APPENDIX 6
WORKPLACE HEALTH AND SAFETY

A6 APPENDIX 6 WORKPLACE HEALTH AND SAFETY

A6.1 Occupational Hygiene Issues Related to the Management of the Capped Waste Stockpile at Kurri Kurri Smelter

Banksia EOHS
Occupational, Environmental and Community Health Risk

14 Richmond Vale Road
Mulbring NSW 2323
Phone: (02) 49380044
Fax: (02) 4938 0111
Mobile: 0416070709
Email: jimorr1@bigpond.com

11th September 2017.

The Manager,
Hydro Aluminium Kurri Kurri,
P.O. Box 1,
Kurri Kurri. NSW. 2327.

Attention: Mr. Andrew Walker.

Re: Occupational Hygiene Issues Related To The Management Of The Capped Waste Stockpile At Kurri Kurri Smelter.

Dear Andrew,

Further to our meeting today regarding management of the Capped Waste Stockpile and the occupational hygiene issues the wastes pose, we have the following comments/observations:

1. Nature Of The Contaminants Of Concern In The Capped Waste Stockpile.

a. Characterisation of the waste has identified a number of contaminants including two having occupational hygiene significance – friable asbestos and high molecular weight PAH's (including Benzo a Pyrene). Both these wastes have significance in determining the ways in which the waste can be processed, transported, handled and disposed of.

2. Regulatory Status.

The regulatory framework in New South Wales sets the boundaries inside which the processing of the waste must be carried out. The significant sections of the WHS Regulations relevant to the treatment of the waste include:

a. The NSW WHS Regulations do not allow the processing of asbestos materials.
   i. Under Chapter 8, Part 8.1, Clause 419(1) of the WHS Regulations a person conducting a business or undertaking must not carry out or direct or allow a worker to carry out, work involving asbestos.
   ii. Under Clause 419(2), "involving" is defined as the work of manufacturing, supplying, transporting, storing, removing, using, installing, handling, treating, disposing of or disturbing asbestos or ACM.

b. It was suggested at the meeting that processing of the Capped Stockpile Waste could involve the use of high pressure water blasting or compressed air blasting. The NSW WHS Regulations do not allow the use of high pressure water blasters or compressed air blasters for the purpose of cleaning asbestos containing materials.

   Under Chapter 8, Part 8.5, Division 3, Clause 446(1), the Regulations prohibit the use on asbestos or ACM of:
   i. High-pressure water sprays,
   ii. Compressed air.
   iii. Clause 446(3) also prohibits the use (unless the equipment is controlled) of power tools, brooms or any other implement that cause the release of airborne asbestos into the atmosphere.

c. The restrictions contained in Clauses 419(1), 419(2), 446(1) and 446 (3) limit the scope of processes which can be used if decontamination through cleaning of waste to remove asbestos is planned, and preclude the use of certain procedures.

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3. Contaminants of Concern.

a. Two of the contaminants of concern in the waste from an Occupational Hygiene perspective include:

   i. Friable Asbestos,
   ii. High molecular weight PAH compounds including B(a)P.

b. Friable asbestos is an A1 carcinogen and is the contaminant which controls the procedures and processes put in place to protect worker health.

c. Benzo(a)Pyrene is a high molecular weight PAH compound, it is an A1 carcinogen, and has a boiling point of around 360^{o}C. Because of its boiling point, it is not present in a volatile form – it is present in a particulate form at room temperature in the workplace.

4. Work Methods/PPE.

Contaminants in the Capped Waste Stockpile dictate the procedures, work methods and the PPE used in handling the material. A detailed assessment of waste handling options and PPE standards will be required prior to the commencement of the Capped Waste Stockpile remediation, but some general guidelines can be outlined:

a. Both asbestos and high molecular weight PAH compounds will be present as particulates in any workplace where Capped Waste Stockpile materials are being handled.

b. To control personal exposure (and environmental disturbance), in general terms, if the emission of dust is controlled (for example by mist sprays), the personal exposure will be minimized. Dust control will reduce the potential for inhalation (Asbestos and PAH) and dermal uptake (PAH's) of the contaminants.

c. PPE requirements will include respiratory protection (level to be defined), dermal uptake protection – suits and gloves.

d. Decontamination processes will be required.

