	15/04/2014
Record Date:	22/04/2014	**MRE Item No.:**	1

Title: Issues mentioned in the body of the report

Description of Action Required to be Taken:
There are a number of safety and statutory issues mentioned in the body of the report associated with requirements of the Australian Standards and mining legislation.

Action has to be taken to address the issues mentioned in the body of the report and also verify these issues do not exist on other areas of the mine to avoid the exposure of personnel to unacceptable levels of risk.
Reference: Section 39 Obligations of site senior executive for mine of the Mining and Quarrying Safety and Health Regulation 2001, Section 108 Monitoring and Section 109 Service and maintenance of the Mining and Quarrying Safety and Health Regulation 2001 as amended

References:
Section 39 Obligations of site senior executive for mine of the Mining and Quarrying Safety and Health Regulation 2001, Section 108 Monitoring and Section 109 Service and maintenance of the Mining and Quarrying Safety and Health Regulation 2001 as amended

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 15/05/2014

Completed: 30/06/2014**, Closed by:** Sergio Cespedes **on** 30/06/2014 12:00:00 AM.

Reassigned Due Date: 30/06/2014; **Review conducted by** Sergio Cespedes **on** 16/05/2014.

Action Taken by Mine to Comply with Corrective Action Requirement:

As per information attached to the inspection report

Queensland Government

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Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Sergio Cespedes, Inspector of Mines (Electrical)

Subject:	**Management**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	15/04/2014
Record Date:	22/04/2014	**MRE Item No.:**	2

Title: Repetitive substandard conditions in electrical installations

Description of Action Required to be Taken:
During the inspections of electrical installations, equipment and systems, the common finding is as mentioned in the body of the report defects in lighting and power enclosures, such as missing pole fillers, the so called statutory testing not being carried out as per site schedule, isolation devices without the required facilities for safe isolation, protective earthing not properly installed and or maintained, ingress of water into the enclosures, etc.

A complete investigation of the possible reasons (e.g. management, resources, persons attitude and moral, technical knowledge, poor supervision, lack of competencies, lack of safety awareness, etc), behind the substandard management of the electrical installations and equipment as mentioned in the inspection report has to be carried out and a copy to be provided for further discussions with site management.

It is acknowledged that a significant effort has been made in the past to manage in an effective manner the safety of the electrical work with some success; however as the electricity is a hazard that exists in almost all areas of the mine (and it is the cause of serious and fatal accidents), including the Village and installations associated, I believe it is critical to find the real causes of the issues mentioned in the report to find an effective way to eliminate them from the root.

References: Section 30 Obligations for safety and health, Section 36 Obligations of persons generally and Section 39 Obligations of site senior executive for mine of the Mining and Quarrying Safety and Health Act 1999.

References:
Section 30 Obligations for safety and health, Section 36 Obligations of persons generally and Section 39 Obligations of site senior executive for mine of the Mining and Quarrying Safety and Health Act 1999.

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 16/06/2014

Completed: 30/06/2014**, Closed by:** Sergio Cespedes **on** 30/06/2014 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

As per information attached to the inspection report

Queensland Government

Mount Isa District Office
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Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Sergio Cespedes, Inspector of Mines (Electrical)

Subject:	**Contractor Management**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	15/04/2014
Record Date:	22/04/2014	**MRE Item No.:**	3

Title: Electrical issues in McNab Contractors compound

Description of Action Required to be Taken:
It was observed during the inspection several issues associated with electrical safety were found in the contractors compound buildings and facilities. The appointed persons to control electrical work have the obligations of ensuring all temporary buildings, facilities, power generation, etc. brought to the mine are in full compliance with site and statutory requirements; otherwise the equipment and installations cannot be energised.

If the site has a process for inspecting and approving contractors buildings, equipment and facilities for use at the mine operated by electricity, it has to be reviewed to ensure the above is achieved and the relevant persons within the organisation structure of the mine sign the final approval for their installation and use. Should it be the case that such process or procedure do not exist, a formal and approved process has to be developed and established to ensure full compliance with the statutory requirements and site specifics.

Reference: Part 2 Safety and health risk management of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

References:
Part 2 Safety and health risk management of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 16/06/2014

Completed: 16/05/2014**, Closed by:** Sergio Cespedes **on** 16/05/2014 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

Contractors finished the site work and left the mine

Queensland Government

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	15/10/2013

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

Today accompanied by Mr Roy Perkins, Inspection Officer - Mechanical, I attended site to undertake an inspection of the electrical equipment and installations of the Concentrator and underground mobile plant.

On arrival we met Mr Michael Moussie, Electrical Supervisor and meanwhile Mr Perkins went to inspect the mechanical plant equipment, Mr Moussie took me to the engineering office to meet Mr Peter Fortington, Project Electrical Supervisor and Mr Ross Brannerman, Electrical Engineer and together we went to inspect the project work for the replacement of the two tailings water pump from 220 kW to 375 kW.

We discussed the installation of the steel wire armoured cables, the protective earthing and control conductors on the field. Then we went to the switchrooms (Grinding and Flotation) to inspect the variable speed drives and power controls for each of the 375 kW electric motors..

Once back in the office, we went though the Project Management Plan and commissioning information and data being put together associated with the project and discussed the type of tests and records that have to be developed and kept available and up to date to satisfy the requirements of the Mining and Quarrying Safety and Health Regulation 2001, Sections 112 Specifications, instructions and other information about plant and Section 113 Records. It was observed the maintenance personnel had not been involved well enough in the development of the project to provide input on the maintenance and testing facilities required for the normal operation and maintenance of the new equipment and controls. Please provide copy of the current document (Project Management Plan or Project Execution Plan) in place and being used.

I then went underground with Mr Moussie, to inspect the mobile equipment, where we found in a Tamrock jumbo that had been tagged out for repairs some flammable spray cans and a couple of appliances leads without current test tags. Several control devices had the identification labels on their body and or on a plastic cable tray cover that sometimes go missing, therefore the labels are lost.

We discussed the interlocks of the hydraulic jacks of the jumbos with the 1000 Volts power supply to avoid the equipment tramming with the electrical power on. Mr Moussie will investigate this matter and provide feedback.

After the inspection, I sighted the maintenance records of the mobile equipment and they appeared to be up to date and we discussed the inclusion on the test sheets the 240 Volts

testing and tagging of appliances and verify the labelling has been attached to the right places.

As result of the inspection and discussions with the above mentioned persons, the following requires attention

Number	Substandard Condition or Practice	Due Date
1	**New tailing pumps equipment**	**15/11/2013**

The following requires attention on the new tailings pumps installation
1.- Both ends of the power cables feeding the motors require additional mechanical support
2.- At the motor connection box, the power cables were tool long and resting on the floor that is regularly mechanically cleaned with the potential damage to their insulation.
3.-The transparent protection in the VSD cubicles appeared to be too fragile and had gaps on their sides; which allow personnel to access exposed live parts.
4.- The new controls need suitable warning signs

Reference: Section 100 Selection and design and Section 106 Operating plant of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

Number	Substandard Condition or Practice	Due Date
2	**Commissioning forms and tests**	**15/11/2013**

The forms, tests and information being used during electrical project work have been developed for other purpose than commissioning.

Forms and test sheets have to be developed for formal electrical commissioning work as part of the overall Project Management Plan to ensure the plant equipment and control systems perform within their design specifications and the overall system is safe for use and fit for purpose and also they comply with the mining legislation, Australian Standards and site procedures. The documents to be developed must have provisions for recording all the relevant data of instruments being used (e.g. calibration date, type of instrument, etc).

Reference: Section 105 Commissioning of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

Number	Substandard Condition or Practice	Due Date
3	**Flammable spray cans in jumbo cabin**	**15/11/2013**

Several flammable spray cans were found inside the cabin of a jumbo creating the risk of fire and or explosions.

