



NB: Note that minutes are paraphrased to an extent and may not exactly match actual statements.

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|-----------------|--|--------|--------------|
| Project | Hydro Kurri Kurri site redevelopment project | From | Janita Klein |
| Subject | Community Reference Group | Tel | 02 4979 9933 |
| Venue/Date/Time | Thursday 21 August 2014 Hydro offices, Kurri Kurri 6.00pm – 8.00pm | Job No | 21/23175 |
| Copies to | All committee members | | |
| Attendees | Mr Richard Brown – Managing Director, Hydro Kurri Kurri Mr Kerry McNaughton – Environmental Officer, Hydro Kurri Kurri Clr Morgan Campbell – Cessnock City Council Clr Arch Humphery – Maitland City Council Mr Ian Turnbull – Manager Natural Environment Planning, Cessnock City Council Mrs Kerry Hallett – Manager, Hunter Region BEC Mr Rod Doherty – President Kurri Kurri Business Chamber Mr Colin Maybury – Kurri Kurri Landcare Group Ms Debra Ford – Community representative Mr Alan Gray – Community representative Mr Bill Metcalfe – Community representative Mr Brad Wood – Community representative Mr Barry Miller – Community representative Mr Toby Thomas – Community representative Mr Michael Ulph – CRG Chair, GHD Ms Janita Klein – CRG minutes, GHD Mr Andrew Walker – Hydro Mr Shaun Taylor – Environ Ms Fiona Robinson – Environ Mr Mark Roser – Maitland City Council – delegate for Ian Shillington | | |
| Apologies | Mr Ian Shillington – Maitland City Council | | |
| Observers | Ms Helen McGee (Weston) | | |



| Notes | Action |
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Michael Ulph (Chair)

Welcome and Acknowledgement of Country

Introductions for technical specialists and observers

Meeting commenced at 6.05 pm

2. Meeting agenda

- Welcome and meeting opening
- Adoption of minutes from the last meeting
- Adoption of CRG Terms of Reference
- Discussion of site contamination assessment and remediation options
- Questions about site contamination and remediation
- General business
- Meeting close

3. Welcome and meeting opening

Michael introduces himself and technical specialists in attendance, including:

- Andrew Walker, Hydro
- Shaun Taylor, Environ
- Fiona Robinson, Environ

Michael also welcomes Mrs Helen McGee who attended with Colin Maybury tonight.

Last meetings minutes and CRG Terms of Reference

Michael Ulph confirmed the minutes from last meeting were emailed in draft copy to each committee member for review and made available on the Hydro website. There had been no committee amendments to the draft minutes apart from collating the action items into a table at the end.

Minutes moved as a true and correct record by Alan Gray, seconded by Toby Thomas.

Michael Ulph: Thank you. As discussed in last month's meeting, the CRG Terms of Reference also remain in draft to be finalised and adopted by the committee. There were a number of action items relating to the CRG Terms of Reference.

Richard Brown was to provide more information on the sustainability indexes referenced in the previous power point presentation. Richard, do you have more information on this?

Richard Brown: The sustainability indexes referred to Hydro injury records and showed that total injuries were improving over time. This index was one measure of safety and sustainability.

Michael Ulph: Thank you Richard. I also had some items to action. The first was to attempt

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Action

contact with the Mindaribba Local Aboriginal Land Council regarding representation on the committee. I have called and emailed, and have not heard back. Another action was to alter the Terms of Reference to remove committee representation by State government organisations. State government representatives would attend on occasion as required, such as the planned site tour. These have been actioned.

Can I have two volunteers to move for the finalisation and adoption of the CRG Terms of Reference?

Kerry McNaughton: I move this.

Morgan Campbell: Seconded.

Michael Ulph: Thank you. We have asked for interested people to put forward topics of discussion at the CRG committee meetings, which will be given priority. Likewise, any issues and discussion topics can be brought forward from the community and Council. At the very least, all discussions including questions and answers are captured and made available in the meeting minutes.

Discussion of site contamination assessment and remediation options

Michael Ulph: Discussion tonight is about site contamination and environment. I will hand over to Richard to present.

Richard Brown: As we move through the presentation you will see PowerPoint slide numbers at the bottom on the screen, I ask that you please make a note of the slide number and any questions you may have.

We will endeavour to answer these at a mid-point, or at the end of the presentation. We will have a mid-point break to answer any question at around slide 30.

Hydro Aluminium Kurri Kurri



(2)



Our vision

As you may recall, at last month's meeting we talked about Hydro's vision to fulfil our environmental and regulatory obligations in relation to the permanent closure of the site. This work is an enabler for the potential redevelopment of the site. With regard to this, today we will concentrate on:

- What we know about the Site's history;
- How we have assessed if impacts have resulted from historical activities;
- How we have assessed if remediation of identified impacts is required;

Hydro's Vision

Fulfill our environmental and regulatory obligations in relation to the permanent closure of the smelter in order to:

Realise an uplifted value of the land holdings through the development of a strategic re-use plan, facilitated by appropriate re-zoning and a staged disposal process.

Contribute to the region's/community's prosperity following the closure of the operation by providing land development opportunities for employment, residences and biodiversity conservation.

(3)

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- What remediation is proposed and how we proposed to achieve this.

There is a lot to get through, so let's get started.

Assessment of Potentially Contaminated Land – The Process

There is a prescribed process to go through; a regulatory process we've undertaken.

As shown in this slide, the first step is to carry out a desktop review of the smelter and other activities undertaken on our land.

The second step is to carry out field investigations: to go out and assess areas across site where there is expected contamination.

The results are compared against appropriate guidelines. The process is iterative, and goes through various loops to determine the need and type of remediation required.

Remediation is then carried out, and the site validated for its proposed use and signed off as appropriately. We are engaging an accredited auditor to provide an independent third party review of the process.

As you may remember from last month, the site is large at around 2000 hectares. For the purpose of assessment and remediation, we have broken the site up into bite size chunks, to look at each area as a distinct part.

As shown in slide 6, while assessment reports are largely in draft form at this stage, most field work is now complete.

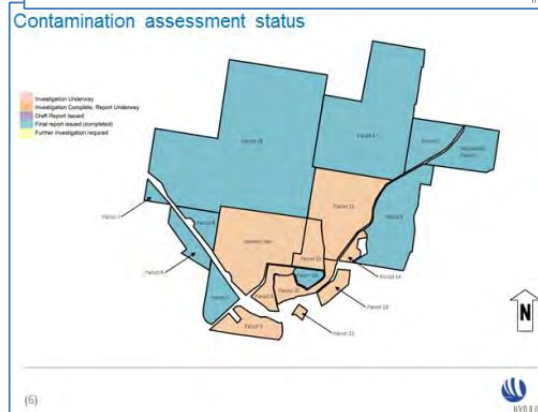
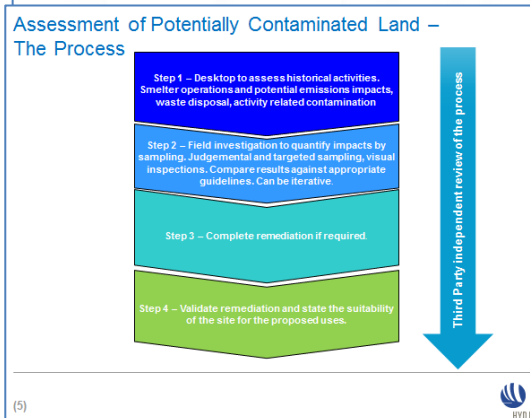
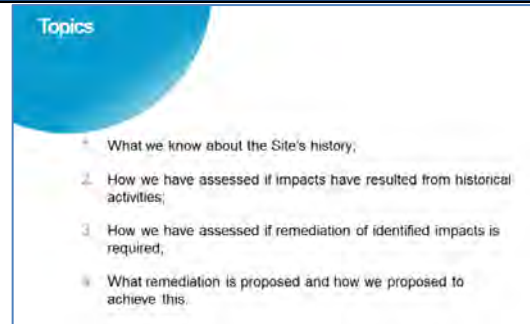
Bushland areas and illegal dumping

What we found is that the area is largely bushland, land not actively used by the smelter or other activities. There are no adverse impacts on the bushland. The only thing we found was illegal dumping, in isolated areas.

Michael: Richard, what do the two yellow statements say on the slide?

Richard Brown: Adverse impacts to soil and water from air emissions, dust deposition and irrigation of stormwater were not identified.

Action



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Grazing and bush areas of the buffer zone were impacted by isolated areas of illegal dumping.

Former Kurri Kurri Municipal Landfill

Another area of contamination was the former municipal landfill, located just as you enter Hart Road. This site was formerly a municipal tip (landfill) in the 1940's or 1950's. In the area we can see through excavation, the contaminants are mostly asbestos containing materials, glass bottles, metals.

Wangara Mine Subsidence

The Wangara property mine subsidence. In years since the mine subsidence (100 years) there has been various fill material placed there. And since that time, there has also been illegal dumping in the area.

Smelter Materials

There are other locations where smelter material has been placed on the Wangara site. These materials include inert smelter related concrete and bake furnace refractory brick, and illegally dumped domestic waste.

No spent pot lining or anodes have been identified in the buffer zone.

This slide (slide 11) shows the areas identified as having contamination.

Smelter site

The other main area of contamination is around the smelter site, which has 40 years of operational impact on soils. All storm water is contained on site, and as such drainage lines some have contamination. Also on site is the capped waste stockpile.

Investigations done here relate to materials on site. To the best of my knowledge there are only two known examples of smelter materials going off site. One is during the 1980s and early 1990s certified inert refractories were

taken to underground at Bloomfield colliery, and probably everyone here is aware of the Kline st, site. Where materials were removed from the smelter in an unauthorised manner and deposited on the site at Klein Street. If you or the community have evidence [of other sites], we are happy to do further investigations.

Former Kurri Kurri Municipal Landfill



Wangara Mine Subsidence



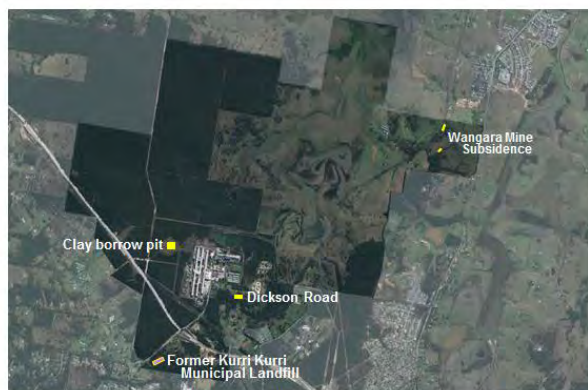
Smelter materials



Four smelter related disposal areas were identified (including Wangara):

- Three where concrete and bake furnace refractory have been used to reinstate excavations or mine subsidence areas.
- One comprising general site materials.

(10)



(11)



Spent Potlining

Okay, now for a quick lesson. In the past and in further discussions we will talk about spent potlining. But, what is it?

Here is a photo of the storage sheds where we are currently storing spent potlining.

When we get a chance in month or so, you can see for yourself.

Each device here is a pot, as the cross section shows (slide 14). Each pot has a lining of carbon and refractory material. They have a finite operational life of around five or six years. During that time, the cathode blocks absorb some of the material used in the smelting of aluminium. They absorb fluoride and sodium, there is a slight ingress of air, and the nitrogen in the air reacts with the carbon in the linings and can form some elements of cyanide.