5. Asbestos Contractor.

a. Because of the presence of friable asbestos, a Class A Licenced asbestos removal contractor will be required.

b. The asbestos removal contractor will prepare a Work Method Statement and obtain all necessary permits and approvals for the work to proceed.

6. Air Monitoring, Clearance & Supervision.

a. Air monitoring for asbestos will be required during the relocation of the waste material. For asbestos, this will be undertaken in accordance with the NOHSC Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibers [NOHSC:3003 (2005)]. The control and action levels will be as follows:

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Action Level	Control	Action
<0.01 fibers/mL	No new control measures are necessary	Continue with control measures.
>0.01 ≤0.02 fibers/mL	Review	Review control measures
	Investigate	Investigate the cause
	Implement	Implement controls to eliminate or minimize exposure and prevent further release.
>0.02 fibers/mL	Stop removal work	Stop removal work
	Notify regulator	Notify the regulator formally by fax or written statement that work has ceased and forward the results of the air monitoring.
	Investigate the cause	Conduct a thorough visual inspection of the enclosure if used and associated equipment in consultation with all workers involved with the removal work.
	Implement controls to eliminate or minimize exposure and prevent further release.	Extend the isolation/barricaded area around the removal area as far as reasonably practicable. Wet wipe and vacuum the surrounding area. Smoke test the enclosure until it is satisfactorily sealed.
	Do not commence further removal work until further air monitoring is conducted.	Do not recommence until fibre levels are <0.01 fibre/mL.

b. Air monitoring for PAH's will be undertaken in accordance with NIOSH Method 5506 and Australian Standard 3540:1989. Personal sampling pumps will be used, calibrated both prior to and following sampling runs using a soap bubble calibration unit and a field rotameter. NIOSH Method 5506 utilises a prefilter to collect aerosols and a charcoal sorbent tube to collect Benzene and volatile PAH compounds.

7. Off-Site Disposal Of Waste.

a. Prior to its removal from the smelter to an off-site treatment facility, it would be necessary to provide the third party handler with a clearance which would certify the material was asbestos free. This requirement could not be satisfied due to the pervasive nature of the asbestos contamination and the statutory requirements which limit the treatment options.

These are preliminary comments which can be expanded if needed. If you require any further information please contact me on 0416070709.

Yours faithfully
Banksia EOHS Pty Limited

Jim Orr
CC., BSC, MApplSc, PhD
MAIOH, MAIHA.
Workcover Licensed Asbestos Assessor 000105.
BOHS IP402 Certified.

A6.2 SafeWork NSW Correspondence

-----Original Message-----
From: Christensen, Madeline [mailto:Madeline.Christensen@safework.nsw.gov.au]
Sent: Friday, 29 September 2017 7:46 AM
To: Andrew Walker <Andrew.Walker@hydro.com>
Subject: FW: SafeWork Site Inspection

Security Classification:UNCLASSIFIED
Good morning,

Please see Aklesh's response below.

Have a good day
Kind Regards
Madeline

-----Original Message-----
From: Nand, Aklesh
Sent: Friday, 29 September 2017 1:11 AM
To: Christensen, Madeline
Cc: Cantrell, Phillip
Subject: FW: SafeWork Site Inspection

Security Classification:UNCLASSIFIED
Hi Madeline,
Phil and I have reviewed the record of discussions as provided by Andrew Walker for the meeting on 11 Sept 2017 with Hydro. It was very kind of Hydro to invite us to the meeting and share the options that were being considered for managing the Capped Waste Stockpile (CWS) and the pros and cons of each of those options.