Jumbo operators have to be made aware of the consequences of having these flammable substances in the cabin; which create the risk of fire and or explosions. They should also be aware of their proper storage and handling to avoid their exposure to unacceptable levels of risk

Reference: Section 56 Storing and handling hazardous substances and dangerous goods of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

Number	Substandard Condition or Practice	Due Date
4	**Jumbos inspection and test sheets**	**15/11/2013**

It was found in the jumbos control enclosures that the labels of control devices were on the front of them or on the covers of cable trays that quite often are misplaced or missing, therefore

losing the identification labels. Also the 240 Volts appliances kept in the cabin (e.g. battery chargers, radio, etc) did not have test tags.

The forms currently being used for the regular inspections and tests of the jumbos have to be reviewed to ensure they contain all the information required to maintain the electrical devices and equipment safe for use and fit for purpose, such labels are on the right place, the electrical appliances are regularly tested and tagged, etc.

Reference: Section 109 Service and maintenance of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Sergio Cespedes
Inspector of Mines
Northern Region


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Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Sergio Cespedes, Inspector of Mines (Electrical)

Subject:	**Electrical**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	15/10/2013
Record Date:	17/10/2013	**MRE Item No.:**	1

Title: New tailing pumps equipment

Description of Action Required to be Taken:
The following requires attention on the new tailings pumps installation
1.- Both ends of the power cables feeding the motors require additional mechanical support
2.- At the motor connection box, the power cables were tool long and resting on the floor that is regularly mechanically cleaned with the potential damage to their insulation.
3.-The transparent protection in the VSD cubicles appeared to be too fragile and had gaps on their sides; which allow personnel to access exposed live parts.
4.- The new controls need suitable warning signs

Reference: Section 100 Selection and design and Section 106 Operating plant of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

References:
Section 100 Selection and design and Section 106 Operating plant of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 15/11/2013

Completed: 21/11/2013**, Closed by:** Sergio Cespedes **on** 21/11/2013 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

As per information attached to the MRE

Queensland Government

Mount Isa District Office
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Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Sergio Cespedes, Inspector of Mines (Electrical)

Subject:	**Commissioning of New Plant**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	15/10/2013
Record Date:	17/10/2013	**MRE Item No.:**	2

Title: Commissioning forms and tests

Description of Action Required to be Taken:
The forms, tests and information being used during electrical project work have been developed for other purpose than commissioning.

Forms and test sheets have to be developed for formal electrical commissioning work as part of the overall Project Management Plan to ensure the plant equipment and control systems perform within their design specifications and the overall system is safe for use and fit for purpose and also they comply with the mining legislation, Australian Standards and site procedures. The documents to be developed must have provisions for recording all the relevant data of instruments being used (e.g. calibration date, type of instrument, etc).

Reference: Section 105 Commissioning of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

References:
Section 105 Commissioning of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 15/11/2013

Completed: 21/11/2013**, Closed by:** Sergio Cespedes **on** 21/11/2013 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

As per information attached to the MRE

Queensland Government

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Sergio Cespedes, Inspector of Mines (Electrical)

Subject:	**Hazardous Substance**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	15/10/2013
Record Date:	17/10/2013	**MRE Item No.:**	3

Title: Flammable spray cans in jumbo cabin

Description of Action Required to be Taken:
Several flammable spray cans were found inside the cabin of a jumbo creating the risk of fire and or explosions.

Jumbo operators have to be made aware of the consequences of having these flammable substances in the cabin; which create the risk of fire and or explosions. They should also be aware of their proper storage and handling to avoid their exposure to unacceptable levels of risk

Reference: Section 56 Storing and handling hazardous substances and dangerous goods of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

References:
Section 56 Storing and handling hazardous substances and dangerous goods of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 15/11/2013

Completed: 08/11/2013**, Closed by:** Sergio Cespedes **on** 08/11/2013 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

As per information attached to the MRE

Queensland Government

Mount Isa District Office
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Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Sergio Cespedes, Inspector of Mines (Electrical)

Subject:	**Electrical Defects**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	15/10/2013
Record Date:	17/10/2013	**MRE Item No.:**	4

Title: Jumbos inspection and test sheets

Description of Action Required to be Taken:
It was found in the jumbos control enclosures that the labels of control devices were on the front of them or on the covers of cable trays that quite often are misplaced or missing, therefore losing the identification labels. Also the 240 Volts appliances kept in the cabin (e.g. battery chargers, radio, etc) did not have test tags.

The forms currently being used for the regular inspections and tests of the jumbos have to be reviewed to ensure they contain all the information required to maintain the electrical devices and equipment safe for use and fit for purpose, such labels are on the right place, the electrical appliances are regularly tested and tagged, etc.

Reference: Section 109 Service and maintenance of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

References:
Section 109 Service and maintenance of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 15/11/2013

Completed: 21/11/2013**, Closed by:** Sergio Cespedes **on** 21/11/2013 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

As per information attached to the MRE

Department of Natural Resources and Mines
Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	31/10/2012

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

Today and following emails from the site and the Mount Isa Senior Inspector of Explosives I came to inspect and discuss the technical and safety related matters associated with the 1000 Volts Charmec Charge Car. This mobile equipment is the first in the region designed to work connected to the mine electrical reticulation system for the transport of chemicals for the manufacturing of explosives at the faces being consequently charged.

On arrival I met Mr Stuart King, Mining Maintenance Superintendent, Mr Ashley Griffin, Development Services Superintendent and Mr Peter Fortington, Project Supervisor, who provided general details of the mobile manufacturing unit mounted on a Normet truck adapted as a charge car, which at that time was being used underground to charge development faces using only the mechanical features according to the approval given by the Explosives Inspectorate.

Then accompanied by Mr Griffin and Fortington I went underground to inspect the Charmec Charge Car at the 320 Level and the following it was observed:

1. The miners had already charged one of the two faces on the area
2. There were several emergency stop push-buttons around the equipment. These were of two types and one was yellow coloured and without clear labels of their specific functions
3. One of the man basket gates had the self-locking mechanism bent and was repaired by personnel soon after it was mentioned to them
4. A safety lanyard was attached to the man-basket with unsafe locking mechanism of the carabiners. This was taken away by Mr Fortington.
5. The Mobile Manufacturing Unit (MMU) is installed at the rear of the Normet truck and the rubber hose carrying the emulsion up to the semi-conductive hose used to pour the explosive into the charging holes installed on the man basket has been installed on top of the truck and suspended from brackets bolted to the machine. This seems to be a site modification and needs further consideration.
6. Copper straps were hanging under the engine bay and the rear of the Normet truck. The location of these straps cannot be seen properly when inspecting the equipment to ensure they are still fit for purpose.
7. The extra low voltage conductors were protected by a corrugated green plastic conduit

and these has to be verified for suitability with the working conditions of the equipment and environment.

8. The 28 kW, 1000 Volts electric motor driving the hydraulic pump that provide the energy for the charging functions of the charge car had the electrical power conductors protected by a black corrugated plastic conduit. This has to be also reviewed for suitability with the environment and operational conditions.
9. All the lights for work and travel were of LED type, therefore using extra low voltage and low currents.
10. The hydraulic jacks did not have earthing tails to achieve good earth continuity to the ground to discharge electrostatic or alternating stray currents.
11. The 1000 Volts trailing cable was a 35 mm2 type 441.1. which is suitable for this application, even when it is oversize..
12. Inside of the 1000 Volts control cubicle there were three plastic moulded circuit breakers without facilities for isolation and lockout.
13. It appears the fire suppression system does not cover the articulation area, where the hoses and electrical conductors are subjected to mechanical fatigue creating the risk of potential fires, keeping in mind the involvement of explosives during its normal use.
14. The use of mobile radio in the truck has to be reviewed to ensure its use it does not create an unacceptable level or risk when charging the faces and connecting the detonators for blasting.
15. Electrical detonators will not be allowed to be transported in the truck and it will be relied in administrative controls to manage these hazards.

Once back on surface we meet Mr Ed Cooney, Acting Site Senior Executive to give him feedback on the findings and some of them were:

- There was not evidence of the required risk assessment for the design to ensure it meets the requirements of the Mining and Quarrying Safety and Health Act 1999 and the Mining and Quarrying Safety and Health Regulations 2001, Australian Standards, site technical specifications and mining good engineering practices.
- Evidence of the project risk assessment was also not found.
- Some of the issues mentioned above were also explained.