The refractory process is broken down in to two main fractions:

Commonly the carbon fraction is what we will call the first cut, the carbon material after it has been removed from the pots. The refractory material also gets impacted by the same mechanisms and absorbs sodium and fluoride, and that we call second cut. They are only called first and second cut because they are removed, typically separately. You remove the carbon material in the first process and the refractory material in the second process, which are these blacker materials and cleaner looking bricks (samples handed around).

During its lifetime, those materials absorb chemicals and become hazardous material. Not hazardous in the sense that we are afraid to touch or interact with them, but they have properties that mean that, particularly when they come in contact with water, they can release fluoride and cyanide compounds in the leachate. The water becomes high in pH and can generate gases like hydrogen, methane and ammonia, and those gases can be explosive if they are in sufficiently high concentrations.

(In slide 14, the first cut is the top images, and second cut is the two lower images.)

Properties of Spent Potlining

With any hazardous material there are rules and regulations around handling and management of them. There is a specific set of legislation called the Environmentally Hazardous Chemicals Act, under which is a thing called a Chemical Control Order. Spent potlining or waste materials like it is subject to

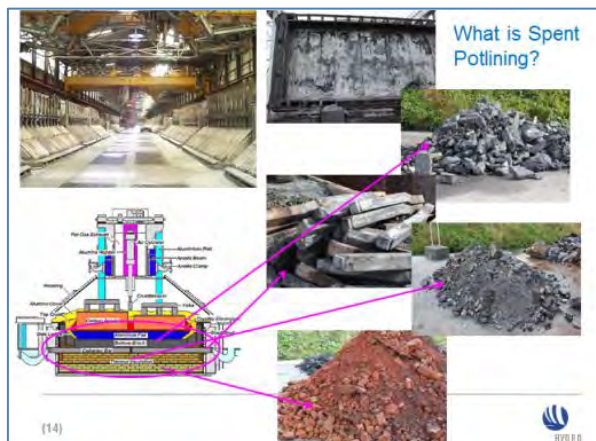
these chemical control orders, and that controls what you can and can't do with them. You have to licences when dealing with it and we have a licence to store spent potlining, and to

Smelter site

- Activity related soil impacts, eg bake furnace scrubber
- Some drainage lines and sediments
- Capped waste stockpile



Spent Potlining



Notes

transport it to facilities on and off site.

These licenses are subject to regulations which determine where you can and can't move these materials.

There are also rules that govern the export of spent potlining known as the Basel Convention. Since the Basel convention, the regulation of materials has slowed down the ability to transport to countries that can reclaim and reuse it.

Spent potlining is an extremely challenging by-product of aluminium

smelting.

There's no denying, that ever since there has been aluminium smelting, there has been spent potlining generated and challenges in how to deal with it.

Examples of the range and types of management protocols for spent potlining (as shown in slide 16) this includes permanent storage in hazardous waste facilities, and use in its untreated form. Our friends at Tomago Aluminium have a history of exporting spent potlining

materials.

The management of spent potlining involves a range of processes. A significant focus of these processes is to produce a waste that can be managed differently.

It is a very challenging material, and a lot of management processes have ceased operation as they were not viable. Alcoa, for instance introduced a process known as Ausmelt which was going to be the great saviour of aluminium spent potlining production. It was never able to be successfully commercialised.

Another significant point here is that in a lot of cases here the aim is to produce 'waste'. So it's not actually aimed to produce anything of significant value, it's about producing a waste that can be managed differently.

Capped Waste Stockpile

The capped waste stockpile is a historical waste management practice. Some of you will know that it has been called Mount Alcan.

Action

Properties of Spent Potlining

- Hazardous Chemical / Physical properties of Spent Potlining are:
 - Contains fluoride and cyanide compounds that are leachable in water
 - Corrosive - exhibiting high pH due to alkali metals and oxides
 - Reactive with water - under certain conditions potential to produce gases that may be flammable, toxic or explosive
- Rules and Regulation
 - Chemical control order (1986) under the *Environmentally Hazardous Chemicals Act 1985*
 - Hydro has licences to store (in capped waste stockpile and sheds) and transport (to processing facilities on and off site)
 - Export is governed by international law (BASEL convention)
 - It is claimed that the regulation of spent potlining has resulted in significant reductions in its reclaim and reuse (Serlie & Oye, 2010)

Table II. Examples of current storage

| | Company | Specific location |
|----------------------------------|-----------------|---|
| Stored in lined sites | RTA | Kitimat, British Columbia, Canada |
| | RUSAL | Saynogorsk, Russia |
| | Alba | Bahrain |
| | Alcoa | Puerto Madryn, Argentina |
| | Elkem | Norway |
| Stored in unlined sites | Vendata | Jharguda, India |
| | Egyptalum | Nag Hammadi, Egypt |
| | RUSAL | Novokuznetsk, Russia |
| | RUSAL | Volgograd, Russia |
| | Hydro | Kurri Kurri, NSW, Australia |
| Stored in buildings | RTA | Isl, Iceland |
| | RTA | Arvida, Saguenay-Lac-Saint-Jean, Quebec, Canada |
| | RUSAL | Taihet, Khakass, Russia |
| Stored in hazard waste sites | Dubai | Dubai, United Arab Emirates |
| | NALCO | Angul, India |
| | Hindalco | Aditya, India |
| Stored in industrial waste sites | Hydro aluminium | Noah Langoya, Norway |

Table III. SPL reused untreated

| Company | Industry | Location |
|--|------------------------|---|
| Albras Aluar | Cement | Brazil |
| SEILCA Tomago | Steel | Italy |
| Inespal, Hydro | Rockwood | Germany |
| RUSAL | Steel, cement (Vrials) | Bratsk, Novokuznetsk, Irkutsk ¹² |
| BHP Billiton, Bayelsa | Cement | South Africa |
| Sterlite Industries | Cement | Korba |
| Shandong Guohua aluminium smelter | Alumina plants | China |
| Hydro's process ¹³ for Al/Si alloys | Aluminium industry | |

[16] Source: Hylwett, G. & Brault, R. (2013) An Overview of Useful Methods to Treat, Recover or Recycle Spent Potlining. *Journal of Metals*, 65 (11), p. 1441-1451

Table IV. Pilot and industrial processes

| Owner | Process | Goal | Development | | | Status |
|----------------------------|-----------------|---|-------------|-------|------------|-----------------------|
| | | | Pilot | Plant | Industrial | |
| ITA (Pechiney) | SPLIT | Industrial waste | x | x | | Stopped |
| Outotec (Lurgi) | Classification | AlF ₃ and industrial waste | x | x | | Stopped |
| Nova PB | Rotary kiln | Industrial waste | x | x | | Stopped |
| Alcoa (Alcoa of Australia) | Ausmelt | AlF ₃ and industrial waste | x | x | | Stopped |
| Alcoa (Elkem) | Arc furnace | Recovery pig iron and industrial waste | ? | | | Stopped ²² |
| RT (Convacon) | COMFOR | Bayer liquor/industrial waste | | | x | In operation |
| Ormet/Alcoa | VORTEX | AlF ₃ /industrial waste | x | | | Stopped |
| Reggin | Rotary kiln | Partially detoxified SPL | | | x | |
| Chalco Zhongzhou | Rotary Kiln | Industrial waste | x | | | |
| Chalco Pingguo | Rotary Kiln | Industrial waste? | | | x | Ongoing |
| Alcoa (Bermudez) | Rotary kiln | Industrial waste | x | x | | In operation |
| Yichuan Smelter | Flotation | Industrial waste | ? | | | |
| RTA | LCL&L | Bayer Liquor, CaF ₂ and industrial waste | x | x | x | In operation |
| BEPESA | Hydrometallurgy | Industrial waste | | | x | In operation |

Industrial waste are landfilled or recovered through the cement industry

[17] Source: Hylwett, G. & Brault, R. (2013) An Overview of Useful Methods to Treat, Recover or Recycle Spent Potlining. *Journal of Metals*, 65 (11), p. 1441-1451

Bill Metcalfe: I helped build it.

Richard Brown: We don't want to refer to its previous owner, so we are going to call it what it is. It's a waste stockpile that has been capped. In any of the documentation that you see it will be referred to as the capped waste stockpile.

Historically, the management of spent potlining and other waste materials that nobody knew what to do with, was a challenge. A location was found on site and materials started to be collected there and that practice went on for decades. The contents of the capped waste stockpile include spent potlining, but it's not just spent potlining. This is an important distinction to make. We know from records of how many pots were demolished, how much spent potlining was generated in the time that the stockpile was in operation, so we now know how much volume of material is in there. Only about half the volume of materials in this pile is spent potlining (around 100 000 tonnes). It is mixed with anything else people didn't know what to do with at the time (the other 90 000 tonnes).

Bill Metcalfe: It's mainly anodes I thought.

Richard Brown: It is anodes, spent potlining, bath, alumina, pallets, and other waste. It's lots of things, and Billy you probably know much better than me, but I've heard stories about forklifts and drums, asbestos and cable. It is not nicely segregated and mixed with other materials, therefore making it mixed waste.

Bill Metcalfe: Back in 1971 they had a problem. They changed the amperage, and the anodes kept burning off and we had nowhere to dump them. My observation was that a lot of it came out of 'extras' in the potline, in the very early days – it may have been added to later on. Because in the early days we never had SPL because the pots weren't dying.

Michael Ulph: When you say 'extras' what do you mean?

Bill Metcalfe: Carbon, carbon anodes. When carbon burns off in a pot you've got to dig it out. We had to dump it somewhere. The trouble was the carbon plant couldn't keep up with the number of them. That was the early days.

Richard Brown: So probably up until the early 1990s material was still being deposited on the waste stock pile. There were some impacts from the leachate generated from that stockpile both localised impacts in groundwater and vegetation. Until the regulators of the time said "that's it, no more, you need to do something with this pile". In 1993 the smelter received consent for the pile to be capped, and it was capped in 1995. An interesting note in the development consent condition stated that that due to nature of spent potlining, there was no risk associated with its storage that cannot be overcome with appropriate design.

In terms of the cap I think that's still valid, but as you'll see, it is the location of the stockpile that has basically let it down.

Capped Waste Stockpile

- Historical waste management practice
- Contents are mixed smelter wastes including spent potlining
- Received planning approval in 1993, managed under the site Environment Protection Licence and a licence under the Environmentally Hazardous Chemicals Act 1985
- Capping was completed in 1995
- Development consent condition stated '*Due to the nature of SPL there was no risk associated with its storage that could not be overcome through appropriate design.*'



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Waste Stockpile circa 1991

- Mixture of ~100000t of Spent Potlining and ~90000t of unknown smelter wastes



(19)



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This photo is the stockpile without the nice clay cap and grassy cover. That's what is in the capped waste stockpile.

We estimate there to be about 100,000 tonnes of spent potlining and approximately the same, 90,000 tonnes or so of other material. It's certainly not neatly segregated, it's not removed in a nice neat way it was just 'pile it on whichever way you can'.

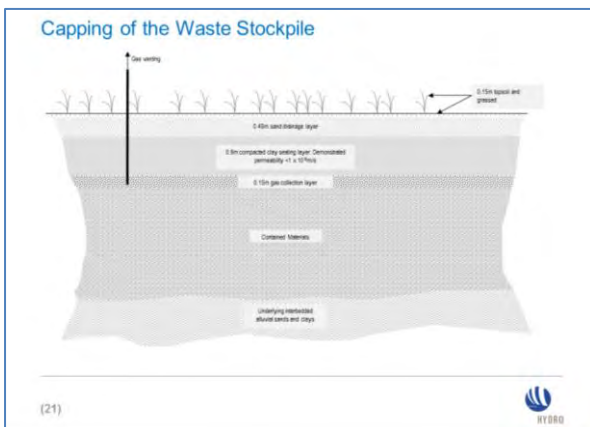
And that has real material implications for what can be done with that material, because it's mixed with other materials it's not spent potlining, it's mixed waste.