Whilst the record of meeting summarises our comments / discussions during the meeting, it did not contain any details on the options that were presented nor the commentary provided in relation to each of those options.

It should be noted that SWNSW is not the competent authority to comment on what is the most suitable option / process for the remediation / rehabilitation of the site. The competent authority is the NSW EPA who will need to provide their comments / approval on the preferred option for managing the CWS.

SWNSW as the WHS regulator has keen interest in this project from a worker health and safety perspective as there is potential for significant worker exposure to a range of hazardous chemicals currently in the CWS. The option of dealing with the CWS that eliminate / minimises worker exposure would be the preferred option from our perspective. And this would mean not moving the CWS from its current location. However, due to current ground water contamination, this option has been ruled out. Whilst we are not environmental experts, options should be investigated on how ground water contamination at the current location of the CWS can be remediated / eliminated without moving the CWS. If this was not possible, then the best option should be selected in moving the CWS which minimises worker exposure to hazardous chemicals.

And once a decision has been made on which option is selected for managing the CWS, we can meet with Hydro representatives again and provide further comments / advice /assistance in relation to minimising worker exposures / worker exposure monitoring / worker health monitoring and potential controls.

Hope these comments are of assistance and these comments together with the records of discussion from the meeting on 11 Sept 2017 can be submitted to the EPA.

Kind regards,

Aklesh Nand
Manager - Hygiene & Toxicology
Hazardous Chemical Facilities & Safety Management Audits SafeWork NSW, Better Regulation Division
Department of Finance, Services and Innovation p 02 8867 2726 | m 0421 618 630 e
aklesh.nand@safework.nsw.gov.au |
https://emea01.safelinks.protection.outlook.com/?url=www.safework.nsw.gov.au&data=02%7C01%7Candrew.walker%40hydro.com%7C1cfb30c867924e31049608d506ba65af%7Cbc1d89914a284552abc1ace7ae108274%7C1%7C0%7C636422320070044758&sdata=LzmntXd4%2B1zVnopcL3GwjsKWWSRHHuefdbs6Za0HsaY%3D&reserved=0 Level 1 , 2 Burbank Place, Baulkham Hills NSW 2153

-----Original Message-----
From: Christensen, Madeline
Sent: Monday, 25 September 2017 8:09 AM
To: Nand, Aklesh
Subject: FW: SafeWork Site Inspection

Security Classification:UNCLASSIFIED
Hi Aklesh,

Can you please read the attached document and let Andrew know if SafeWork is comfortable with the suggested approach.

Thanks

Madeline Christensen
Assistant State Inspector

SafeWork NSW, Better Regulation
Department of Finance, Services and Innovation p 02 4921 2982 | m 0412 819 031 e
madeline.christensen@safework.nsw.gov.au |
https://emea01.safelinks.protection.outlook.com/?url=www.safework.nsw.gov.au&data=02%7C01%7Candrew.walker%40hydro.com%7C1cfb30c867924e31049608d506ba65af%7Cbc1d89914a284552abc1ace7ae108274%7C1%7C0%7C636422320070044758&sdata=LzmntXd4%2B1zVnopcL3GwjsKWWSRHHuefdbs6Za0HsaY%3D&reserved=0 Level 1, Suite C, 8 Cowper Street Carrington NSW 2294

Please consider the environment before printing this email

-----Original Message-----
From: Andrew Walker [mailto:Andrew.Walker@hydro.com]
Sent: Friday, 22 September 2017 6:04 PM
To: Christensen, Madeline; Cantrell, Phillip; Nand, Aklesh; Middleton, Scott
Cc: Richard Brown; Andrew Solomou; James Brown; Fiona Robinson; staylor@ramboll.com; Belinda Sinclair
Subject: RE: SafeWork Site Inspection

Hi Madeline,

Further to my email below, Ramboll-Environ have written a record of discussion from the meeting we had on the 11/9/17. We were hoping to be able to attach this document to the CWS waste management options report that we are intending to submit to the EPA in about a week's time. Can you please review this document and let us know if you are comfortable with this approach. If you are not comfortable with this approach please let us know and we will understand. I have attached the Word version in case you or your colleagues would like to suggest some changes.

