MINUTES

Subject: Berrima Colliery Closure Working Group (Meeting 14)

Location: Berrima Cement Plant Engineering plus Microsoft Teams

Date & Time: 16th September 2022

Independent Chair: **Brad Mullard**

Attendees:
Brad Mullard - Chairperson
Peter McMillan – Environmental Inspector, NSW Resources Regulator
Greg Kininmonth – Manager Environmental Operations Southern, NSW Resources Regulator
Andrew Couldridge – NSW Environment Protection Authority
Carly Roder - NSW Environment Protection Authority
Ravi Sundaram – Mining Catchment Specialist, WaterNSW
Alan Lindsay – Local Resident
Ray Nolan – Local Resident
Julian Brophy – Local Resident
Graham Kelly – Local Resident
Barry Arthur – Manager Environment and Sustainability, Wingecarribee Shire Council
Tony McCormick – Local Resident representing Mandemar Lane

Boral Personnel:
David Spears – Project Manager, Boral Cement
Greg Johnson – Environmental Sustainability Manager, Boral Cement
Minutes: - Robert Byrnes*

Apologies:
Dr Ian Wright – University of Western Sydney
Clive West – Local Resident
Girish Yadwad – National General Manager Operations, Boral Cement
Greg Newman – NSW Environment Protection Authority
Kate Woodbridge – Stakeholder Relations Manager, Boral Land & Property)

These minutes reflect the presentation and consequent conversations conducted as part of this meeting. The content, while an accurate summation of proceedings, should not be taken to represent exact dialogue unless specifically minuted as such. Text in italics have been added by the minute taker for clarification or to reference items being spoken about such as the presentation slides, graphs or other meeting materials.

For the full presentation, visit www.boral.com.au/medway. Minutes do not become 'official' unless endorsed at the following meeting by the appropriate representatives.

** Boral Cement uses the services of International Environmental Consultants (IEC) to undertake environmental monitoring and technical report preparations for the Berrima Colliery. Rob Byrnes, owner and Director of IEC, acts as the nominated minute taker for the Closure Working Group (CWG) via the appointment of Boral Cement.*

MINUTES

Meeting opened – 10.10am

1/2 Welcome and apologies/Terms of Reference

BM: Welcome all, are there any apologies? I believe we have a guest here today? Lance Ward from the Medway Community Association
GJ: He hasn't arrived yet but we will keep an eye out for him.
BM: Thank you, I would like to remind people of the terms of reference in relation to the Code of Conduct, that all members treat all others appropriately and with respect. Are there any comments on the minutes?

BM: Any comments on the draft minutes?

(*general consensus in relation to minutes*)

BM: We will confirm the minutes as accepted.

3. Actions from Previous Meeting

BM: We will now go through the actions from the previous minutes.
GJ: (*referring to presentation slide 9*) there were six actions, the first was for Boral to provide a copy of the AEMR and information newsletter to Tony McCormick. This was done straight after the last meeting.
TM: I will have to check my email.
GJ: The second was for Boral to correct the web page with all current data and reports. Kate has done that and will include todays meeting as well. This will be an ongoing matter that we will ensure keeps happening. The next item was for Boral to place the REF on the web page when it is complete, the document is still in draft form but will be put up on the web page when finalised. The next item was for Kate to confirm that the newsletter was distributed to Berrima residents. Kate has confirmed this. The fifth item was for the CWG to relay the group's condolences to the family of Chris Maher. This was done. The sixth item was for Boral to follow-up with the Resources Regulator on their participation during the REF community consultation program. This has not been done yet but will be once the REF has been finalised.
BM: Any comments on the actions? Let's move onto the water quality results.

4. Water Quality Results Update

GJ: Discharge volumes have stabilised at the 1.9ML per day. We have got the pH back to a more neutral level as a result of the dosing. The Electrical Conductivity has slightly increased to above the 1,000 µS/cm over the past few months. As we mentioned in our last meeting, we had some higher levels of Iron and Manganese but we have now managed to get these under control. We are not sure of the source or reasons for the elevated minerals but the last two results have been much better with Iron back down to below detection levels and Manganese to within previous trends. The Iron levels are higher in the river than in the discharge. Similarly for Manganese, the previous elevated results are now trending down in the discharge and is now back to a level of 3.1 mg/L.
RS: Could that be a monitoring error?
GJ: We don't think so. If it was just one sample that was elevated it could be a laboratory error but there were a few results that were similarly elevated.
DS: When we had the increase in minerals, we upped the lime dosing which increased in the pH and reduced the levels of minerals in the discharge.
GJ: We have found that it is important to keep a close eye on the pH levels and make sure it doesn't drop below neutral. We also make sure the aeration process is working which is also important.