Slide 20 shows visually the evolution and capping of the waste stock pile.

Bill Medcalf: In the early days, it was ten years before we lost the first pot.

Richard Brown: So I'm guessing that's the late 70's.

The capped waste stock pile is located on a site, if anyone knows the site, they know it is very close to the wetlands in an area of very shallow groundwater. There is no base to the stock pile; it is just on the ground.



When capped, the capping layer was inserted, with around 0.9 metres of compacted clay and a vegetation cover over the top. It was capped due to localised impact on vegetation and local groundwater.

You can see here (refers to aerial photo – slide 22), and area of vegetation impact where leachate impacted groundwater is coming to the surface.

Impacted ground water relating to the stockpile

There is leachate impacted groundwater coming to the surface from the stockpile. Before being capped, and certainly afterward there is an extensive network of groundwater monitoring wells in operation, monitoring the groundwater system in this location. We have a good understanding of what the impacted groundwater system looks like. From that monitoring we have come up with a concept of how that impacted groundwater is coming to the surface.



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We see that the stockpile is sitting on a complex geology with shallow sandy aquifers and sandy lenses moving in and around that area. There is a very specific area where we can identify the groundwater impacts.

The shallow groundwater table means that as the water table rises after a significant rain event, the impacted groundwater perches to the surface and has an impact in that vegetation area. The impacted groundwater then moves overland, down to the surface receptor, the closest surface receptor is Swamp Creek. However, during that movement overland, it is subject to dilution through natural events – the rain, normal evapotranspiration from trees taking it up, and evaporation. As you'll see the impacts in the local receptors are virtually undetectable.

We have been able to map the plume as it moves through the wells located throughout.

Fiona Robinson: This is not the full set of groundwater wells, just those regularly monitors and located at different depths.

There are groundwater wells that don't detect leachate, only when it comes to the surface.

E3 and E5 are closest to the stockpile. You can see the impact of capping. Prior to capping the concentrations were extremely high; after capping the concentrations dropped. Over the years we are able to see the areas closest to stock pile have reduced fluoride concentrations.

Some wells don't register any concentration. It is very specific, following one of the sand lenses in this area.

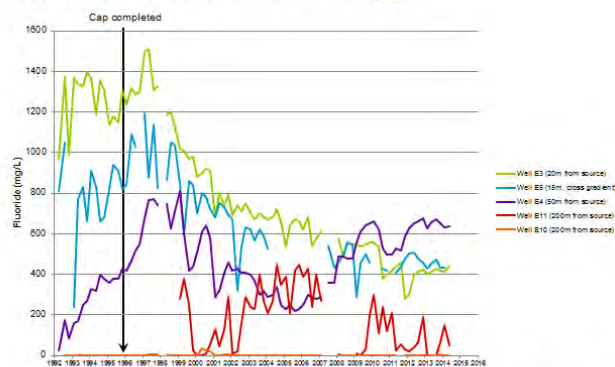
However, even where it plateaus, 400-500 milligrams is still very high concentrations.

Richard Brown: We've recently undertaken works to stop the impact to local vegetation.

Conceptual Model



Fluoride concentrations with time (mg/L)



(25)



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We've Installed a shallow trench and collection system to collect leachate (at a depth of around one metre), and another deeper system to collect leachate impacted groundwater.

To give idea of impacts on surface receptors, here are a limited number of the sites we measure regularly (slide 27) and the median results over the last ten years.

Site A is upstream, and provides our background level.

Site B is immediately downhill of the stockpile. Swamp Creek going to

Wentworth Swamp. Here we had reading of 1.0 milligrams of fluoride.

Interestingly, drinking water has 1.5 milligrams of fluoride. A typical cup of tea has 4.0 milligrams of fluoride.

Other validation of the potential fluoride impacts to groundwater. We've looked and have carried out an ecological risk assessment. A part of this assessment included sampling the biodiversity in an area close to stockpile. We sampled a small pond, located downhill of the stockpile and compared it to another pond located up hill in the bushland away from the smelter. We identified creatures living in both areas. The pond located closest to the stockpile showed no impact in terms of biodiversity.

To sum up our assessment findings: We've carried out assessments through a prescribed process, including desktop assessment, the fieldwork and the analysis that's been done since. The assessments basically said that no unacceptable human health or environmental risk was identified under the current site use. Some materials were considered unsightly or to have management requirements, such as asbestos and the Capped Waste Stockpile.

Ongoing information has been provided to the Environmental Protection Authority (EPA) under our ongoing monitoring requirements under our Environmental Protection Licence, and more recently with investigations around the capped waste stockpile being provided to the EPA, and they have concluded that the site is not significant enough to warrant regulation

Leachate collection systems



(26)



Surface water sampling locations

Last 10 years monthly fluoride sampling median



(27)



Field sampling of ecological health



(28)



Notes

Action

under the Contaminated Land Management Act.

Colin Maybury: Excuse me Richard, you said under the current site use. This means with the smelter shut down?

Richard Brown: Yes. The current site use.

Colin Maybury: Well that's hardly feasible when you've got ...

Richard Brown: It'll be ok Col, we'll get there.

So it means that the EPA haven't looked at the site and said "this is horribly contaminated and requires action taken immediately" under the powers that they have under the Contaminated Land Management Act. They are happy to continue to regulate the site under the existing Environmental Protection Licence.

So that people understand what that means, our Environmental Protection License (EPL), the EPA issue EPLs to owners and operators of sites such as these under this particular Act. It relates to pollution prevention and monitoring. It is inconceivable to imagine that any 'industry' if you like, operating without any impact on the environment, so effectively there are limits where these industries such as ours are able to have emissions, under certain conditions. Those conditions are spelt out in the EPL. The types of activities that the EPL specifies can be varied, so where our EPL had smelting related activities as the main activity, that activity has been changed to suit more of our future requirements and that's about the demolition and remediation of the site. They also are able to have special conditions placed in them, as an example our EPL has the installation of that groundwater interception system and reporting on the leachate impacted groundwater as special conditions within the EPL. That's something that the EPA can require any holder of a licence to do.

Our EPL is in the public domain and available on the EPA website for anyone to download and look at what the terms and conditions are, and what our monitoring requirements are.

<http://www.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=1548&id=1548&option=licence&searchrange=licence&range=POEO licence&prp=no&status=Issued>

Assessment findings

No unacceptable human health or environmental risk was identified **under the current site use**. Some materials were considered unsightly or to have management requirements (eg asbestos and Capped Waste Stockpile).

Data has been provided to the EPA for review. The EPA concluded that the site is **not significant enough to warrant regulation** under the Contaminated Land Management Act and that regulation can continue under the existing Environment Protection Licence.

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Environment Protection Licence (EPL)

- The Environment Protection Authority (EPA) issues [environment protection licences](#) to the owners or operators of scheduled industrial premises under the [Protection of the Environment Operations Act 1997](#) (POEO Act).
- Licence conditions relate to pollution prevention and monitoring
- May be varied to suit types of activities eg. Smelting vs Demolition/remediation
- May have special conditions or investigations eg. Installation of leachate interception system and Report on Leachate impacted groundwater
- Kurri Kurri Smelter's EPL (1548) is available at:
<http://www.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=1548&id=1548&option=licence&searchrange=licence&range=POEO licence&prp=no&status=Issued>

(30)




Mid-point questions

Michael Ulph: That's slide thirty. We are half way through the presentation. Are there any questions?

Clr Arch Humphery: The EPL license applies to just the plant, not 4,000 acres? But to emissions from the plant when it was operating?

Richard Brown: That's not necessarily the case. It applies to activities on the site, which can be defined as the whole lot. It is not, at the moments it's quite a lot of it, particularly around

| Notes | Action |
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| <p>some of the activities that we are planning on doing to remediate, like the Wangara site, and places like that. That's included within the EPL.</p> <p>Alan Gray: When you mentioned about the Klein Street site and at Bloomfield, was that buried in the open cut or an underground mine?</p> <p>Richard Brown: I wasn't here, but what I understand is that the refractories were placed underground. Klein Street is a different story and I'm not certain of the details around how the material got there other than the fact that it is there, and did get there.</p> <p>Bill Metcalfe: I know who put it there.</p> <p>Mrs McGee: and I know how we've suffered because of it too.</p> <p>Alan Gray: I wasn't sure if it was open cut or underground.</p> <p>Richard Brown: So to move on and I appreciate where Colin was going, is to understand the terms and conditions of existing use of the site.</p> <p>The existing use at the moment is exactly as you see it today, that the smelter is closed and there's nothing else. Clearly that is not the future of the site. As I said up front, the remediation of the site is the enabler for the redevelopment of the site. Theoretically, an option for the site, if remediation was not on the cards, we could continue to manage the site as is. But that's not what Hydro are interested in doing. Its remediation is linked to its future use. Both the undertaking of remediation, but also the level of remediation is linked to the expected type of future use. That's why we intend to remediate, because we are looking to allow this site to transition to a new future, to be redeveloped.</p> <div data-bbox="769 855 1366 1274">  </div> <p>Colin Maybury: And it's valuable.</p> <p>Richard Brown: Well yes, it has some value. That's true.</p> <p>The remediation of the Wangara site will commence shortly, and includes the removal of material from the mine subsidence areas, and reinstating clean materials in that area.</p> <p>Rod Doherty: Was the illegal dumping at Wangara recent?</p> <p>Fiona Robinson: It's been there over a period of time.</p> <p>Kerry McNaughton: Only part of the Wangara property is secured. Gates have been secured in the past four to six weeks.</p> <p>Richard Brown: Illegal dumping has occurred in recent times. We have found some asbestos sheeting.</p> <p>Mark Roser: Does remediation involve stabilising underground workings?</p> <p>Richard Brown: No, it doesn't.</p> | |

Remediation planned

Richard Brown: I have touched on the sites requiring remediation. The municipal landfill, Dickson road, clay borrow pit, capped waste stockpile and its impacts, and there are some smelter related sites as well.

Notes

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Bill Metcalfe: How do the dams fit in?

Richard Brown: Dams have been assessed. You can see the dams and drainage lines on the slide here. There are some dams and sediments in dams that require remediation.

Material Streams Identified

In terms of quantities that we've identified.

As part of the process for the future of the site the smelter will be demolished, and therefore generate materials that are not recyclable or re-useable.

We estimate that to be in the order of around 20,000 tonnes.

Contaminated soils within the buffer zone. These are the soils around Wangara, the municipal landfill and other areas around site that I probably didn't touch on, where from historical activities there are asbestos-related impacts in soils, from old houses, chicken sheds and the like, will all be remediated as part of this process. About 40,000 tonnes.

Impacted soils within the smelter footprint itself, 27,000 tonnes.

We currently have spent potlining in storage in the sheds and what's still in the pots, at 79,000 tonnes.