Before leaving the site, Mr King provided some electronic information, which I will review during the next couple of weeks for further comments and input to the project.

As result of the inspection and discussions with the above mentioned persons, the following requires attention:

Number	Substandard Condition or Practice	Due Date
1	**Charmec charge car design risk assessment**	**22/01/2013**

In lieu of the findings, observations and discussions with site personnel, the design of the Charmec Charge Car has to be reviewed to demonstrate the hazards and risks are being properly managed, it complies with the requirements of the Mining and Quarrying Safety and Health Regulations 2001, all relevant Australian Standards, site technical specifications and good mining engineering practices.
Copy of the design review, risk assessment, Australian Standards and mining legislation compliance matrix has to be provided by the mentioned due time.
Reference: Part 3 Safety and Health Obligations of the Mining and Quarrying Safety and

Health Act 1999, Part 2, 4 and 10 of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

Number	Substandard Condition or Practice	Due Date
2	**Projects Management Plan**	**06/05/2013**

At the time of the inspection, the site did not have a formal and approved Projects Safety Management System or Plan to ensure the development and delivery of projects are in full compliance with the organisation standards, codes, procedures, technical specifications, Australian Standards, Mining and Quarrying Safety and Health Act 1999 and the Mining and Quarrying Safety and Health Regulation 2001 as amended.
A formal and approved Projects Safety Management System or Plan has to be developed and established to achieve full compliance with statutory requirements, site standards, codes and relevant Australian Standards.
Reference: Part 3 Safety and health obligations of the Mining and Quarrying Safety and Health Act 1999.

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Sergio Cespedes
Inspector of Mines
Northern Region


Cannington Mine - Mine Record Entry Response.msg MRE Cannington Mine 9748 02.htm

Queensland Government
Natural Resources, Mines and Water

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Sergio Cespedes, Inspector of Mines (Electrical)

Subject:	**Review hazard Controls**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	31/10/2012
Record Date:	04/11/2012	**MRE Item No.:**	1

Title: Charmec charge car design risk assessment

Description of Action Required to be Taken:
In lieu of the findings, observations and discussions with site personnel, the design of the Charmec Charge Car has to be reviewed to demonstrate the hazards and risks are being properly managed, it complies with the requirements of the Mining and Quarrying Safety and Health Regulations 2001, all relevant Australian Standards, site technical specifications and good mining engineering practices.
Copy of the design review, risk assessment, Australian Standards and mining legislation compliance matrix has to be provided by the mentioned due time.
Reference: Part 3 Safety and Health Obligations of the Mining and Quarrying Safety and Health Act 1999, Part 2, 4 and 10 of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

References:
Part 3 Safety and Health Obligations of the Mining and Quarrying Safety and Health Act 1999, Part 2, 4 and 10 of the Mining and Quarrying Safety and Health Regulation 2001 as amended.

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 22/01/2013

Completed: 18/02/2013**, Closed by:** Sergio Cespedes **on** 18/02/2013 12:00:00 AM.

Reassigned Due Date: 25/03/2013; **Review conducted by** Sergio Cespedes **on** 01/02/2013.

Action Taken by Mine to Comply with Corrective Action Requirement:

Unit burnt completely and use of 1000 V charge cars option has been discarded.

Queensland Government
Natural Resources, Mines and Water

Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Sergio Cespedes, Inspector of Mines (Electrical)

Subject:	**Management**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	31/10/2012
Record Date:	04/11/2012	**MRE Item No.:**	2

Title: Projects Management Plan

Description of Action Required to be Taken:
At the time of the inspection, the site did not have a formal and approved Projects Safety Management System or Plan to ensure the development and delivery of projects are in full compliance with the organisation standards, codes, procedures, technical specifications, Australian Standards, Mining and Quarrying Safety and Health Act 1999 and the Mining and Quarrying Safety and Health Regulation 2001 as amended.
A formal and approved Projects Safety Management System or Plan has to be developed and established to achieve full compliance with statutory requirements, site standards, codes and relevant Australian Standards.
Reference: Part 3 Safety and health obligations of the Mining and Quarrying Safety and Health Act 1999.

References:
Part 3 Safety and health obligations of the Mining and Quarrying Safety and Health Act 1999.

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 06/05/2013

Completed: 24/05/2013**, Closed by:** Sergio Cespedes **on** 24/05/2013 12:00:00 AM.

Reassigned Due Date: 25/06/2013; **Review conducted by** Sergio Cespedes **on** 20/05/2013.

Action Taken by Mine to Comply with Corrective Action Requirement:

As per information attached to the MRE

Department of Natural Resources and Mines
Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	26/06/2012

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

Today accompanied by Mr Witek Jablonski, Inspector of Mines (Mechanical), I came to inspect some of the surface electrical equipment and installations and also to introduce Mr Jablonski, our new member of the inspectorate to the mine site management team. On arrival we met Mr Stuart King, Acting Maintenance Manager to discuss the scope of our visit and make arrangements to discuss the progress of the proximity detection system implementation.

Then I met Mr Spencer Clark and Mr Mick Tenni, appointed persons to control electrical work for the surface areas subject of the inspection and together we went to inspect the following areas where the following it was observed:

Camp Gymnasium

1. The external main distribution board had a earth leakage circuit breaker labelled as Q1 and Q2 and being only one isolation switch
2. The single line drawing kept inside had drawn two circuit breakers and there was only one installed.
3. The incomer steel wire armoured cable did not have identification label as per site procedures
4. The isolation switches in the distribution board SB/A installed inside of the Gymnasium did not have facilities for isolation and lockout (ref. Section 27 of mining regulations) and the labelling of these devices was not clear. This issue was mentioned in my inspection report dated 06 May 2011 and still has not been properly addressed.
5. Another distribution board (SB/B) in the Gymnasium did not have facilities for effectiveness tests of the residual current devices protecting the lighting circuits and personnel have been removing the front cover to do the tests where there are exposed live parts.
6. There was a television installed on a wall and a power outlet at the bottom without conductors and meanwhile being fed using and extension lead hanging from the wall and also several walking machines with the cables on the floor and covered with worn out tape where personnel walk between the machines, exposing them to mechanical damage by stepping over.

Kiosk No. 1 High Voltage Cubicle

1. The switching devices had out of service tags dated 16/08/2009 indicating "do not switch, isolate at pole switch, low gas". The repair of this substandard condition is taking tool long, keeping in mind these devices are critical for the safety operation and maintenance of the power system (ref. Section 109 (3)) and that is the reason of their existence.
2. The Main 11 kV Feeder switch had an out of service tag attached to a scissor with two padlocks stating "no earth interlock with EDL Do not close earth" dated 29/11/11. In these two cases the use of the out of service tags does not meet the objective of the out of service procedure and these safety devices are critical for the safety of personnel and mainly the switch was live and NOT OUT OF SERVICE as indicated in the attached tag. The use of out of service tags with padlocks is not a conventional practice and it seems it is against the site safety procedures.
3. The high voltage (HV) switches have not been maintained or tested since their installation many years ago and there is not maintenance scheme for them in the maintenance system and some of the earth fault/earth leakage safety devices were not working.
4. The Camp not longer has the diesel generation back-up power supply in the event of failure of the power lines system to feed safety and critical equipment and installations, such as cold rooms, emergency equipment and facilities, etc

New Kitchen building

1. In the main distribution board, the main isolation switch did not have facility for isolation and lockout.
2. Several local isolation switches of the electrical machines and appliances were installed behind the equipment or located in a place without safe and easy access (ref. Section 27 of mining regulations).
3. The local isolators of the air conditioners and cold rooms fans on the external walls of the building were installed too high or on places without safe and easy access (ref. Section 27 or mining regulations)
4. I discussed with electricians working on the area about their responsibilities and duties required under their licences and relevant legislation associated with the quality and safety or electrical work, as they are personally legally liable under such certificates of competency.
5. I recommended to install equipotential bonding on all stainless steel benches where electrical appliances are normally used to improve the protection of personnel that regularly water clean and or use electrical equipment that some times fail with the potential of creating dangerous levels of touch potential.
6. The testing and tagging of electrical appliances and extension leads in the areas inspected were up to date.