AL: Are you confident when you put the new facilities in place that the treatment process will be more stable?
GJ: Yes, it will be a lot more controllable as we will be pumping all the water to the surface for treatment where at the moment we are only pumping a small proportion of the water to the surface for additional dosing and still relying on the underground limestone treatment for the majority of the process.
DS: At the moment it is all very remote and is relying on difficult to access underground locations. It will be a lot easier when the treatment system is entirely on the surface and can be monitored more closely in real time at every step of the process.
BM: Will you be aerating on the surface?
GJ: At present we are just dosing a proportion of the water on the surface with lime. The proposed new system will also include aeration as well as dosing and pH correction.

TM: Has any work been done on tracking these results against rainfall over the past couple of years?
GJ: We take note of rain events and discuss these with the results. Particularly the river quality results have been discussed in light of rain events. But we don't track rainfall events on the graphs.
RB: We have done some work in the past tracking high rainfall periods and water levels and quality underground. The work was not conclusive though there is some evidence that several months after a period of heavy rainfall that water make underground increases. There is a stronger correlation between high rainfall periods and water quality variability in the river.
TM: There is a lot of water in the ground at present and I would have thought that this would be better in terms of water quality.
GJ: It's the other way around, more water passing through the strata will cause higher rates of minerals leaching into the mine water. Water quality is impacted by water passing through fractured sandstone above the workings.
TM: The extra water wouldn't dilute the minerals?
GJ: No, it just means more minerals leaching out of the strata.
BM: But it might be reflected in higher volumes?
DS: The discharge rate has been very consistent.
GKelly: It has been consistent for quite some time now.
AL: The water table has been rising to some extent.
GJ: The groundwater is not just discharging from the adit but also elsewhere from the mine.

AC: How well do the results at present reflect the quality of the water behind the bulkheads?
DS: We haven't taken any results from behind the bulkheads recently.
GJ: We did take samples from behind the bulkheads for some time and we can do some more in the next sampling round.
DS: The previous results showed very poor water quality behind the bulkheads but given the recent spikes it would be worthwhile doing another round of sampling.

GJ: (*referring to presentation slide 17*) in relation to river water quality, the discharge has not influenced the pH of the river, there is a slight influence with Electrical Conductivity but this also depends on the volume of water in the river. There has been no impact on the river with Iron in the discharge as you can see the Iron levels in the discharge are now below detection levels. There are higher levels of Iron in the river than in the mine discharge. Manganese levels are higher than the river but dissipate quickly downstream of the discharge point and in some cases the levels of Manganese are higher upstream than downstream. The upstream sample point is the Old Hume Highway Bridge at Berrima. The MacArthur's Crossing sample site is also upstream about half way between the Berrima Bridge site and the mine discharge.

RS: WaterNSW are currently sending large volumes of water down the Wingecarribee River from the Reservoir over the past six months. This would provide additional dilution.

GJ: The discharge does have an effect on Nickel and Zinc concentrations in the river immediately below the discharge point, which is within the mixing zone but are well below the ANZECC goals.
RS: What would be interesting to know is if these metals are being flushed further downstream from the mixing zone because of the high flows that are being sent through.
GJ: What we do know is that the water quality within the downstream site is well below the ANZECC freshwater protection goals. The levels go down at Biloela but go back up at the far downstream site (Bunnygalore).
RS: That is the flushing effect.

GJ: Copper and sulphate levels are below the trigger points. Any comments on the water results?

5. Water Treatment Update

DS: The existing underground water treatment system is still in place. We are still pumping water from the bulkheads to a underground roadway lined with limestone aggregate. The aeration system is still operating however we also pump a proportion of the water to the surface for dosing with lime to help stabilise the pH to assist with the removal of minerals. As the pH varies we increase or decrease the dosing rate accordingly. There is a delay of about a day between determining the need for pH correction and making the required dosing rate adjustment. This delay would not occur when the system is entirely on the surface.
DS: The water level behind the bulkheads has remained constant as it has for the past year. The water level has been maintained by the pumping system underground. This system pumps water to the underground passive treatment system.

GKelly: Is there a reason why the water quality behind the bulkheads is poor?
DS: The water behind the bulkheads represents water passing through the overlying sandstone geology where it picks up oxidised minerals. The leaching of minerals from the strata will continue.
GJ: The 1.9ML of water that we discharge is being constantly replaced by water entering the mine behind the bulkheads. The water make in the mine is stable and the leakage around the bulkheads has been stable as well.
TM: At what level behind the bulkheads that you draw the water from?
DS: We draw water from around 600mm above the floor behind bulkhead number 5 which isn't the lowest bulkhead. The lowest bulkhead is number 3. So the lowest point is about 1 m below the point where we pump from.
TM: Is there much mixing of the waters behind the bulkheads?
DS: It is pretty static behind the bulkheads.
GJ: It would be interesting to know if there have been any changes in water quality behind the lowest bulkhead.
DS: We can sample behind each bulkhead, there is more settlement of minerals behind the lowest bulkheads.
BM: Any other questions?