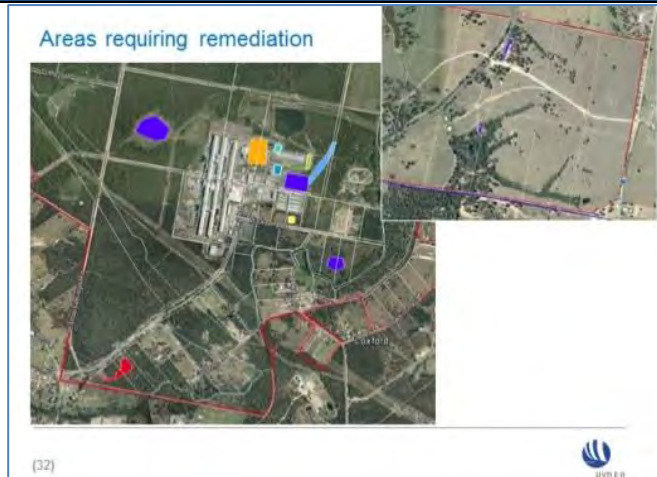
The capped waste stockpile contents, bearing in mind that it's not spent potlining, it is mixed smelter waste, at 189,000 tonnes, and we know that there is the impacted groundwater, that needs to be remediated - that doesn't have a specific quantity.

So in total we have around 350,000 tonnes of contaminated material.

Assessing remediation options

So, with that amount of material the task is to identify how to remediate the site and how to choose a process. It is not a straight forward task. We've carried out a study to understand the options for whole site, both internally in Hydro and with Environ, who have a lot of experience in this space around the globe.

The preferred option has a number of factors that need to be considered including legacy, risk



Material Streams Identified

| Material Stream | Volume and Quantity | Key Materials | Key Pollutants |
|---|---|--|--|
| Demolition wastes | 30,000m ³ 20,000t | • Non-recyclable/ reusable demolition materials | • Asbestos |
| Contaminated soils within the buffer zone | 32,000m ³ 40,000t | • Smelter waste • Asbestos • Municipal and general waste | • Asbestos • Fluorides • TPH • PAH |
| Contaminated soils within the smelter footprint | 17,000m ³ 27,000t | | • PAHs • Fluoride |
| Spent potlining in storage and in pots | Up to 44,000m ³ Up to 79,000t | Spent pot lining | • Fluoride • Cyanide |
| Capped Waste Stockpile | 100,000m ³ 189,000t | • Spent pot lining • Cryolite and alumina • Shot blast dust • General waste | • Fluoride • Cyanide |
| Impacted groundwater - secondary | | | • Fluoride • Cyanide • Dissolved salts |
| Estimated TOTALs | 230,000 m³ 355,000t | | |

(33)

Notes

Action

around not achieving our objectives and remediation works; social impacts and corporate social responsibility; environmental outcomes so that the site can be redeveloped and transitioned. It must be economically viable, permissible by regulators and within a timeframe. It is important to Hydro to have a defined timeframe. We need to get on with the process of remediation and move forward.

We assessed a number of options against a set of criteria. These options included maintaining the status quo which is to cap-in-situ where it lay.

Another option was to upgrade the capped waste stockpile and construct an additional onsite containment cell. Theoretically we could install cut off walls in to the earth, like at the BHP Mayfield site.

We could also send it to landfill, be it domestic waste or a specialist landfill site.

On site waste destruction is another option. The plasma arc treatment can theoretically reduce materials to base elements.

There is also the option of constructing a new cell for housing waste on site.

Each option was assessed against criteria. And each underwent a qualitative or quantitative analysis.

Upgrading the stockpile was assessed to be too high risk; the stockpile is not in the right location and has impacts now. We were not happy with this.

Offsite disposal would mean taking waste offsite, some of which is hazardous, and making it someone else's problem. It is expensive and not socially responsible.

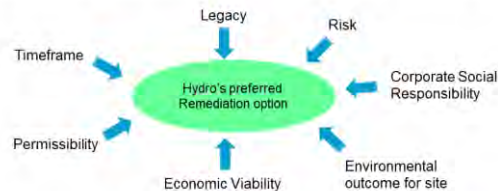
Plasma arc treatment - we have done some investigation into this option. No one has dealt with materials sufficiently, and we couldn't be guaranteed there wouldn't be long term liabilities.

Our preferred is a purpose built containment cell on site. It would be constructed and designed with state of art design criteria, and Hydro maintains ownership of remediation and outcomes of

Remedial Strategy Development Process

Remedial Options Study to identify and evaluate remediation and management options

Workshop process with international environmental and technical experts from both Hydro and ENVIRON evaluated the options against key criteria:



(14)



Alternatives for Whole of Site Remediation

Maintain current (cap in-situ, manage Capped Waste Stockpile, third party domestic processing of Spent Potlining)

Upgrade existing Capped Waste Stockpile combined with a New Containment Cell

Off Site Disposal (landfill)

On site waste destruction (plasma arc treatment)

On site purpose-built **New** Containment Cell

(35)



Assessing Alternatives for Whole of Site Remediation

| | Timeframe | Legacy | Risk | Corporate Social Responsibility | Environmental Outcome for Site | Economic Viability | Permissibility |
|--|-----------|--------|------|---------------------------------|--------------------------------|--------------------|----------------|
| Maintain current (cap in-situ, manage CWS, third party domestic processing of Spent Potlining) | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ |
| Upgrade existing Capped Waste Stockpile combined with a New Containment Cell | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ | ✓ |
| Off Site Disposal | ✓ | ✓ | ✗ | ✗ | ✓ | ✗ | ✓ |
| On site waste destruction (plasma arc treatment) | ✗ | ? | ✗ | ? | ✓ | ✗ | ? |
| On site purpose-built New Containment Cell | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Preferred Remediation Option

Contaminated materials can be treated by macro encapsulation i.e. collected and placed in a new **purpose built containment cell** constructed within the site.

The containment cell would be based on state of the art design, with high quality focus in execution and future maintenance.

Hydro would retain ownership and involvement through all these stages to ensure long term performance.

(37)



the process.

So to break it down. We feel it can be executed in five years and is permissible under current legislation, noting that the contents of the capped waste stockpile and spent potlining are subject to the chemical control order and we currently have a license to store this material. It is amongst the lower cost options, though it is not the lowest cost. In terms of outcomes for the site, it would mean increased protection of sensitive receptors and would consolidate

materials in one location. Hydro retains responsibility, which is our intention.

The cell can be designed and constructed with multiple levels of redundancy, early warning systems, and can include planning for extreme events. It can be managed successfully with the appropriate design and planning, and setting up the appropriate legal structure so that the ownership continues in perpetuity.

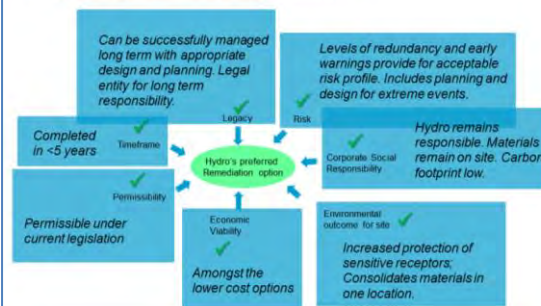
In terms of the spent potlining, we currently have a contract for the reprocessing of

spent potlining, and that can continue until the cell is constructed, so the final volume of spent potlining will only be determined at the point where the cell is ready for receiving materials. The inclusion of spent potlining doesn't change the risk profile of the cell. The capped waste stockpile materials essential have the same properties of the spent potlining, in terms of its hazardous nature. It is economically more viable and the timeframe is more certain.

The reprocessing of spent potlining is highly variable, and the markets come and go. The last thing we want is to have 10 sheds of spent potlining due to no market. Hydro wants to take responsibility and be in control of our long term legacy, including maintenance and funding.

So, what would it look like?

Why is a Containment Cell preferred?



[38]



Why include Spent Potlining in a Containment Cell?

- * Contract for reprocessing Spent Potlining can continue until the containment cell is constructed. The final volume of Spent Potlining requiring containment depends on the amount reprocessed in the intervening period.
- * No change to risk profile compared with cell including contents of Capped Waste Stockpile
- * Significantly more economically viable
- * Timeframe is certain allowing for site redevelopment
 - From experience the market for processed spent pot lining is extremely variable and Hydro does not want to be left with the responsibility of dealing with a stockpile of unprocessed (or processed) spent potlining in 10 or 20 years time because there is no viable market or local processing is no longer available.
- * Hydro retains responsibility for the long term legacy, including provision of maintenance and appropriate funding

[19]



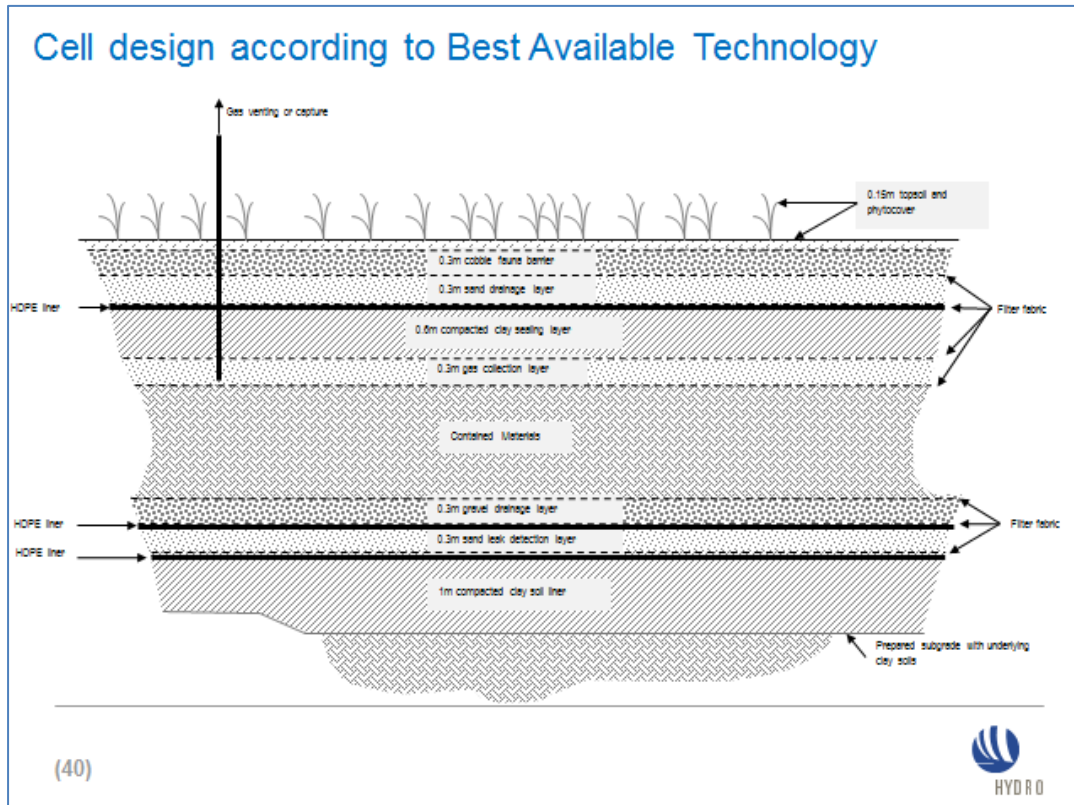
Cell design and construction features

- Minimise infiltration by:**
 - Dual capping layers
 - Phytocover to maximise evapotranspiration
 - Sub surface drainage
 - Triple base lining
 - Leak detection and leachate treatment as contingency
 - Dedicated monitoring and maintenance procedures
 - Quality assured construction
- Minimise impacts to groundwater by:**
 - Competent geology
 - Attenuation layer present
 - Minimum distance above groundwater table
 - Minimum distance from surface water receptor
- Minimise gas generation by:**
 - Emplacement procedures
 - Venting and monitoring
 - Gas capture and use where gas concentrations allow
- Maximise longevity by:**
 - Design for extreme events
 - Liners proven compatible with materials contained
 - Design of 100 year life
 - Provision for upgrade/replacement.