Following the inspection, we met Mr King to provide feedback on the findings and we discussed matters such as:

- There have been some changes on the areas of responsibility of the appointed persons to control electrical work and the boundaries of these areas are not clear neither not well documented. This issue has to be formally solved as soon as possible
- As per the issues observed, it seems the current maintenance system and audit documents being used, are not providing for an effective management of the statutory requirements, compliance with Australian Standards and codes as per the established site management system.

- The electricians undertaking electrical work are not being able to notice and report basic substandard conditions on the electrical equipment and installations during maintenance and audit activities as per above mentioned issues.
- In sighting the commissioning information associated with the new kitchen building and facilities, some of it was missing and also some of the data appeared to be of a generic type (e.g. 200> Mohms) and not as it should be. The statutory information and records are not being collected or produced as required by the mining legislation (ref. Sections 20, 112 and 113 of the mining regulations. Please provide a copy of the commissioning report, including the punch list that is normally developed with the progress or completion of the items mentioned in it.
- The site has an Electrical Management Procedure, which contains the information for the management of electrical work on site and compliance with the mining legislation, standards and codes. It is expected this document to be kept current and or regularly reviewed and personnel is regularly made aware of its content for safe performance of electrical work.
- The technical specifications in place for the purchase and installation of electrical equipment and machinery are not reflected on the new kitchen facilities as per above mentioned issues. This issue needs to be assessed to find the gap that is allowing to have on site unsafe or substandard conditions on new electrical installations and or equipment.
- It is recognised that even when there have not been recently serious electrical incidents on site, still management has to develop an action plan to find the causes that are undermining the performance of electrical work on site, which create unsafe or substandard conditions with the potential of causing serious or fatal accidents on electrical equipment and installations.

Meanwhile I was inspecting the Camp areas, Mr Witek met Mr Tony Jacques, Fixed Plant Maintenance Superintendent and together went to the Concentrator Plant for a familiarisation visit and the following are his comments:

- The Plant was standing due to preparations to repair techtaylor valve
- Repairs were being carried out by two persons to split floats pump
- I sighted isolation locks and tags of this particular pump's circuit breaker in the substation
- I familiarized myself with preparedness for entire Plant in the Plant's Permit Room. Sighted log books as well as tags and locks which are used to record isolation and tagging of Plant equipment.
- I observed using of wheel chocks on parked service vehicle in the Plant
- I spoke in Plant's control room with Mr. Peter Wallace, Process Supervisor, on an issue related to work management process.
- Sighted in Mr. Tony Jacques office hard copies of job work orders with added comments from maintenance personnel upon completion of the task as well BHP's Cannington mine computerised maintenance system which is utilised by use of SAP software system.

Upon return to Mr. Jacques office, I met Mr. Shane Fielding, Project Superintendent, who updated me on the progress of the Proximity Detection System (PDS) project development for underground mobile equipment. During our discussion it was explained that:

- PDS-is still in the trial phase.
- Certain amount of mobile equipment has been fitted with outer zone protection only and inner zone is prepared but not installed yet.
- Project team is planning to go with outer system live next month

- Personal Alert Device (PAD) for cap lamps is not suitable due to firmware communication issues
- Project team prepared an updated presentation on progress of the project and it was made available to me.
- Mine Site Technologies is supplier of the hardware for PDS.

Number	Substandard Condition or Practice	Due Date
1	**Site electrical management**	**26/07/2012**

As per the number of issues found during the inspection of the electrical equipment and installations, the Site Senior Executive has to provide response to each of the matters mentioned in the body of the inspection report with clear indications of the actions and completion dates that must be undertaking to improve the safety and performance of the overall electrical work during the life cycle of the site.
Reference: Section 39 Obligations of site senior executive for mine of the Mining and Quarrying Safety and Health Act 1999.

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Sergio Cespedes
Inspector of Mines
Northern Region

Witek Jablonski
Inspector of Mines
Northern Region


DME Response 12-07-25.pdf

Queensland Government
Natural Resources, Mines and Water

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Vision: Our Industries Free of Safety and Health Incidents

Substandard Condition or Practice

Issued By: Sergio Cespedes, Inspector of Mines (Electrical)

Subject:	**Management**	**Mine ID:**	MI00094
Mine Name:	Cannington Mine	**Operator:**	BHP Billiton Minerals Pty Ltd
Activity:	Inspection	**Activity Date:**	26/06/2012
Record Date:	29/06/2012	**MRE Item No.:**	1

Title: Site electrical management

Description of Action Required to be Taken:
As per the number of issues found during the inspection of the electrical equipment and installations, the Site Senior Executive has to provide response to each of the matters mentioned in the body of the inspection report with clear indications of the actions and completion dates that must be undertaking to improve the safety and performance of the overall electrical work during the life cycle of the site.
Reference: Section 39 Obligations of site senior executive for mine of the Mining and Quarrying Safety and Health Act 1999.

References:
Section 39 Obligations of site senior executive for mine of the Mining and Quarrying Safety and Health Act 1999.

Risk to a person resulting from a hazard at the mine must be within acceptable limits at all times.

Reasonable Time for Compliance - Due Date: 26/07/2012

Completed: 27/07/2012**, Closed by:** Sergio Cespedes **on** 27/07/2012 12:00:00 AM.

Action Taken by Mine to Comply with Corrective Action Requirement:

As per information attached to the MRE

Queensland Government

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	05/02/2014

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Mine Record Entry

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Today I went to site in relation to the inspection of the underground fixed plant's mechanical equipment. I met Mr Glen Murphy, Underground Fixed Plant Supervisor and discussed with him scope of the inspection. Later and accompanied by Mr Murphy I went for the underground inspection.

The following was observed and inspected:

- At 600 level-jaw crusher chamber; personnel were engaged with replacing a broken bolt on the plate feeder. The crusher was isolated and a personal danger tag was placed on the local control unit. I also sighted inspection tag on the fire suppression system for hydraulic power pack dated; Dec-13. Mr Murphy said that fire suppression systems for hydraulic power packs are inspected each 3rd month by Chubb's contractors.

- At 605 level-collection ore area; the system consists of apron feeder, conveyor and magnet belt. Mr Murphy said that the primary function of the collection ore system is to remove all unwanted and scrap pieces of steel from the ore prior it going to the loading station. I noted a fire fighting system installed above conveyor belts. Mr Murphy said that the entire system is monitored all the time and the fire fighting system may be activated by personnel from Pitram control room, if required.

- At 570 level-loads out station; the system consists of apron feeder, diverter chute and east and west load out belt. Mr Murphy explained that ore is transported to this station from the collection ore area via the trunk conveyor belt. I observed that this system too had a fire fighting system installed above all the equipment. Mr Murphy stated that the fire fighting system is inspected and serviced by Chubb contractors each 3rd month and the inspection certificates are kept at the Maintenance Department.

- At 620 level-tail rope area; I observed personnel removing pieces of scrap steel from the vicinity of the shaft collar area. Upon completion the visual inspection of the tail ropes was carried out. Mr Murphy said that identifying signs of damage, kinks and other abnormalities of the tail ropes was the prime purpose of this inspection

During travelling underground with Mr Murphy; communication between heavy and light vehicles appeared to be adequate and radio calling referred to the specific equipment and

responded by the equipment identification and current location. Mr Murphy said that each person who is authorized to operate LV or mobile equipment has to complete training and assessment relating to the traffic management procedures. Records of assessments are kept in each person individual files on the site Ipick data base.

The underground roads appeared to be of acceptable standards and well maintained.

The areas which I inspected were not operating during my inspection. Mr Murphy said that the plants were on a planned weekly 6 hours shut down. He also said that planned weekly shutdowns are carried out on the underground plants as per rotating schedule which cycled through from 6 to 12 and 36 hours per week respectively.

In conclusion of my inspection it appears that adequate guards were in place in all areas which I inspected. It also appears that considerable effort has been made to maintain good housekeeping and that the maintenance of the fixed plant is effective and sound.

After completion of the underground inspection and prior leaving the site I met Mr Glen Loveday, Manager Maintenance and Mr Stuart King, Mining Maintenance Superintendent and gave them the feed back from the inspection.