BA: Earlier on in the process the risk of sealing up the site could result in escape points along the escarpment into the river. With the installation of the bulkheads have there been any observations of escape points along the escarpment?
DS: Because of the depth of the bulkheads, which are located below the level of the river, any leakage from around the bulkheads just re-enters the mine workings and discharges through the drain adit. The concern in relation to the escarpment was if we installed bulkheads in the workings near the escarpment (near the drain adit) the pressure would build-up and could escape. The river level at the particular location where the

underground bulkheads have been installed is higher than the coal seam. At the drain adit, the river is below the coal seam.

6. Pit Top Treatment

GJ: The condition that is on our Environment Protection Licence requires us to prepare an environmental assessment, which is referred to as a Review of Environmental Factors (REF), which will contain more information on the project and identifies the potential environmental impacts that may arise from the construction and operation of the project. The REF will also identify the pros and cons of the project.
GJ: The pipeline will start at the pit top and then goes along the old railway easement. The entire corridor is on Boral owned land and is covered by our Environment Protection Licence. The pipeline will be buried and will include a few road crossings which will be under bored.

TM: What happens to the water when it is no longer required by the cement plant?
GJ: We will only be pumping what the cement plant needs, the rest will go back to the river. There will be two phases, the first will be the pit top treatment system and the second will be the construction of the pipeline. The pit top treatment system will be the first constructed. This will allow all the water to be pumped up from the mine to be treated and then released back into the river. The second phase will be the installation of the pipeline which will supplement the cement works water needs. On average, the cement works uses 0.6 ML per day, so not all the water pumped from the mine, (*currently approximately 1.9 ML/day*) will be transferred to the cement works. Also, the cement works has several stormwater control ponds including the shale pit which are sources of water. It is better for the cement plant to use what it has captured first before using water transferred from the mine.

JB: Once this is installed and operating will the adit be closed?
GJ: There will be some residual water being released from the adit, about 100,000 litres per day which will come from the old mine workings and any leakage from the bulkheads. We will be discharging treated water from the pit top treatment system further upstream which will assist with dilution.

GJ: (*referring to presentation slide 28*) In summary, the project will involve pumping of water from the mine to a purpose built passive treatment system at the pit top. The treatment system will involve aeration, pH correction and settlement via a multi-celled pond. Treated water will be discharged back into the Wingecarribee River via a new licensed discharge point. A portion of the treated water could be sent to the Berrima Cement Works via a pipeline along the existing railway easement which is owned by Boral and covered by the existing colliery EPL. The pipeline will reduce the need for the cement works to pump water from its existing licensed river pump-out. The cement plant will still use harvested water from its on site pollution control ponds and the shale quarry.
GN: Is that the final design of the treatment system or will you need to go to a specialist treatment expert for detailed design?
DS: It is a concept design which has had input from a water treatment consultant.
GJ: It will still be subject to detailed design and engineering. We have sent a draft to the EPA for review.
AC: We are still assessing the draft REF.

TM: What is the water depth in the ponds and what is the treatment process? Is it just pH adjustment and aeration or is there any macrophytic polishing?
DS: It will be a simple passive system involving pH adjustment, aeration and settlement. Provision will be made for cleanout of settled minerals. This is why there are multiple ponds, to allow taking some offline for sediment removal.

GJ: There would not be room for macrophyte beds and probably no need as these are used for nutrient uptake in sewage treatment.
TM: I have been involved in some of the largest wetlands in Australia for water treatment. So the first pond is for aeration and then settlement?
DS: We have done trials on the process and found simple aeration and settlement can remove the Iron which is the main problem.
GJ: Behind this concept design there has been a lot of advice and engineering from water treatment experts.
RB: The iron is the main problem, once removed the water is actually quite good groundwater.
RN: Ferric iron is insoluble but it is the algae that grows on it which is also a problem.
AC: There are also other metals such as Nickel and Zinc which can be problematic in low flow conditions. Iron is the more visible pollutant but others need to be considered. The project should have some effect on lowering the concentration of these metals as well.
GJ: There has been a lot of work done on the health of the river, including several aquatic ecology studies, ecotoxicology and long term water quality assessments. These have looked in detail at all the minerals and their potential impacts.