[20]



It has a triple lining. These are concepts (shown in slide 40). The base is compacted clay, it



has a leak detection system, high density plastic sheeting. It can be designed to contain materials placed in specific cells within cell layers. There is sand drainage, fauna barriers, and vegetation cover. Vegetation cover is designed to help operations; it removes moisture from rain and lowers risk of infiltration.

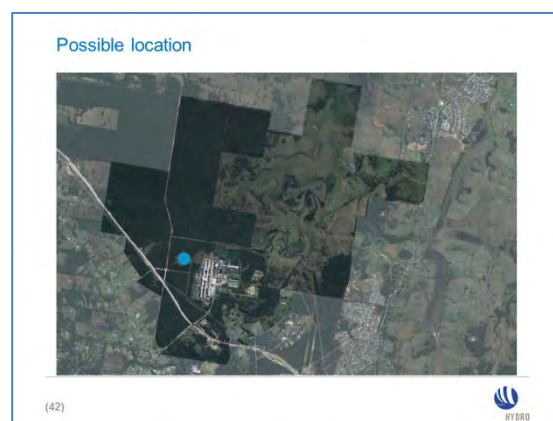
Potential features of the cell include: capping layers, subsurface drainage, and leachate treatment can be applied if required. It would be quality assured construction and Hydro would watch and ensure it is constructed well.

Location is also important. The current stockpile is not on a good site. Other sites on the place are far better. It would minimise gas generation as spent potlining when wet generates gases. Venting can be designed into the cell. The current stockpile has venting now, and methane levels are extremely low.

Liners would also be installed for extreme events, and there would be a provision for upgrade and replacement over the operational life of the cell.

The location, if possible would be the clay borrow pit, which is where clay was sourced to cap the waste stockpile. It is a suitable site.

The question in peoples mind is probably this: You have a stock pile, which is not functioning well. What's different?



Notes

Action

Well, location, the clay borrow site has the ideal geology. Also the engineered base liner and levels of redundancies which would be designed into the cell, also the fauna barriers. The stockpile was placed without planning; it has mixed materials with no order. We have the ability to control where the cell is placed, and what's placed in the mini cells within the cell. In terms spent potlining, ongoing leachate management is a consideration, as this cell would also allow us to fix up the leachate contamination from the current stockpile.

Containment cell v capped waste stockpile

| Capped waste stockpile | Containment cell |
|---|--|
| Stockpiled in a location with shallow groundwater conditions and poor soils | Located at a site with ideal geological, topographical and hydrogeological conditions |
| No base to stockpile, leachate enters groundwater | Engineered base liner, including early warning leachate detection |
| Capping layer | Capping layer including fauna barrier, HDPE layer and seal bearing layer |
| All materials mixed together | Wastes placed in separate cells with specific management measures during placement and containment |
| Ongoing leachate and groundwater management required | Allows groundwater affected by stockpile leachate to be effectively managed |

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Probably what's interesting is that this type remediation is not unusual. The containment of contaminated material, while it is not standard practice is well used across small and large remediation projects.

There are examples of containment cells about, such as at Carrington, and the Charlestown sports oval, as well as the Former Pasminco site which is dealing with around 1.5 million tonnes of contaminated materials. One of the most famous areas is the Sydney Olympic Park which has containment facilities across the site.

Colin Maybury: Isn't that leaking?

Richard Brown: There are lots of them. [examples of containment cells] and there is proposed development across the site.

So where to from here?

We've done site assessment, and worked through the process to develop a responsible remediation strategy. Essentially we'd like to move forward. Process required is regulatory approval, which we're about to embark upon. It is most likely to be considered a State Significant Development.

We've carried out the site investigation, assessed options, and undertaken preliminary environmental assessment with the intention to submit to the Department of Planning and Environment (DPE) to receive our environmental assessment requirements. DPE will consult with at

a range of interested stakeholders in the process, and will prepare a set of requirements to

Existing containment cells



Carrington



Charlestown



Former Pasminco site

(44)



Existing containment cells

Sydney Olympic Park and surrounds



Proposed medium-high density development, Wentworth Point



(45)



Notes

Action

cover in the Environmental Impact Statement (EIS). The EIS that is prepared includes a formal public exhibition process. This also bears in mind that you're in this with us all the way through, but there are formal consultation stages as well. After the exhibition period, public submissions will be reviewed and the project assessed. Ultimately, we hope the project is approved and executed.

Michael Ulph: What's the timeframe for that process?

Richard Brown: As long as a piece of string; regulators tell us to be appropriately pessimistic. We've said approximately two years for planning and approvals. This doesn't include

minor remediation works required, which can be carried out prior. Major works will be at least two years down the track.

Site redevelopment

To go back to the start. Hydro is responsible for a process that enables redevelopment of the site. In later CRG discussions, we will have more discussion about potential use of the site. This work will allow for potential residential and commercial redevelopment and protect biodiversity.

Our preliminary plan looks like this (slide 47). It is quite likely when a more detailed plan is prepared it will look different. We would develop around the containment cell; the cell location will be determined by the best geological site.

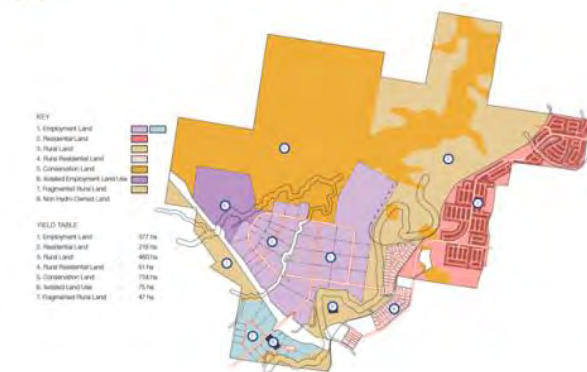
One of the key outcomes is the conservation of land with significant biodiversity value.

If the area supports this level of biodiversity now, we are confident the natural environment here can only get better through remediation of the site.

That's it in a nut shell, and I appreciate that was a lot of info to take in.



Remediation is the enabler for the redevelopment of the site





| Notes | Action |
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| Questions about site contamination and remediation | |
| Michael Ulph: Are there any questions? | |
| Mrs McGee: Does a Remediation Action Plan have to be drawn up? Is it drawn up in consultation with the EPA? | |
| Shaun Taylor: The RAP goes hand in hand with EIS, and forms the basis of that EIS. | |
| Arch Humphrey: Do you intend to remediate the whole site, or say do some of the residential land first (say Gillieston Heights) and then proceed in terms of the varying types of potential use? Are you looking at those and saying they are the most cost effective to remediate, to do first and dispose of that land. Or are you planning to remediate the whole site before anything else. | |
| Richard Brown: We are looking at remediate the residential area near Gillieston Heights in the short term. If they are validated as ready for redevelopment for residential use, theoretically if ready for rezoning these sites could potentially be sold off. Contaminated material could be taken back to the smelter site for later management. | |
| Arch Humphrey: On zoning and rezoning: Do you have a plan to approach Council to potentially look at rezone certain sites? You can have a view, but you need approval. You need to understand what the future is, before spending the money. | |
| Richard Brown: Yes. We have had detailed dialogue particularly with Cessnock Council, with the Department of Planning regarding pending growth and the infrastructure plan, and, while they haven't said if we are in or out, we have nominated the site in that plan. | |
| Alan Gray: What about both sides of swamp creek? Have you thought about a causeway, a second egress? | |
| Richard Brown: Not sure Alan | |
| Michael Ulph: Let's hold this one over as this session is more focussed on contamination. | |
| Bill Metcalfe: What about the size of the containment cell? | |
| Richard Brown: You're talking about approximately twice the size of the existing capped waste stockpile. How that's structured and built remains to be planned. It can be square, round, and theoretically can have an adaptive reuse, like the previous examples. Whether or not that's suitable or not in this location, I don't know. There are lots of sporting fields built on old tips for instance. | |
| Are there any questions on this presentation? | |
| Bill Metcalfe: Regain are out the back processing SPL now. Are they going to increase the size of their facility, or will it stay the same? | |
| Richard Brown: You'd have to ask Regain that Bill. We have an agreement with Regain. Unfortunately the contents of that agreement are confidential, and I can't go into too many details about that. Hopefully neither can they, it's a mutual agreement. | |
| Questions from Colin Maybury | |
| <i>Mr Maybury had several questions about contamination and remediation on the Hydro site that he put to Hydro and to the Chair during the weeks before this meeting. It was suggested that the CRG could benefit from hearing his questions and their answers, and that some may be answered during this evenings' discussion on contamination and remediation. The Chair arranged for a fifteen minute period in the agenda for Colin to ask questions and have them answered.</i> | |
| Michael Ulph: OK, well thank you very much for that. It's now 7:25pm, but we'll proceed. So | |

Michael Ulph to identify questions and arrange responses from Hydro.

| Notes | Action |
|---|--------|
| Col are you OK to go? | |
| <p>Colin Maybury: Yes. Three questions: Where have we come from, where should we be, and where do we want to go?</p> <p><i>Colin read out a four page statement detailing his understanding of a large number of historical and some current issues /situations. He also provided 21 photographs along with a list of titles for each one, and a two page printout from Wikipedia with the headings 'Chemical Properties of SPL', and 'Issues with Landfilling SPL'. The statement, photographs and their headings, and Wikipedia pages are provided as an appendix to these minutes. The Chair and Hydro have an action item – to respond to assertions and questions put by Colin in the statement.</i></p> <p><i>During the course of the approximately fifteen minute reading there were several comments, with are detailed below.</i></p> <p>Michael Ulph: I am conscious of time Col, if you have a formed question.</p> <p>Colin Maybury: You can't have an hour and a half ...</p> <p>Michael Ulph: I'm just looking for a question.</p> <p>Colin Maybury: You're not going to get a question, you're getting an explanation.</p> <p>Michael Ulph: Oh, I'm sorry, alright proceed.</p> <p>Colin Maybury: Please stick with me and you might learn something.</p> <p><i>Later</i></p> <p>Michael Ulph: Will you be able to give us a copy of that, to save Janita from typing it now?</p> <p>Colin Maybury: Certainly, I have a copy for everyone, and photographs.</p> <p>Michael Ulph: Thank you.</p> <p><i>Later: Colin mentions the name of a person being arrested for cutting up stolen ingots.</i></p> <p>Bill Metcalf: He wasn't. It wasn't (name)</p> <p>Kerry McNaughton: It wasn't him it. He may have had the company, but he wasn't responsible.</p> <p>Bill Metcalfe: No it was his son.</p> <p>Colin Maybury: Sorry about that, just cross out (name).</p> <p>(CRG member) Careful, ICAC will get you!</p> <p><i>Later: Colin mentions a protest court case in 1995-6-7 against a Dross Plant in Kurri Kurri.</i></p> <p>Michael Ulph: Sorry the dross plant was</p> <p>Colin Maybury: It is in Kurri on the edge of Kurri</p> <p>CRG Member: Weston Aluminium</p> <p>Michael Ulph: so Weston Aluminium, thank you.</p> <p><i>Later: Colin mentions smelter ponds.</i></p> <p>Colin Maybury: .. and Richard didn't mention those ponds, they have to be treated, they are solidly polluted with both cyanide and fluoride.</p> <p>Richard Brown: What ponds Col?</p> <p>Bill Metcalfe: He mentioned the dams, I asked him about the dams.</p> | |