Witek Jablonski
Inspector of Mines
Northern Region

Queensland Government

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	07/01/2014

Vision: Our Industries Free of Safety and Health Incidents

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On 07 and 08 January 2014 I attended site in relation to the inspection of the shaft and the maintenance processes of the rock hoist equipment and the shaft infrastructures.

On Tuesday I met Mr Glen Murphy , Underground Fixed Plant Supervisor and Mr Lance Gatty, Specialist Winding Operations and discussed with them scope of the inspection. Later I met Mr Brett Frischkorn, underground fitter and discussed with him aspects of his training and matters related to the Winder maintenance.

On Wednesday I met Mr Glen Murphy, Mr Heath Piggott, electrician and winder driver and Mr William Horsford, contract fitter from Dawson Engineering. Mr Murphy and Mr Horsford assisted me with the shaft inspection.

The following was undertaken:

Discussions in Mr Murphy office:

Risk management process in relation to maintenance of the Rock Hoist:

My discussion with, Mr Murphy and Mr Gatty centred around matters related to mine's risk management processes and how issues such as maintenance of Rock Hoist and the Shaft are referenced on the mines system. Mr Murphy said that the risk management process documentation is contained in the data base system titled: "Ipick". Mr Murphy demonstrated Ipick system which in essence is Cannington's internal based information access system and it consists 5 sections of internal information data base. Mr Murphy said that Ipick system is available to all maintenance personnel. I sighted Mr Murphy navigating his way to the sections of the Ipick he required such as:

- Sect. 1-Controlled documents.
- Sect. 2- Reference materials
- Sect. 3- Risk Management
- Sect. 4-HSEC management
- Sect. 5-ICANN

I noted that each of the above mentioned sections contained a list of relevant to risk management processes and tasks to be performed documents such as: maintenance procedures, Safety Work Instructions (SWI), OEM manuals, Risk register, JSAs, etc. It is my

understanding that hazards associated with shaft and winder operations have been identified during designing process and all documentation relating to it such as Risk Register sits on the above mentioned Ipick system. Mr Gatty said that identified risks which are included in the Risk Register have been used to develop a procedures required to operate shaft and the winder and to control risks associated with a particular tasks such as shaft, winder or head rope inspections.

I sighted the following documents on the Ipick relating to the shaft and hoist operation and maintenance processes:

- PRO-MNT0043-CAN-MAINT-PROCEDURE-WINDER- Operation & Management System. I noted that this document outlined the management system for the operation and maintenance of the automated winder at the Cannington Mine site. It also contain references to other procedures, training, SWI's, etc which were used in developing of this procedure. I noted that this procedure also include references relating to required national unit of competencies to operate the winder.
- Risk Register REG-cd 4035 dated Nov-2013
- PRO-HR0054-CAN-TRAINING-PROCEDURE-WINDER_Training.This procedure describes the process used to train winder drivers and personnel who perform maintenance tasks on the Winder at Cannington.

It is my understanding that Cannington Mine has also an overarching storage facility on the Intranet for all risk management processes documents titled:"Cannington Documentum Controlled Documents".

Further Mr Murphy explained that the SAP is used to control maintenance processes of the rock hoist and the shaft. In essence the maintenance system which sits on the site's SAP data base system is used to manage data flow information for the Rock Hoist and the Shaft in relation to such activities as: records keeping, planned inspections reminders, work orders printing, planned shut downs, audits reports, etc. Mr Murphy also said that the maintenance system automatically prints work orders and checklists for scheduled maintenance. Mr Gatty said that all signed hard copies of the work orders are scanned and entered back to the computer system upon completion of the maintenance tasks. Hard copies of completed work orders are stored in various files in the office.

I sighted the work order no: 422520762 dated 08/01 for weekly mechanical statutory inspection of winder and attachments. The following documents were also attached to this work order:

- SWI-MNT0527-Weekly Mechanical Head Rope, Tail Rope, Skip, Winder & Headframe Inspection
- CAN-MAINT-FORM-WINDER-Weekly Mechanical Head Rope, Tail Rope, Skip, Winder & Headframe Inspection FRM-cd 4506
- CANMAINTENANCE FORM WINDER-Inspect Rope for Damage, FRM-cd4089
- SWI-cd4029-CAN-MAINT-SWI-WINDER-Inspect Head Rope for Damage

I also discussed with Mr Gatty matters related to ropes inspections and Non Destructive Tests (NDT). He said that NDT on ropes are carried out for BHP by A.Noble&Son Ltd as per following intervals:

- Head ropes each 6 months
- Balance ropes each 12 months
- Guide ropes each 30 months.

I sighted A.Noble & Son LTD report: "Cannngton Mine Fowler Shaft, NDT testing Head Ropes" dated; 22/05/2013. I noted that results in this report of NDT carried out to head ropes

found ropes still fit for further use and they complied with AS 4812:2003 for ropes discard criteria.

Other matters related to maintenance of the winder and shaft discussed were as per following:

- Resources allocated and processes put in place to ensure the controls are implemented and sustained. Mr Murphy said that the site allocated a person who is currently reviewing all documentation relating to the Hoist and Shaft maintenance. He also said that Mr Gatty is the person appointed to control winding operations and his position is included in the management structure. Mr Gatty responsibility is contained in writing within description of the key position type for a person appointed to control winding operations.
- Information available on site regarding the operations and maintenance activities associated with the winder. Mr Murphy stated that it is included in relevant sections in the Ipick. I sighted in the Ipick sect. 2; CAN-MAINT-Manual Winde-2841.
- Integration of available information into the standard operating procedures. Mr Murphy said that the OEM manuals and other reasonable available relevant information were used in the developing of procedures or SWI for winders. I sighted that the Manual 2841 and MQSHR-2001 was referenced in the SWI-CAN-MAINT-Replace Winder brake actuators.
- Shaft emergency procedures. Mr Murphy said that the site have procedures and systems in place to manage a emergencies associated with hoist and shaft operations. These procedures sit on sect.1 on the Ipick. I sighted the following emergency procedures:
    1. CAN-MAINT-SWI-WINDER-Coordinate Mine evacuation via Shaft
    2. CAN-MAINT-SWI-WINDER-Emergency Evacuation of Winder Tower.

After discussion with Mr Murphy and Getty I met Mr Frischkorn and discussed with him matters relating to winder and shaft operating practices such as:

- Procedures used for cage loading and shaft and hoisting maintenance tasks. Mr Frischkorn said that maintenance personnel have access on the Ipick to all SWI's or Procedures covering the risk associated with the above mentioned tasks and practices.
- Winder signalling and communication. Mr Frischkorn said that the radio and, in emergency, knocker system is used during inspections or repairs carried out in the shaft.
- Training provided for the operational and maintenance personnel. Mr Frischkorn said that he completed internal training titled: "pass out access-the winder maintenance".

Supervision and planned maintenance. Mr Frischkorn said that the site is using planned maintenance procedures to carry out regular inspections and maintenance of the equipment to ensure that it is fit for use. Planned maintenance of winder and shaft includes daily, weekly, monthly, 6 monthly and yearly inspections of various areas of the equipment. He also said the quality and accuracy of inspections and tasks are ascertained by following of procedures and regular over inspections carried out by the supervisor.

Main winder inspection:

I observed the following:

Preparation on the Headgear's level 2 to the weekly shaft inspection which included the following:

- checking of radio communication with the winder driver, completing of take five with Mr Horsford

- cleaning of sky shaft collar from rock and loose material, skips and greasing of the guide ropes
- visual head rope inspection

Mr Murphy said that maintenance personnel are following procedures developed for weekly shaft inspection. I sighted the following documents which were used during this shaft inspection:

- SWI-MNT 0102C-Shaft Inspection
- JSA 000702 CAN-MAINT-Job Safety Analysis-Cleaning
- SWI-MNT 0103C-CAN-SWI-MAINT-Winder-Shaft Inspection
- JSA 000703 CAN-MAINT-Job Safety Analysis-Winder Shaft Inspection
- SWI-MNT-0527-Winder mechanical inspection

Visual shaft inspection which included the following :

- Shaft lining. I did not observe significant cracks of the shaft lining during time of my inspection.
- Wall brackets
- Pipe work
- Electrical cables
- Cable wedges
- Guide ropes. It appears that they were well greased.
- Fixed guides
- Salt scale build-up. I did not observe excessive accumulation of scale build up on the shaft barrel during time of my inspection. Mr Murphy said that current scale build up in the shaft barrel is controlled by the site with regular monitoring of it and removing scale with the power washing.