We see SafeWork NSW as a key stakeholder in the remediation process, especially with respect to Worker Safety and Human Health issues and we would like the EPA to be aware of SafeWork NSW's position on these issues.

Thanks and regards,

Andrew Walker
Project Manager
Hydro Aluminium Kurri Kurri Pty Ltd
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-----Original Message-----
From: Andrew Walker
Sent: Thursday, 14 September 2017 9:29 AM
To: 'Christensen, Madeline' <Madeline.Christensen@safework.nsw.gov.au>; Cantrell, Phillip <Phillip.Cantrell@safework.nsw.gov.au>; Nand, Aklesh (Aklesh.Nand@safework.nsw.gov.au) <Aklesh.Nand@safework.nsw.gov.au>; Middleton, Scott (Scott.Middleton@safework.nsw.gov.au) <Scott.Middleton@safework.nsw.gov.au>
Cc: Richard Brown <Richard.Brown@hydro.com>; Andrew Solomou <Andrew.Solomou@hydro.com>; James Brown <James.Brown@hydro.com>
Subject: RE: SafeWork Site Inspection

Dear Madeline, Phil, Aklesh and Scott,

Thank you for making the site visit on Monday 11/9/17. As the Net Environmental Benefit Analysis (NEBA) analysis and presentation is a lot to take in the first time around, I am attaching a copy of the presentation for your review.

It would be good to receive your feedback on this presentation and any insights you have on the various options we have considered, especially with respect to worker safety and human health. As you are aware we have some concerns around what is being asked of us (by the EPA) and our interpretation of that in Option 3. It would be good to get feedback from SafeWork NSW on any concerns you have on the various methodologies we discussed, especially the ones proposed for Option 3. If we could have your written feedback on the issues discussed in the meeting, our intention was to attach this to the report that we are about to send to the EPA as an appendix, if this was agreeable to SafeWork NSW. Please advise if this is OK?

As discussed you are welcome to have a copy of the full report we are sending to the EPA for your reference. The report should be available by the end of next week.

Thanks again.

Regards,

Andrew Walker
Project Manager
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E: andrew.walker@hydro.com

-----Original Message-----
From: Christensen, Madeline [mailto:Madeline.Christensen@safework.nsw.gov.au]
Sent: Tuesday, 12 September 2017 2:53 PM
To: 'craig.cheeseman@deltagroup.com.au' <craig.cheeseman@deltagroup.com.au>
Cc: 'michael.lawrence@cmacontracting.com.au' <michael.lawrence@cmacontracting.com.au>; Andrew Walker <Andrew.Walker@hydro.com>
Subject: SafeWork Site Inspection

Good afternoon,

Attached is the Workplace Inspection Report that is generated following a visit to a workplace.
Could you please forward this report onto the appropriate people.
I contacted Zenith WorkForce and spoke with Mandy Ingersoll who is making some enquiries and will get back to me.

If you have any questions about the inspection report please do not hesitate to contact me.

Regards
Madeline Christensen
RSD North
SafeWork NSW
Phone : +61 (2) 4921 2982
Email : madeline.christensen@workcover.nsw.gov.au

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RAMBOLL

ENVIRONMENT
& HEALTH

RECORD OF DISCUSSION

Project	**Hydro Aluminium Kurri Kurri Capped Waste Stockpile Waste Management Options Evaluation Study**
Subject	**SafeWork NSW Briefing of Capped Waste Stockpile Management Options Evaluation**
Date	**11 September 2017**
Location	**Hydro Aluminium Kurri Kurri**
Taken by	**Belinda Sinclair**
Participants	**Safework NSW: Madeline Christensen (MC), Phill Cantrell (PC), Aklesh Nand (AN), Scott Middleton (SM)** **Hydro: Richard Brown (RB), Andrew Walker (AW), Andrew Solomou (AS), James Brown (JB)** **Banksia EOHS: Jimm Orr** **Ramboll Environ: Shaun Taylor (ST), Jimm Orr (JO)**
Absent	**N/A**
Copy to	**All attendees**