| Notes | Action |
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| Arch Humphery: He did mention the dams. | |
| Colin Maybury: and I think there's just as much there, as | |
| Bill Metcalf: and he answered the question, he said there's cyanide there and they'll have to be treated, is that what you said? | |
| Richard Brown: Yes. | |
| Colin Maybury: Well, I'm pleased to hear that Bill. | |
| <i>At the conclusion of the statement</i> | |
| Colin Maybury: You'll notice that Richard is saying a hundred years at best for that containment cell. That containment cell is in an earthquake zone. We had a very light earthquake here about five or six years ago, and I came home to find a crack on the cement, through the slab. | |
| It is very very dangerous to try to put this stuff in the ground. So I contain in here, Spent Potlining in Wikipedia and did you know that Kurri Kurri smelter is the only smelter in the world that gets a mention in Wikipedia, it says that they allow the stuff to break down and go into the swamps. | |
| Kerry Hallett: Sorry Col, do you know that the Universities will not allow quoting of Wikipedia because it's not necessarily accurate? | |
| Michael Ulph: That's alright, let him continue please. | |
| Kerry Hallett: I'm just saying, if you want to quote Wikipedia, you've got to quote others as well. | |
| Bill Metcalf: Are they all YOUR facts? | |
| Colin Maybury: I'm reporting what has been passed along to me by people, and my own observances here. | |
| Bill Metcalf: I take offence to you calling people [derogatory comment] and stuff like that. | |
| Michael Ulph: It's ok. | |
| Colin Maybury: I'm sorry you do, I'm quoting what I was told. Anyway the point I'm trying to make is that these photos will show you we are in a very dangerous situation. That situation is trying to be superceded so that they can get out, Norsk Hydro just want to get out. They have had a bad history through much of their operation. They came to prominence as a fertiliser company and then converted over to a generating company and an aluminium company, after [potentially offensive historical statement]. | |
| Michael Ulph: I think we are going back in history a fair way here. | |
| Colin Maybury: Of course we are. | |
| Michael Ulph: I'd just like to say Col, thank you. | |
| Colin Maybury: It's not enough I've got .. | |
| Michael Ulph: Sorry have you finished? | |
| Colin Maybury: No I have a lady here who saw what went on in your remediation over at Weston. | |
| Kerry McNaughton: It's not our remediation Col. | |
| Colin Maybury: Kerry you were the one who told me, tell me where the stuff is, and I will come and dig it up and take it away. | |

| Notes | Action |
|---|--------|
| <p>Kerry McNaughton: Tell me where the stuff is and we'll take it back Col. It wasn't a Hydro project.</p> | |
| <p>Colin Maybury: It WAS a Hydro project.</p> | |
| <p>Kerry McNaughton: We could argue this all night, because I tell you what, basically 95% of your statement Col, is absolute garbage. I ashamed that you have raised some of these questions because listen, 20 years of interaction between you and I, we've got monitoring data support for everything we've been doing at the wetlands, we've got monitoring in the buffer zone. Referring to Mrs [surname], for example, who supposedly passed away from mature age asthma, is a load of [swears]. I'm a little bit upset because Mrs [name], I first met her when she first moved into the buffer zone. She had severe emphysema, with 28% lung function, she survived five years and she died a terrible death. Nothing at all to do with mature aged asthma, she was extremely ill when she moved into the buffer zone and it's an unfortunate passing.</p> | |
| <p>The Bowditch Avenue property for example...</p> | |
| <p>Michael Ulph: Kerry, I'll just take charge of the meeting if that's ok. What I'd like to do, is rather than have an argument in the middle of this meeting when we are over time, is take your written statement Col., we thank you for it, and you have absolutely every right to be heard and to make a statement. I'll make sure that Hydro responds to those statements. We'll look at that statement and we'll try to find particular questions, we'll pull out the statements, and then we'll look at them and respond to them, so you have a proper formal response.</p> | |
| <p>Arch Humphrey: That seems to be the history and it goes back a long way. What we are here for is to talk about what's going on with the license and regulation that apply to remediation. While the documentation provided by Colin might be interesting to people, we must be careful not to get off track because this is about remediation and it doesn't matter how it got there it is about remediating under licence conditions.</p> | |
| <p>Colin Maybury: That's not necessarily so. I'm telling you that it was 1300 parts per million just outside the fence, and that was pumped back into the plant. A lot got in to swamps, and at one stage, and I think Kerry will back me on this, I saw 67 parts per million of fluoride in the swamps from the testing you did in the swamps.</p> | |
| <p>Kerry McNaughton: Incorrect.</p> | |
| <p>Michael Ulph: Thank you Colin for your description. We're over time.</p> | |
| <p>Colin Maybury: I have Mrs McGee here to talk about her experiences living near Weston.</p> | |
| <p>Michael Ulph: Okay, Mrs McGee thanks for coming along today.</p> | |
| <p>Helen McGee: All I want to say is that you say remediation will take five years, but I'm into my third year of remediation and it's about one hectare. I think you need to do your sums there. It has been an absolute disaster and it impacted greatly on the health of residents. I live several metres away from the actual site [referring to Kline St. Weston], and was not advised the land was contaminated, or that remediation was being carried out. The first we heard was when an earthmoving company came on the site and started digging a massive hole, it released an absolutely ghastly gas, that really impacted on several of the residents, including myself. It caused my lips and tongue to swell, my throat to burn and my eyes were bulging. Since then there have been people complaining of severe asthma attacks, breathing attacks and everything else. The remediation action plan (RAP) was thrown out the window on day one.</p> | |
| <p>Michael Ulph: OK so what I've heard a little earlier is that Hydro did not have responsibility for the Remediation Action Plan, but another company did, can you tell us ...</p> | |
| <p>Helen McGee: I'm not saying Hydro did, on listening to you tonight I'm hearing that the spent potlining was dumped illegally on that site almost 40 years ago, left to stew underground and</p> | |



| Notes | Action |
|--|--------|
| <p>no-one knew anything about it until this earthmoving company turned up and started digging this hole. It was all done completely underhanded and residents have been severely impacted. We've had massive trouble with Cessnock Council and the EPA trying to get assistance in any way. We had to recently go through the Environment Defenders Office to force the Council make the developers to come back because they abandoned the site on two occasions and left massive holes. The amount of dust blowing over people has been immense; it has been a major problem. It's caused major breathing problems for people, and trying to get our message out to people out there has been absolutely outrageous.</p> | |
| <p>Michael Ulph: Thank you. I will throw Richard on the spot here. I understand that this initially started about 40 years ago.</p> | |
| <p>Helen McGee: That's right. It was supposed to be remediated over 3 to 4 weeks by the way. We're into our third year.</p> | |
| <p>Michael Ulph: From Hydro's perspective then Richard what's your understanding of the situation there?</p> | |
| <p>Richard Brown: Well. It's difficult. I can't defend how it got there, and don't know exactly what it is. Clearly it contains smelter materials and not just inert refractories there are anodes and spent potlining in that material. It is certainly not all spent potlining, which I can tell you as we've received the material on site. The vast majority of it is soil and bricks.</p> | |
| <p>Helen McGee: Well, excuse me but the environmental person running the remediation told me that the report carried out by GHD in 2003, which estimated the amount of spent potlining was grossly underestimated, and there was much more spent potlining found on the site than first imagined, that is why we've gone into three years.</p> | |
| <p>Richard Brown: I can only say from seeing it, that's all. We've got it piled up over the back, so I know what's there. And the other thing to know is that it's not Hydro's land. We don't have any specific regulatory responsibility over the site, however ..</p> | |
| <p>Colin Maybury: Richard you put it there.</p> | |
| <p>Richard Brown: Sorry</p> | |
| <p>Colin Maybury: You put it there.</p> | |
| <p>Richard Brown: I didn't put it there.</p> | |
| <p>Colin Maybury: The smelter did.</p> | |
| <p>Richard Brown: We recognise that the material is from the smelter, and that's why we've received it back.</p> | |
| <p>Helen McGee: Actually it was reported in the media just recently that the smelter, one of the options it's looking at to get rid of the spent potlining on this site, is to put it in landfill, and if you do that when it's only metres from houses you are making a huge mistake.</p> | |
| <p>Michael Ulph: Mrs McGee, you've just seen a presentation explaining that it's not about landfill...</p> | |
| <p>Michael Ulph: Thank you for your statement also.</p> | |
| <p>Helen McGee: I'm not saying it's Hydro's fault, but residents have now paid the price, big time.</p> | |
| <p>Michael Ulph: The important message is that it needs to be managed professionally. These people here can oversee this process and Colin can be your conduit of information and ensure Hydro acts responsibility. The EPA will be involved also.</p> | |
| <p>Helen McGee: We were let down by Council and the EPA, who were bouncing the ball. It took</p> | |



| Notes | Action |
|--|--------|
| 20 months for Cessnock Council to take control. | |
| Colin Maybury: I have one mistake in there, I used 350,000 tonnes of spent potlining, and from it deduced that there was 38,150 tonnes of fluoride and 238 tonnes of cyanide. From what Richard said that's not necessarily the case because there was a lot of other stuff mixed with it, but that doesn't take into account the ponds that are saturated with material. | |
| Michael Ulph: Thanks everyone for bearing with us. Colin is obviously carrying a lot with him and it's important that he is heard. We've given him that forum tonight and I thank you for respecting his time to do that. You do need to be careful about slander and libel laws. There is a name in that document that has been disputed. We'll go through Colin's documents and respond in an appropriate manner. | |
| Alan Gray: Colin has identified other sites, now Hydro has said they are willing to investigate other sites where evidence is shown. That's an important point to make. | |
| Helen McGee: We do acknowledge that Hydro agreed to take the spent potlining back. | |
| Debra Ford: It is past people who have done that illegal dumping, if anything we have to give these people gratitude for taking that material back. | |
| Michael Ulph: OK I will try to have conversations through the chair in future please. It is about five minutes to 8, I appreciate your time everybody. I'll try to get these minutes out as soon as possible. | |
| The next meeting that we have planned is September 18 th at the same time. | |
| Thanks again for your attendance. | |

Next meeting: Thursday 18 September from 6pm.

Janita Klein

GHD – Stakeholder Engagement



Appendix.

The following pages are those supplied by Mr Colin Maybury of Kurri Kurri Landcare.
The statements on the pages have been put forward as observations and reporting of information to Mr Maybury.

Note that Mr Maybury ends the statements with the sentence:

“This statement is correct to the best of my knowledge please advise.”

Hydro has committed to responding to questions and statements where possible, and will do so as soon as practical.

Note that some names have been deleted as Hydro cannot verify accusations against people, and does not wish to be complicit in slandering any individual.

NOTE:

These minutes of the August CRG meeting were distributed in their draft form to the CRG for review, as per the agreed process, on 11 September 2014.

On 12 September 2014, Colin Maybury sent the following email to Hydro Kurri Kurri Managing Director Richard Brown, copying in Michael Ulph and Kerry McNaughton.

“Richard, Kerry, Michael, I hereby withdraw my comments and reports from residents and apologise for any angst I may have caused. Col.”

A response to the attached statement was provided by Hydro to the CRG at the September meeting. It is included in the September minutes.

SMELTER HISTORY AND THE CRG.

WHERE HAVE WE COME FROM? WHERE SHOULD WE BE?

WHERE DO WE WANT TO GO?