Visual inspection of the following equipment at Headgear's level 4:

- winder's brakes pump number 1 and 2.
- previously detected during NDT inspections damaged areas on head ropes number 2-East and West side. The damages appeared still to be within the limit.

Visual inspection of the following equipment at Headgear's level 5:

- callipers
- head rope drum
- greasing points

Mr Murphy stated that the above mentioned equipment is inspected for abnormalities as per inspection checklists. Mr Murphy also pointed out areas where annual recommissioning of the winder equipment was carried out.

Upon completion of the inspection we went to the Winder room at the Headgear's level 5 where Mr Murphy signed Winder Record Book and Winder Shaft Report book.

It was pleasing to observe good standards of housekeeping processes on site during time of my inspection of the shaft and the winder. It appears from my observations and inspections that maintenance of the shaft and the winder equipment is conducted efficiently and professionally.

After the inspection of the shaft Mr Murphy escorted me to office of Mr Glen Loveday, Manager Maintenance for a close out meeting where I stated my observations.

Witek Jablonski
Inspector of Mines
Northern Region

Queensland Government

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	09/07/2013

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

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On 09 and 10 July 2013 I attended site to undertake an inspection of the mechanical equipment and installation and also discuss the maintenance practices and management of contractors on site during the outage.

On Tuesday 09 July 2013 I held an initial meeting with Mr Troy Wilson, Site Senior Executive to explain the scope of the inspection. I than met Mr Glen Loveday, Manager Maintenance and Mr Jason Lindley, Surface Maintenance Superintendent and discussed a schedule for my inspection. I also met Mr Collin Barrett, Senior Planner who gave me an update on BHP's Contractor Management processes in relation to current shutdown of the Surface Process Plant. Later I attended a shutdown supervisors meeting with Mr Lindley who also escorted me to the Surface Process Plant for inspection and observation of activities.

On Wednesday 10 July 2013 I met Mr Loveday, Mr Darren Reid, Mobile Maintenance Superintendent and Mr Rod Gilliand, Safety Specialist to discuss matters related to the shutdown inspection and charge car basket collapse incident, dated 14/03/2012.

The following was undertaken:

Senior Planner Office:

My discussions with Mr Barret centred on the following topics:

- The current activities on site by contractors. Mr Barret stated that contractors are currently completing shutdown of Surface Process Plant and he provided details of the contractors involved in the shutdown.
- System for selection and management of contractors. Mr Barret explained to me that the site has a Contractor Management Procedures to provide site's requirements and evaluate possible contractors for such tasks like outages. Such procedures are located on site's "Ipic"; electronic document depository system. I sighted PRO-cd 4227-CAN-HSEC-Procedure-Contractor Management.
- Contractor's compliance with site's Safety and Health Management System (SHMS) in relation to the work undertaken by the contractor. Mr Barret stated that the site has procedures located on "Ipic" to ensure that contractors comply with site's SHMS. Site's outage planning process identifies labour requirements to engage specific contractors for the task. I sighted Procedure PRO-SAF0031, CAN-NPI Procedure-Asset Protection-Site Access. In essence this particular procedure is designed to ensure that all permanent employees, casual employees, contractors, consultants and visitors

have met the applicable competencies and medical standards. It also describes how the site's requirements must be met. One of the document referenced in the PRO-SAF0031 procedure is the CAN-HR-FORM-Contract Partner Pre-Induction Checklist ASSES0183C which is designed to ensure that all site's mandatory requirements related to pre-employment such as: medical, training, competencies and other records are approved by the site prior issuing Site Access Card to the employee or contractor. All the above mentioned records are kept in the Training Department.

- System on site to make sure that procedures and SWI's used on site by contractors have been reviewed and approved by the SSE. Mr Barret stated that only site's procedures or Job Safety Analysis; (JSA) formats are accepted on site. Each contractor is trained and assessed on site for practical use of BHP's JSA. Site has the Manual-JSA workbook for training of each employee and contractor to attain the competency in using JSA. I sighted CAN-Mining -Assessment-Job Safety Analysis ASSES-2811 form which in essence is an assessment tool to assess skills and knowledge of the participant that he has achieved competency in using of JSA in the workplace.
- System on site to ensure that plant and equipment brought to site by contractor is fit for the intended purpose. Mr Barret stated that site followed a guidance from the corporate GLD.010-Fatal Risk Controls to develop site specific standards to ensure that equipment brought by contractor to site comply with GLD. 010. Site has developed set of checklist to ensure that equipment and plant brought to site by contractors comply with site specific and GLD. O10 standards. I sighted CAN Maintenance Form-Cannington. Miscellaneous Equipment Site Compliance Checklist-Bobcats, Forklifts, Buggies, EWP, Scissor Lifts, Tractors.
- Supervision of contractors on site during outage. Mr Barret stated that the site has developed an organogram which include selected and appointed supervisor for managing of contractors on site. The site's supervisor's duties in relation to managing of contractors on site include but not limited to conducting of scheduled checks, checking if contractor's equipment is maintained as per site's maintenance strategy and requirements etc. Other processes of supervising of contractors on site include regular daily meetings with contractors, safety meeting etc. I sighted the following:
    1. CAN-HSEC-Form-Notice of appointment- Supervisor TRF-7452. This form has a reference to MQSHA S.23 "Appointment of Supervisor".
    2. BHPB Cannington Mine March 2013 Surface Outage organogram "15 to 21 March 2013" It included line of supervision between the site and contractors supervisors in relation to the outage.

Surface Process Plant inspection:

At outage site I inspected various areas where I observed activities of contractors and inspected the mechanical equipment and installations. During my inspection I also meet personnel working for various contractors.

- Mr Garry Warry, Fenner and Dunlop's fitter and turner and Mr Greg Adams, Fenner and Dunlop's boilermaker. Mr Warry and Mr Adams explained to me that prior starting on site they had to complete general and JSA site inductions and were later assessed if they achieved competency of using of site's JSA at working place. General induction included also verification of their competencies, assessments of their medical capabilities and taking blood samples for "lead test".
- I observed Pacific Reliners Contractors repairing skirtings and wear plates of the primary feeders. I noticed that contractors were using Lincoln Electric diesel welders. Both of the welders were equipped with the Voltage Reduction Devices. I also noticed BHP equipment assessment stickers on the welders dated 04/087/13.
- At the Grinding area I observed lifting of scaffolding carried out by North West Crane

Hire. I held a short discussion related to lifting procedures with Mr Sam Doxford, supervisor.

- At the flotation area I met Mr Brendan Rolt, Dawson's contractor supervisor and observed activity of Dawsons Contractors related to replacing of agitator supporting beams. I noticed that all workers had full body harness on them and those who had to go down the ladder to the floatation tanks had their full body harness attached to the horizontal line, installed above the opening, via Sala blocks. In essence, workers had to travel approximately 5 metres down the ladder to the bottom of the tank from the platform where they were working. There was also an opening in the platform to allow the access to the bottom of the tank and to replace the beams. I raised the issue with Mr Lindley of practicality and effectiveness of the fall arresting arrangements. In my opinion flexibility of the horizontal line, to which Sala blocks were attached would greatly delay the time of reaction of this device. I also noted that, a person would have collided either with the ladder or a wall of the tank if accidentally falling from working platform to the tank before Sala block activates to arrest the fall. Mr Lindley stated that the fall arrest arrangement are as per Working on Height practices.

It appears that considerable effort has been made to maintain good housekeeping during the outage in the Surface Processing Plant. Additionally it also appears that the planning of the outage and supervising of contractors on site is up to the site requirements.