- RB conducted a presentation providing a background to the Capped Waste Stockpile (CWS), examples of what is done with aluminium smelter waste elsewhere in Australia and overseas, the identified potential options and outlined the CWS Waste Management Options Evaluation Study and its conclusions.
- Following conclusion of the presentation RB requested input of comments and questions.
- JO stated that it is legislatively prohibited to high pressure water blast or crush asbestos containing material and as such any Management Option which results in either of these actions would be prohibited. SafeWork NSW indicated agreement with JO.
- PC questioned the feasibility of building a trench and filling it with an appropriate product (such as limestone or other reactive product) and slant drilling into the waste to prevent the downstream ecological impacts from the existing CWS. RB responded that this option has been explored and has been dismissed as it: does not address other waste management requirements of the Hydro Land, including demolition waste, contaminated soils and other areas of remediation (such as Hart Road Municipal Landfill and Dickson Road Landfill); the calcium would deplete over time, and need to be replenished; laboratory research shows it would need to be an active barrier (using calcite). RB also noted that the CWS location is not ideal for such a waste facility (with associated community concerns) or to facilitate future redevelopment.
- RB noted that the EPA is showing signs it understands the difficulties around recycling of the carbon and steel however are still considering that treatment is the appropriate path.
- RB described the Fate and Transport model and its output and emphasised that treatment would provide no environmental benefit due to the nature of the geology surrounding the Containment Cell site.
- MC questioned what treatment with lime would entail. RB noted that various lime treatment processes have been considered, including application of lime with the daily cover at the Containment Cell, adding to trucks to encourage mixing when placed in Containment Cell or crushing and mixing.

- PC questioned why not treat the waste with lime. RB responded that treatment with lime presents no environmental benefit (as presented previously), and actually presents additional safety and greenhouse gas emission risks.
- JO reiterated that due to the presence of asbestos within some of the material proposed to be crushed, crushing of the material to treat it would not be allowed.
- PC noted concern regarding managing exposure to PAHs resulting from a negative experience at another site. JO added that high pressure water blasting will also liberate PAHs however he thought suitable management could be achievable.
- ST noted that the Options Study intended to assess all potentially feasible options without consideration of regulation and cost. Following completion of the Net Environmental Benefit Analysis (NEBA) assessment, if we are to now consider regulatory requirements it is understood by Hydro and Ramboll that tasks such as crushing or high pressure spraying of asbestos containing material would not be considered acceptable to SafeWork NSW. MC indicated agreement.
- MC questioned from a practicality perspective if there would be anything larger than a truck requiring to be relocated to the Containment Cell. AW responded that it is likely (such as the collector bars with the attached cathodes). RB reiterated that it is not until excavations begin that Hydro will fully understand what is contained in the CWS.
- AN was interested in the location of the Containment Cell which RB demonstrated on an aerial photograph.
- MC questioned if any of the waste would be required to be transferred on the public road system to the Containment Cell. RB noted that some of the additional Hydro Land remediation tasks would require public road access however transport of the demolition waste and the CWS would only be transported within the Smelter.
- SM questioned how asbestos would be managed once excavation of CWS began. RB noted that some water (via misting) would be required, which would require appropriate management of the asbestos-containing runoff. Asbestos air monitoring would also be undertaken. MC questioned if a chemical sealant such as PVA would be appropriate. AS added that this has been considered and would continue to be investigated.
- PC concluded that once the decision had been made with regards to which management option was progressed that SafeWork NSW would be appreciative of another meeting to determine the way forward.

Meeting close.