SPENT POT LININGS: Read <http://www.environmental-expert.com/products/spent-potliner-management-123947> , A common challenge for many companies within this industry and in many countries, this waste has been identified as an extremely problematic hazardous waste.

It contains concentrations of cyanide and fluoride and gives off noxious and flammable gases when in contact with moisture. These contaminants readily 'leach' into the surrounding soils and groundwater during both short term and long term storage.

They can cause potential contamination of drinking water reserves. Because of this concern, SPL must be managed and disposed of in an appropriate manner.

As a contractor, an Electronics Instrument Technician, based in Newcastle but born in Weston, I began working at the smelter in 1969 before it became operational.

My company built specialist electronic measuring and control equipment for the potline, set up parts of the carbon plant, the ring furnace, the air system, the scrubbers, the casting tables and furnaces.

We repaired the ingot ultrasonic flaw detectors. Highly specialised analysers of the huge ingots. Flaws that could spoil an expensive extrusion.

I saw the growth of Mt Alcan a multi hundred thousand tonne pile of highly toxic Spent Pot Linings. I heard stories of the dumping of smelter waste including SPL around Kurri. I watched all the trees on the west side of the plant compound die from fumes. Potline 2 went in there later.

The engineer in charge of sealing the bottom of the pile with neoprene, I seem to remember, complained to me that they were having trouble gluing the sheets together.

I immediately saw the danger and said, " [REDACTED] that pile is over sandy soil and above the creek and the swamps you had better seal it." Later the fluoride in the water table went up to 1300 ppm. 4ppm in water is the danger level I understand?

Cyanide and fluoride went through the waterways to Hinton measuring station I am told. I had as a youth swam, hunted and canoed on the swamps. It was then a huge breeding area for birds and fish.

[REDACTED] it is claimed was the rogue trucky with his employees who dumped smelter waste in Weston, Neath, Aberdare South (Siberia), down that deep shaft and Hebburn No2 mine shaft. In the East Greta No1 mine void. The smelter noted all shipments in its gate movements?

[REDACTED] was arrested cutting up stolen ingots with a chain saw at his home at [REDACTED] [REDACTED] after neighbours complained to police about the noise.

Not only was he an illegal dumper with the smelter's assistance but a thief as well bringing out ingots under the SPL and selling the aluminium as scrap.

█████ later excavated for me at my Kurri home building site and I found him to be untruthful and cunning. I was pleased to get rid of him.

█████ dumped 1,400 tonnes of smelter waste and SPL into a 5 metre deep ravine in central Weston according to the Remediation Action Plan by DLA.

In 1997 after complaints about years of fumes and acidic odours the site was tested by the smelter. No smelter waste they claimed. In 2003 GHD, Michael's company again did a survey. They discovered what was there. It is in the Remediation Action Plan.

Around 2010 GHD removed a huge waste dump at Clark and Rawson Sts Weston beside Hebburn Dam and above Peace Park. Was that Smelter Waste?

In 2012 the 1400 tonnes was dug up and some removed by the developer and the smelter. Because it was in winter the westerly winds carried the waste including the toxics named in the RAP into the centre of town. This happened again and again over two years of resident torture.

The smelter waste included PaHs, BaPs, Heavy metals, TPHs, inorganics Fluoride and Cyanide. In the centre of homes. It posed a risk to health, and there was a risk of impact on groundwater and migration. So it is claimed in the Remediation Action Plan. But it was not all removed for 2 years and 3 windy seasons till late in July 2014.

400 tonnes or 30% as I was told by the developer, remained on site. The smelter has since removed the remaining 400 tonnes.

The waste was left on site above ground covered with a veneer of soil to camouflage its presence. The developer said he was wanting to sue the smelter.

All this was allowed by a consultant site manager who was extremely incapable of following the remediation plan, it seems. The blown waste and dust had to be seen to be believed. The residents were extremely affected but not consulted or acknowledged.

For over 40 years smelter pollution particularly fluoride, a very dangerous poisonous waste, was spreading over the land. "The Buffer Zone."

Your photos show a serious bright red weed infestation over the swamps. What is it? It is Hydro's Buffer Zone that they now wish to sell.

The dangers of airborne fluoride and cyanide in the water are suitably chronicled.

E.g. Eve Giles's cattle were visibly affected 4-5 kms from the smelter. Kerry McNaughton took photographs for many, many years of her cattle's twisted and distorted teeth and misshapen bodies as well as fluoride measurements of soil, water and foliage.

At Wangara downwind of the smelter a herd of cattle were kept to monitor their tail bone fluoride. The testing vet owned the cattle, it is claimed and did his own testing before selling

the cattle into the food market. A conflict of interest? Surely? But worse was claimed. He bought the cattle from fluoride free areas in calf.

After birthing the calves were kept for 2-3 years and tested and sold. This system was it is claimed not a real test but was accepted by the EPA? Did they know it was being engineered? The soils and foliage of the Wangara area are probably heavily polluted.

In 1995-6-7 we locals were involved in a protest court case in the Land and Environment Court against a proposed fluoride producing Dross Plant in Kurri Kurri. The smelter owned many houses in the Buffer Zone and did not tell the tenants.

With others I conducted an over 30 appearances court case against the Dross Plant in the Land and Environment Court and Supreme Court. We protested that the smelter had not told the tenants across the Buffer Zone of the coming fluoride producer.

The law was changed. It became mandatory that landlords tell tenants of environmental issues that may affect them.

A little 3-4 years old boy in a smelter house in Bowditch Rd Loxford was affected badly, headbanging etc. by the air borne pollution from the uncovered stockpile of SPL.

His mother applied for help saying the smelter had ignored her. After Garvan Institute testing I suggested moving and the family did. The little boy improved within 6 weeks and the house was immediately demolished. See Google Map photo.

The TAFE grape vines part of the Viticulture Course immediately south the boy's house were badly affected by windblown pollutants from the plant and Mount Alcan and it was necessary to dilute the grape juice by fluoride free grape juice 50/50.

The Mt Alcan pile of SPL was covered with soil around this time and vents were installed to relieve the gas pressure inside. Pumps were installed east of the pile outside the fence to suck up the leachate. The toxic leachate was pumped back into the smelter ponds.

It is still there awaiting treatment.

3 or more houses on Bowditch Road Loxford were removed, see the pre expressway map. There were no vents at the Weston illegal dumps to relieve the pressure and toxic gases.

It is claimed that 5,000 tonnes of Spent Pot Lining was included in the pavement of the Hunter Expressway. ARRB road making consultants on the HE project claim they used recycled pot lining from smelters.

Kerry McNaughton and presumably Richard are fully aware of all these transgressions. We have asked Michael for an explanation of the red weed spreading in the swamp areas. .

I include photos of the pre Hunter Expressway SPL open air sorting piles and the same piles now severely eroded by leaching and wind power. As Wikipedia attests fluoride enters the body by ingestion or respiration.

It was common knowledge that the smelter did not acknowledge compensation claims and pay outs. The amounts awarded were subject to a contracted silence. I spoke to a Ring Furnace operator dying from lung disease awarded \$80,000, and silenced by contract.

A man who lived on Hart Road about 600 metres from the smelter gate cried as he told me of his wife choking to death from a pollution created Mature Onset Asthma attack not long after they moved in circa 1996-7.

The smelter at that time was going to cast iron rodding and failures of the anodes was common during the changeover creating huge clouds of toxic pollution that covered the northern slopes of Kurri Kurri in a huge dusty cloud.

The smelter in 1997 was fined \$100,000 for 3 exceedences of licence, events. The judge, [REDACTED], stated the smelter showed no contrition. The smelter made a profit of \$42 million dollars that year.

The smelter has historically been subsidised with cheap electricity. Roughly equating to \$39 million in that polluting year. The land Hydro now wants to sell to greedy developers was in large part gifted to the smelter and the plant received electricity subsidies from the state government claimed to be equal to \$75,000 per employee per year.

The Federal Minister for the Environment introduced by the Local member Joel Fitzgibbon opened a Spent Pot Lining treatment Plant on behalf of Regain a company that claims to treat SPL and sell it as feedstock to cement plants for \$50 per tonne.

They claim they are paid \$500 per tonne by the smelter to process the SPL. Norsk Hydro Norway claim they have a profitable way of making the SPL into feedstock for Rockwool International. Why are they not using it on the 45 year old stockpile here? Why?

See Joel Fitzgibbon MP on Youtube bemoaning the fact and his supporters.

There are; <http://www.cessnockadvertiser.com.au/story/2390526/hydro-assesses-options-for-site-remediation/> potentially 350,000 tonnes of Spent Pot Lining on site.

Alcan claim to have a developing plant for treating SPL. The projected cost \$120 Million Canadian.

Hydro has hired the "spin doctors " to give their message to the press etc.

[REDACTED] to save the media? www.fordcomm.com.au/about/our-team ?

Our CRG " facilitator " from GHD claimed to be a facilitator for AGL who are presently attempting to drill gas extraction wells in Gloucester. The locals are strongly opposed. I asked senior opponents of AGL their opinion of the facilitator. One claimed he is a [REDACTED], another a former mayor of Gloucester claimed " Our big mistake was in allowing [REDACTED] to take the only minutes. We should have taken our own."

I appeal to all members of this Community Reference Group to study these photographs. To deny this twisted company, Hydro, the opportunity to bury this toxic waste SPL and to clean the site themselves under inspection. We cannot allow our children or grandchildren to have health and cost problems dealing with these pollutants in later years.

Signed: Col Maybury Kurri Kurri Landcare 02 4937 4664 0427 889 653.

This statement is correct to the best of my knowledge please advise.

SPENT POT LINING IN WIKIPEDIA

http://en.wikipedia.org/wiki/Spent_potlining

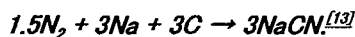
SPL is hazardous due to:

- *Toxicity from fluoride and cyanide compounds that are leachable in water*
- *Corrosive - exhibiting high pH due to alkali metals and oxides*
- *Reactive with water in a way that produces inflammable, toxic and explosive gases.^[12]*

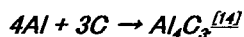
An example of the potential consequences of SPL reaction with water is the death of two workers and reported damage costs of \$30 million due to an explosion of flammable gases from SPL in the hold of a cargo ship.^[12]

The leachable fluorides in SPL come from the cryolite (Na_3AlF_6) and sodium fluoride (NaF) that are used as a flux in the smelting process.

Cyanide compounds form in the pot lining when nitrogen from air reacts with other substances. For example nitrogen reacting with sodium and carbon according to the equation –



Aluminium carbide forms in the potlining from the reaction of aluminium metal and carbon according to the equation –



Aluminium nitride forms from a number of reactions including the reaction of cryolite with nitrogen and sodium according to the equation –



Gases are generated from reactions of water with compounds such as un-oxidised aluminium metal, un-oxidised sodium metal, aluminium carbide and aluminium nitride. Typical gases from the reaction of SPL with water are:

- *Hydrogen from aluminium metal and water – $2\text{Al} + 3\text{H}_2\text{O} \rightarrow 3\text{H}_2 + \text{Al}_2\text{O}_3$*
- *Hydrogen from sodium metal and water – $2\text{Na} + 2\text{H}_2\text{O} \rightarrow \text{H}_2 + 2\text{NaOH}$*
- *Methane from aluminium carbide and water - $\text{Al}_4\text{C}_3 + 6\text{H}_2\text{O} \rightarrow 3\text{CH}_4 + 2\text{Al}_2\text{O}_3$*
- *Ammonia from aluminium nitride and water – $2\text{AlN} + 3\text{H}_2\text{O} \rightarrow 2\text{NH}_3 + \text{Al}_2\text{O}_3$ ^[16]*

ARRB Consultants to The Hunter Expressway Project.