Matters discussed at Mr Loveday office:

- Management of contractors during the outage of Surface Processing Plant.
- Fall arresting arrangements at the flotation area. Our discussion on the matter focused on practicality and effectiveness of the fall arrest practices which I observed during my inspection at the Plant's flotation area. In that Sala blocks were hooked onto horizontal line installed above the opening and the workers were attaching their harnesses onto them when it was required. In essence, Sala block is inertia reel type 2 fall-arrestors device. This type of device is generally attached to anchorage point and pays out a line which is attached to the user's harness. Under fall arrest conditions the reel locks by means of the inertia-reel or similar mechanical principle. Some matters relating to type 2 device which need to be taken into account in the selection of fall-arrest device are as follows:

    1. The device should be anchored to a point above the user which will not be offset by generally more than 30 degree from the vertical or such other angle specified by the manufacture.
    2. The angle should be reduced where the height of the device above the user is enough for the person to fall into an uncontrolled swing and possibly be injured by striking a structure or coming to rest after the swing, in a position that would make rescue difficult or impossible. I noticed during my inspection at the Plant that attaching Sala block into the horizontal line, but not to the fixed anchored point could add more delay to activate the arrest mechanism of the device during the accidental fall.
    3. I assume that personnel were attaching their harnesses to Sala block while working either on the platform but around the opening or when walking down the ladder to the bottom of the tank to assist with replacement of the beams. In that the anchorage lines of Sala blocks were extended for some time when the workers were at the bottom of the tank. Anchorage lines should, however and as far as practicable, not left extended when not in use as this ma expose the line to dirt and corrosion and will stress the retractor spring.

In conclusion of this matter I recommend that the practice of installing of Sala blocks to the flexible horizontal lines as fall preventive arrangements in this particular situation is risk

assessed and reviewed and more effective and practical controls to prevent fall of personnel when working on heights and in such arrangements are considered. Reference should be given to AS/NZS 1891.4; 2009; “Industrial fall-arrest systems and devices. Part 4: Selection, use and maintenance”.

- Corrective arrangements to prevent reoccurrence of charge car basket collapse incident dated 14/03/2012. Mr Reid stated that the incident was caused when the barrel end of basket cylinder cracked. In order to improve monitoring of welding joints and prevent reoccurring of the incident site has added to the service sheets of charge cars and daily pre-start sheets visual inspections of weld areas of slew mounts and mount frame of the tilt cylinder mount. Additionally to it, visual inspections are also carried out during planned maintenance for cracks and wear of all boom tubes welded areas. I sighted: CAN-Maint-Form-Mobile Maint-Normet Charmec MC605DV 500 hr service FRM-cd4577 and Mobile Equipment Pre-start inspection Charmec Explosive carrier FMR-cd 4657 and noticed the above mentioned additional visual inspection of welds, are included in the service and check sheet.

Witek Jablonski
Inspector of Mines
Northern Region

Department of Natural Resources and Mines
Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	12/02/2013

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Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

Today I went to site in relation to the Rock Hoist weekly shaft inspection. I initially met Mr Stuart King, Mining Fixed Plant Maintenance Superintendent, and attended the daily pre-start meeting with the mining maintenance team during which I also met Mr John Wright, Mining Fixed Plant Mechanical Supervisor. Mr King explained that purpose of the meeting is to discuss safety in a number of areas such as: “take five” or safety observations in general.

The safety improvements, hazard identification, and work to be completed or already completed is also discussed. Mr King also stated that the pre-start meeting is an opportunity for supervisors to hand out, work packs including Safety Work Instructions, Work Orders, Inspection Checklists with Original Equipment Manufacturers info attached to it to workers.

The pre-start meeting usually ends up with stretching exercises which help participants their fitness to work.

After the meeting, I observed personnel preparing for group isolation of the underground off-load station equipment. Mr King explained that group isolation is carried out by the authorized electricians. They isolate particular equipment and upon completion of the isolation, they place the keys inside the lock-out box and lock it with the master lock. Further, personnel who work on isolated equipment also put their locks on the lock-out box.

Only upon completion of the task and when all personal locks are removed, authorised electricians may unlock the lock-out box and unlock listed equipment with the keys removed from the lock-out box. The group isolation includes permits to work and certificates which are attached to the lock-out box. Mr King also stated that the group isolation process is in line with the site lock-out procedure.

Shaft inspection:

I was accompanied during the shaft inspection by Mr Tim Williscroft, Fitter and Mr Brenton Gibson, Instrumentation Apprentice. The shaft inspection was preceded with completion of the inspection of the head frame, skips, visual inspection of ropes, conveyance attachments and winder components at level 5 of the head frame with the use of the CAN-Maint-Form-weekly mechanical head rope, tail rope, skip winder and head frame inspection checklist .

Mr Williscroft explained that if there is any issue found during the inspection, it is recorded on the checklist for further action. If it is critical then it rates immediate attention. Upon completion of the head frame and winder components inspection we went into the skip’s inspection

basket to start the shaft inspection. This is done with the use of the CAN-Maint-SWI-Winder Shaft Inspection checklist. The following were observed:

- Preparation for shaft inspection level including completion and signing of relevant forms.
- Services in the shaft, such as cable and pipes which, appeared to be in good condition.
- Rope guides which appeared to be well lubricated and in good condition
- Slight build up of salt deposits on the shaft barrel walls at various places in the shaft.

It was pleasing to see that structures in the shaft, including shaft concrete lining appeared to be in reasonably good condition.

Upon completion of the shaft inspection the crew signed off the weekly shaft inspection checklist which included comments.

On completion of the shaft inspection, I met Mr Shane Fielding, Project Superintendent, who updated me on the progress of the Proximity Detection Device System,(PDDS) This is being developed for mobile equipment. Mr Fielding stated that the planned completion of the inner zone equipment installation for all mobile equipment has been delayed by Mine Site Technologies as they are still waiting for the hardware. He also informed me that the site intention is to screen off the crib room at level 450 underground. It is too close to the decline shaft. The signals from cap lamp tags in the crib room are causing too many nuisance signals in the mobile equipment cabin.

Before leaving the site I discussed the findings of the inspection with Troy Wilson, General Manager Operations and Mr King.

Witek Jablonski
Inspector of Mines
Northern Region

Department of Natural Resources and Mines
Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Cannington Mine	MI00094	BHP Billiton Minerals Pty Ltd	Inspection	Northern	20/11/2012

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Mine Record Entry

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On 20, 21 and 22 November 2012 I attended site.

On Tuesday 20 November 2012 I held an initial meeting with Mr Ed Cooney – BHP Manager Mining. After the meeting I met Mr Glen Loveday-BHP Manager Maintenance to discuss a schedule for my three days of inspections. We then dispersed and I met Mr Shane Fielding-Project Superintendent, who updated me on the progress of the Proximity Detection System,(PDS) project development for mobile equipment. I also met Mr Mick Lenz-Redpath Manager Maintenance who gave me an update on Planned Maintenance System of Redpath's mobile equipment. We also discussed recent incident (15-November-2012) of R2900 Cat Loader Plant Number 03130 when its rear wheel came off while travelling down the decline.

On Wednesday 21 November 2012 I met Mr Mark Weaver-Redpath Maintenance Manager and Mr Darren Reid-BHP Mobile Maintenance Superintendent and continued discussions on mobile plants Planned Maintenance Systems. I also met Mr Michael Benson-BHP Mining Training Supervisor and discussed with him training package for mobile plant operators. Later this day I meet Mr Nathan Horn-BHP underground mobile plant operator and discussed with him matters related to his training and pre-start checks.

On Thursday 22 November 2012 I met Mr Lance Getty-BHP Electrical systems technician in control of winding operations and discussed with him matters related to winders planned maintenance system. He also escorted me to the shaft for winder inspection.

Before leaving the site I discussed the findings of the inspection with Mr Troy Wilson-BHP General Manager Operations. It was agreed that he will review MRE findings with the view to improve their system.

Proximity Detection Device:

During my discussion with Mr Fielding it was explained that:

- Mine Site Technologies (MST) are developers and suppliers of inner and outer zone PDS technology
- All mobile equipment outer zone detection system has been fitted with dual generator and it is fully operational now. It works on radio frequency identification within approximately 100 metres distance.