PM: When you say you can adjust pH, are you referring to active dosing with lime?
DS: Yes we could use a lime dosing system if needed or just use limestone aggregate.
PM: So it is an active - passive treatment system?
DS: the system will need to be actively managed, and will be fully automated.

GJ: (*referring to presentation slide 29*) The project will result in some impacts but these are largely restricted to the construction phase such as truck traffic and noise. These will be temporary and largely felt on the Medway Community. We did have a representative of the Medway community who was going to attend.
BM: Need to follow up on the representative and see if he can attend next meeting.

GJ: Summary of benefits for the project include a reduction of environmental risks as a result of mine closure, improved water quality within the Wingecarribee River due to more consistent and effective water treatment capability, better reuse of the water resource by reducing the Cement Works extraction of water directly from the river and increase in the baseflow of water between the existing river pump-out upstream of Berrima township to the new discharge point at the Colliery. It also provides a source of water to the Cement Plant during drought periods. During the last drought, the cement plant had to truck water into the site from the town water supply.
RN: and supply the Medway Village?
GJ: We haven't supplied the Medway Village for several years now and this is not part of the project. There have been changes to legislation and Boral does not want to be classified as a water supply authority.

RS: When will you be able to share the draft REF?
GJ: Do you want to see a draft before it is finalised?
RS: Yes if possible.
GJ: We can supply the draft, and we can also send it to Greg and Peter (Resources Regulator).
AC: If we could get any comments from the other agencies back to the EPA as soon as possible that would be great. From my perspective the review of the draft is just in terms adequacy before it is finalised. We would not be after detailed comments but rather has it covered all the necessary aspects of the project and its impacts.
BA: Council would only be interested in the final document, we would not need to review the draft.

TM: Does Council have a role in the approval process?
BA: No.
TM: So who is the approval authority?

GJ: The EPA.
TM: and will it be exhibited?
GJ: The project value is less than $5million and therefore the public display process is up to us to determine. It will be available to the public on the colliery webpage. Once the REF is finalised we will also provide a copy to all the CWG members. We will also have a pop-up open day for the community.
BM: How will you be promoting the community pop-up?
GJ: Kate will need to work this through and November may be a good time to hold it as well. Kate will work through the advertising process with social media, newsletter and local radio. It would be similar to our previous one held at the community hall.
JB: I agree with Greg, November would be best, before people go on school holidays. It gets more difficult closer to the end of the year.
GJ: We will also need to work with the Medway Community Association because they are the closest to the project. We might be able to attend one of their community sessions to provide a presentation on the project.

AL: How wide is the railway easement?
DS: 20 meters.
GJ: It is also used for a private power line to the colliery.

7. Medway Community Update

GJ: Unfortunately our guest was not able to make the meeting. We were hoping to just provide an introduction to the group and an outline of the issues of concern to the Medway community. We are hoping to form a relationship with the Medway group moving forward, particularly as there can be ongoing operational issues between the activities at the pit top and the community.

8. Communications Update

GJ: (*referring to presentation slide 35*) Community engagement associated with the pit top treatment project is continuing. A letter was delivered to all residents in Medway Village, New Berrima and Mandemar Lane residents to provide them with details of the proposed pit top treatment and pipeline project. It included a map of the pipeline route and details of the environmental assessment being undertaken and the EPA assessment process.
JB: Kate and I had a conversation about the newsletter distribution and to contact the Berrima Post Office.
GJ: We also had some communications with the Medway Community in relation to some rubbish dumping.
BA: Our investigators look into cases of illegal rubbish dumping, notification of illegal dumping can be made to Council via our web page or just calling the general number. In hot spot areas we can put up signs and install measures to reduce access to dumping sites.

9. General Business

TM: all I have to report on in relation to the Mandemar residents is that one resident has come to an arrangement with Boral and one is still being negotiated. I understand this resident will be getting back to Boral shortly. There appears to be some progress in resolving the outstanding issues.

BM: any further business, if not then the next meeting date?

10. Next Meeting

GJ: Suggest the next meeting be Wednesday 14th December 2022.

GK: Suggest 10.30 am to avoid other meeting conflict.

GJ: I will put a meeting request out with the date. I will also keep everyone in the loop with the date of the consultation pop-up meeting. This is likely to be on a Saturday.

BM: that concludes the meeting, thank you all for participating.

Meeting Closed 11.10am

Summary of Meeting Actions:

1. Boral to include water quality testing from behind the bulkheads and report results at the next meeting.
2. Extend a further invitation to Medway representative for the next meeting.
3. Boral to provide a draft of the REF to WaterNSW and the Resources Regulator for review.
4. Boral to determine date and appropriate advertising for a pop-up community meeting in relation to the water treatment project.
5. Boral to follow-up with the Resources Regulator on their participation during the REF community consultation program.