- Personal Alert Device (PAD) for cap lamps is now working in the outer zone.
- There are several validation points installed on the site for mobile plants and personnel. Validation points are installed to visually show the operator that his/her machine or cap lamp tag is detectable by the mobile fleet.
- PDS inner zone is currently under review. MST doesn't have adequate firmware to activate it. Inner zone, when commissioned will be able to identify any object within 30 metres radius of mobile equipment. It will be using magnetic field identification technology.

Redpath-mobile equipment workshop.

I met with Mr Lenz and Mr Weaver in their office. They gave me an overview on Redpath function at Cannington Mine. My discussions with them related to maintenance systems and flow of documentations within Redpath's Mobile Equipment Workshop. We also discussed recent incident with CAT Loader R2900-unit number 03130.It was explained that Redpath uses Lotus Notes to manage Maintenance Manager System which in essence is a Main Data Base to run interlinked programmes used for operations of Redpath for BHP. These are as per following:

1. Purchases
2. Assets register
3. Scheduling
4. Training
5. Hazard reporting
6. Incident reporting
7. Risk assessments, etc.

Mr Weaver stated that Redpath follows up BHP's Safety Work Instructions (SWI). They are located on BHP Ipick data base and Redpath is able to access them if required.

I sighted the following:

- SWI-cd 4163-CAN-MAINT-SWI-Removal and fitting of LHD R2900G wheel assembly. I noted in the text of this SWI point 13 in "steps" related to placing of information tag on controls after replacement of wheel assembly. This step is also related to the incident as discussed below.
- Files for each individual machine which included hard copies of work orders, daily brake tests, and daily pre-start checks etc.
- File for CAT loader R2900 number 03130 which included:
    1. Annual Safety check for CAT R2900 unit number 03130 dated 18-10-2012
    2. Work order for 250 hours planned maintenance dated 11-November-2012.I noted t entry from service man in it that rear wheel was replaced and nuts need to be re torque after 4 hrs of service. Mr Lenz said that information tag was also placed on the joy stick in the cabin with same comment but it appears that it got lost during change of the shifts prior the incident.
    3. Weekly service work order dated 15-11-2012
    4. Daily pre-start check dated 14-November-2012

I noted that Redpath daily pre-start checklist appeared to be of generic in nature. It didn't have criticality list and it was different from BHP checklist. Mr Weaver stated that current daily pre-start checklist has been modified to meet BHP standards and Redpath is currently implementing newly formatted daily pre-start checklist for CAT (R) 2900 G loader. I sighted

new daily pre-start checklist which appears to meet BHP standard for daily CAT R2900 daily pre-start checklist but it doesn't describe clearly what operators must identify when checking some parts of the loader ex:"in category 2 column -wheel nuts". It appears to be a statement but not a checking question.

I also raised an issue of documenting of an authorisation from Maintenance Supervisor when identifying in the new pre-start check sheet that a part of machine has a category 2 degree of criticality. I assumed that it has to be written authorisation as there is a space for a Supervisor signature on the pre-start checklist.

BHP- mobile equipment workshop.

I met with Mr Benson in his office. He gave me an overview on maintenance systems and flow of documentations within BHP's Mobile Equipment Workshop. Mr Reed said that BHP uses SAP programme to manage Ipick Controlled Document Interface System which in essence is a Main Data Base to store variety of documents. I observed Mr Reed navigating his way to the areas of Ipick he required such as SWI, Planned maintenance schedules, Job Safety Analysis forms etc. I sighted daily pre-start checklist for R2900G/R1700G loader. I raised an issue that after identification of cat 2 item in the pre-start check sheet there is no method of documenting approval by the Maintenance Superintendent. It remains unclear what authorisation from a Supervisor going to be acceptable as there is only a space for an Operator signature on the pre-start checklist for this particular mobile Plant.

BHP-mining training office.

I met with Mr Benson in his office. He gave me an overview on training process for mobile plant operators. He said that each BHP or Redpath mobile plant operator needs to successfully complete 13 modules of Haul Truck Training which include self assessment prior to continue with practical training which involves operating of the equipment with competent driver. My discussions with Mr Benson centred on operator training modules related to pre-start checklist assessments for CAT R2900G loader.

I sighted the following:

- Copy of training Plan LHD Operations. I noted in self-assessment portion of the Training Plan question related to pre-start checking of wheels/tyres.
- Copy of Practical assessment of competency of the operator. I noted that it includes assessment of the operator on how he prepares loader and what he has to look when checking wheels/tyres. I noted that the expected correct answer to it shall be:
    1. Wheel nuts missing or loose
    2. Tyres-inflation/wear /damage
    3. Missing locking lugs
    4. Leaks from hubs.

Pre-start check of R2900G loader no:03130

I met Mr Horn at the loader and discussed with him matters related to daily pre-start checks of the loader. He demonstrated to me how he conducts pre-start check of the loader prior starting of the shift. He stated that he received training for mobile plant operator when he joined BHP 1.5 year ago. He stated that 3 missing wheels nuts are critical criteria for safe operation of the loader. He also said that all information tags are now attached to the ignition keys of the mobile equipment. It is one of the preventive measures adopted by the mine after completion of investigation to the incident with rear wheel of the loader.

I sighted the following:

- Daily pre-start check sheet dated 21/11/2012

- Info tag dated 21/11/2012 and attached to ignition key of CAT R2900G loader number 115 with a note to retention all wheels nuts after 4 hours operating following wheels change.

Main winder inspection.

I met Mr Gatty in his office. He gave me an overview on Planned Maintenance (PM) system for Rock Winder. He said that PM system for the winder is located on BHP SAP Data Base for Winders. It automatically prints work orders and checklists for scheduled maintenance. All work orders are scanned and entered back to the computer system upon completion of the maintenance tasks. Hard copies of completed work orders are stored in various files in the office.). Mr Getty said that mine intends to install: "ropes continuous monitor system" in the winder's head gear. It will continuously monitor ropes lay length and diameter. Trials of the system should start during first half of the next year. I also discussed with Mr Gatty matters related to ropes inspections and Non Destructive Tests (NDT). He said that NDT on ropes are carried out for BHP by A.Noble&Son Ltd as per following intervals:

-Head ropes each 6 months

-Balance ropes each 12 months

- Guide ropes each 30 months.

I sighted the following:

- SWI –MNT 0103C-Shaft inspection
- SWI MNT 0102C-Clean sky shaft collar and skip before shaft inspection
- Weekly shaft inspection check list dated 30-10-2012
- Results of NDT carried out to head ropes on 31/05/2012
- Results of NDT carried out to guide ropes during march-2012. All reports found ropes still fit for further use. A.Nobles&Son uses AS 4812:2003 for ropes discard criteria

Matters discussed during close up meeting:

1. Review of SWI:

Mine needs to review SWI-cd 4163-CAN-MAINT-SWI-"Removal and fitting of LHD R2900G wheel assembly" to reflect change in placing of information tag after fitting of wheel assembly. I noted in the text of this SWI point 13 in "steps" related to placing of information tags on controls after replacement of wheel assembly. The use of term "controls" is ambiguous. I was informed that one of preventive measures adopted by the mine after the incident was to change from placing of information tags on controls to attaching them to the ignition key of the mobile equipment. The change in practice should be reflected in the SWI.

2. Review of training package for mobile plant operators.

Mine needs to review training package for mobile plant operators to adopt changes in SWI-cd 4163-CAN-MAINT-SWI-"Removal and fitting of LHD R2900G wheel assembly" related to placing of information tags.

3. Pre start check sheet for CAT R2900R Loader:

I noted that Redpath daily pre-start checklist appeared to be generic in nature. It didn't have criticality list and it was different from BHP checklist. Mine should ensure that contractors use similar check sheets which are already used on site.

Daily pre-start checklist for R2900G/R1700G loader used by BHP is comprehensive and have category list to determine serviceability of the equipment. However BHP check list have an issue in the pre-start check sheet that after identification of cat 2 item in the pre-start check sheet there is no method of documenting approval by the Maintenance Superintendent. Mine needs to clarify the ambiguity related to documenting the authorisation from Maintenance

Supervisor.

Witek Jablonski
Inspector of Mines
Northern Region