<http://www.arrb.com.au/Infrastructure/Pavements-materials.aspx>

The Austroads Guide to Pavement Rehabilitation, and our Sealed Local Roads Manual provide information about recycled materials and design processes and techniques adopted by road authorities.

Recycled materials in concrete:

- ***recycled pot lining from smelters***
- ***recycled glass***
- ***recycled concrete aggregate***

JOEL FITZGIBBON MP MEMBER FOR HUNTER.

Member for Hunter Joel Fitzgibbon has called on Hydro to publicly commit to the reprocessing of toxic spent pot-line waste.

Mr. Fitzgibbon raised the issue in parliament on Thursday after hearing that Hydro planned to bury the spent pot-lining in a disused mine in the Hunter – a claim quickly refuted by the company.

Mr. Fitzgibbon stood firm on his view that treating the waste is the only option.

“Reprocessing in government-approved facilities with environmental controls is the only safe way of disposing of the waste,” Mr. Fitzgibbon said.

“Expensive yes, but it’s the only safe option.

“The company has confirmed that landfill, both on-site and off-site, remains an option.

“On behalf of the community I say it’s not an option at all.

“Norsk Hydro took a decision to exit our community; they must now meet their obligations to do so responsibly.”

SEARCH YOUTUBE FOR JOEL FITZGIBBON MP ADDRESSING THE FEDERAL PARLIAMENT.

ON YOUTUBE:

Joel Fitzgibbon July 1st 2014-08-17

Here is Norsk Hydra patting themselves on the back by a media release about how they are recycling” toxic “ Spent Pot Linings in Europe but talking landfill here.

From Waste to Resource

Hydro has signed a contract to supply SPL from the production of primary aluminium to Rockwool International, a producer of firesafe insulation. The agreement insured that pot linings will be reused to benefit both the

Is there a sensible way to recycle our...If so we should be doing it.

I worked with that same sort of waste as a contractor at the Tomago smelter 20 odd years ago. Some of it was dumped at the brickworks quarry at Metford with the worst of it stored in massive sheds on site because they didn’t know what to do with it.

Don’t let public health get in the way of making money.

Typical make your money dump your workers and leave the vile rubbish for others to worry.

**COMPLAINT TO KERRY MCNAUGHTON OF HYDRA OVER AGL "ILLEGAL?" DONATIONS TO THE
LIBERAL PARTY?**

Hi Col,

I've forwarded your email to Richard.

Regards,

Kerry

Kerry McNaughton
Environment Officer/Buffer Zone Supervisor
Hydro Aluminium Kurri Kurri Pty Ltd
PO Box 1,
Kurri Kurri
NSW 2327
Australia
Direct Phone (61 2) 4937 0667
Direct Fax (61 2) 4936 1418
Mobile 0408 863 185
Email kerry.mcnaughton@hydro.com

Col Maybury <cma45714@bigpond.net.au>

12/08/2014 04:45 AM

To Col Maybury <cma45714@bigpond.net.au>, Kerry McNaughton
<kerry.mcnaughton@hydro.com>, Joel Fitzgibbon
<christine.boyd@aph.gov.au>, frances fiveash
<franfiveash@yahoo.com.au>

cc

Subject Secret AGL political donations while seeking CSG approval

Classification

<http://www.smh.com.au/environment/water-issues/secret-agl-political-donations-while-seeking-csg-approval-20140810-101yrj.html>

Hi Kerry, in light of Michael Ulph's claim to be facilitator for AGL in Gloucester and the immorality and possible illegality of the planning process there our Community Reference Group is under threat. I have already written to Michael asking for information but have received no reply. The fiasco at Weston and the Spent Pot Lining and toxic waste ponds and lack of replies to my questions is disquieting. I am in New Zealand for the next few days but will call you as soon as I return. Please advise Richard of my concerns.

Regards, Col Maybury.

Sent from my iPad

Col Maybury.
02 4937 4664 0427 889 653

CRG Photograph Descriptions.

A. Weston illegal dumping of Smelter Waste and Spent Pot Linings

1. Dump Site cnr. Kline /First St and Cessnock Road. Dump site Clark St end?
2. Smelter Waste includes Pot Anode and Carbon Blocks. Date 26.08.2012.
3. Pot Anode
4. Smelter Waste
5. Toxic Dust on Sunshade July 2014
6. Site Infestation of Farmers' Friends 2013.
7. 30% or 400 tonnes of Smelter Waste left on site by smelter for two years
8. Remediation Action Plan (Not followed.)
9. Toxic Waste Description. No resident advice nor warnings. Covered gauges.
10. Toxic Waste Handling. Main works carried out in high wind times.

B. Smelter Site and Buffer Zone Photographs

1. Polluted Wentworth Swamps cause of Red Vegetation Change?
2. Smelter Overview
3. Mount Alcan and Sheds, 300,000 tonnes of SPL
4. SPL uncovered Stock Piles left for years to wind rain and even grass cover
5. Vented Mount Alcan (Weston Waste not vented)
6. Uncovered Pile of SPL leaching onto the ground
7. Leachate Ponds holding many hundreds of thousands of tonnes . Note Bund Walls
8. ARRB use Recycled Potlining from Smelters?
9. Aerial View of Mount Alcan. Note fresh SPL on Slab. Photo five years old?
10. Distance Line from uncovered SPL Piles to Tafe Vineyards, passing over Little Boy's demolished House, 1.4 kms.
11. Joel Fitzgibbon MP Facebook: complaints about SPL Treatment in Norway by Norsk Hydro.

For further information: C. Maybury Kurri Kurri Landcare 0427 889 653.





Executive Summary

DLA Associates was engaged by HDB Town Planning and Design Pty Ltd on behalf of G J Shields Pty Ltd to prepare a remedial action plan (RAP) for the property bounded by Kline Street, Cessnock Road and First Street Weston NSW formerly identified as Lots 1 – DP 979187. Refer to Figure 1 – Site Location.

A number of Environmental Studies have been undertaken on the Site culminating in a Remedial Action Plan (RAP) being prepared by GHD Pty Ltd in 2003. The Remedial Action Plan included a soil and groundwater investigation to delineate contamination and was prepared with reference to aerial photography, previous investigations of the Site (Woodward Clyde 1998 and Coffey Geosciences Pty Ltd). The Remedial Action Plan also included a Remedial Action Plan (RAP) which was undertaken to reduce site specific remediation criteria for chemicals of concern and address the detailed outcomes of previous assessments. This RAP has been prepared to address the recommendations of the assessment.

A key objective of the RAP is to detail procedures needed in order to address the issues associated with the site (both soil and groundwater) in accordance with regulatory requirements, to a standard suitable for residential land use.

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REMEDIAL

ACTION

PLAN

Corner Kline Street

and Cessnock Road

111 Cessnock Road

Weston

NSW 2326

Lots 1 – 6 DP979187

Version 3.0

Prepared for

HDB Planning and Design

44 Church Street

Maitland

NSW 2320

Prepared by

DLA Environmental

DLH1002

September 2011

NOTE: This was prior to when the content was created.

MEDIAL AREA IDENTIFICATION

| Location on site | Identified contamination | Remedial area terminology |
|--|---|---------------------------|
| Kline Street Boundary TP01, TP05, TP09, TP07, TP10, TP12 | PdH, Bap, Total Fluoride, Asbestos, TPH | Area 1 |
| First Street Boundary Western Area TP13, TP15, TP21 | PdH, Bap, Total Fluoride, TP21 | Area 2 |

VER IMPORTANT THE RISK ALREADY EXISTED

estigations to date have demonstrated that contamination found in the soil at the site poses a risk to human health with the site in its current condition. There is the potential for migration of contaminants within groundwater may pose a risk to the environment through migration to Swamp Creek. As such remediation of the soil is required in order to remove the source of contamination. Once removal of the contaminated soil has been undertaken it is likely that the impact to groundwater will be reduced and therefore there will likely be less risk of migration.



The preferred remediation strategy for the impacted soil involves excavation and off-site disposal. Off-site treatment, though feasible, will cost more, result in the excavated material needing to be disposed of to a licensed treatment facility.

The preferred strategy to manage risk from groundwater is a natural monitored attenuation program.

The RAP outlines anticipated costs, appropriate site criteria as a reference for assessing the level of site clean-up achieved, site validation procedures and the remedial work specification. The specification includes information on the staging of works and site management requirements relating to noise, odour, dust and erosion management. Waste transportation and occupational health and safety requirements have also been outlined.

Validation of the site following remediation will initially focus on the excavated remediated areas. The remainder of the site will be dealt with under a Final Validation Report, thus the focus for validation will be on documenting:

- the extent of contamination (if any) remaining in walls and floors at excavations at completion of the works;
- that treatment of excavated material has rendered it either suitable for on-site reuse or off-site disposal;
- requirements for ongoing site monitoring (if any); and
- risk of remaining material impacting on future site users (if any).

Based on the investigations to date it is the opinion of David Lane Associates, that the risks on-site can be reduced by soil remediation. The preferred method is off-site removal and re-use where appropriate, depending on material suitability and also taking into consideration geotechnical requirements. This will reduce risk to future site occupants.

As such the recommended scope of clean-up is:

What about existing contamination?

- excavation and treatment of approximately 900 m³ of Part TPH and Fluoride impacted fill material and natural soil;
- validation samples of the walls and floors of the excavations as a record of cleanliness of the remaining material (even if more material is to be removed during bulk earthworks);
- management of risk from groundwater through monitored attenuation;
- reinstatement of the site (if necessary) to the appropriate levels using either the remediated and validated soil, imported virgin excavated natural material (VENM) or excavated natural material (ENM) and the ground resurfaced based on the Principals requirements;
- preparation of a validation report documenting works undertaken, and
- providing recommendations for ongoing management/maintenance if required.

On behalf of
DLA Environmental

Project Manager
Jay Coburn
Environmental Consultant

Project Director
David Lane
Director

I.B.



Wangara fluoride degraded
Ventworth Swamps degraded.



Toxic Leachate

Leachate collection and pumps
SPL Storage

Mt Alcan

300,000 tonnes inc.
cyanide and fluoride

Pipelines 3,217,750 metres long.



Regain idle treat plant?

Purpose Built SPL sheds.

Treat stockpile grassed?
Leaching windblown?

Mount Alcan Vented and leaching





recycled pavement structures) comprising unbound granular materials with little or no virgin aggregate, are of the most common type of Australia's 300,000 km of sealed road network. Almost \$6 billion is spent annually on enhancement and preservation works.

Traditionally, only high quality unbound materials (such as local gravels or crushed rock manufactured in local quarries) that meet State Road Authority prescriptive specifications are permitted to be used in road construction. However, the use of marginal and modified materials, including materials manufactured from recycled or waste material, which might be considered as marginal under traditional specifications, is becoming more common.

We offer objective expertise in the use and construction of unbound materials, material testing, the valuation of existing pavement condition and the development of maintenance strategies.

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Stabilised & recycled materials



RRB provides services in:

- property testing and assessment
- field trials
- life-cycle performance analysis
- cost and benefit analysis
- design processes and assessment techniques.

Recycled products in roads:

- recycled truck tyres
- in situ stabilisation with cement, bitumen and other binders
- recycled asphalt pavement (RAP) as an unbound material for new asphalt
- crumbed rubber and rubber aggregates in bituminous binders.

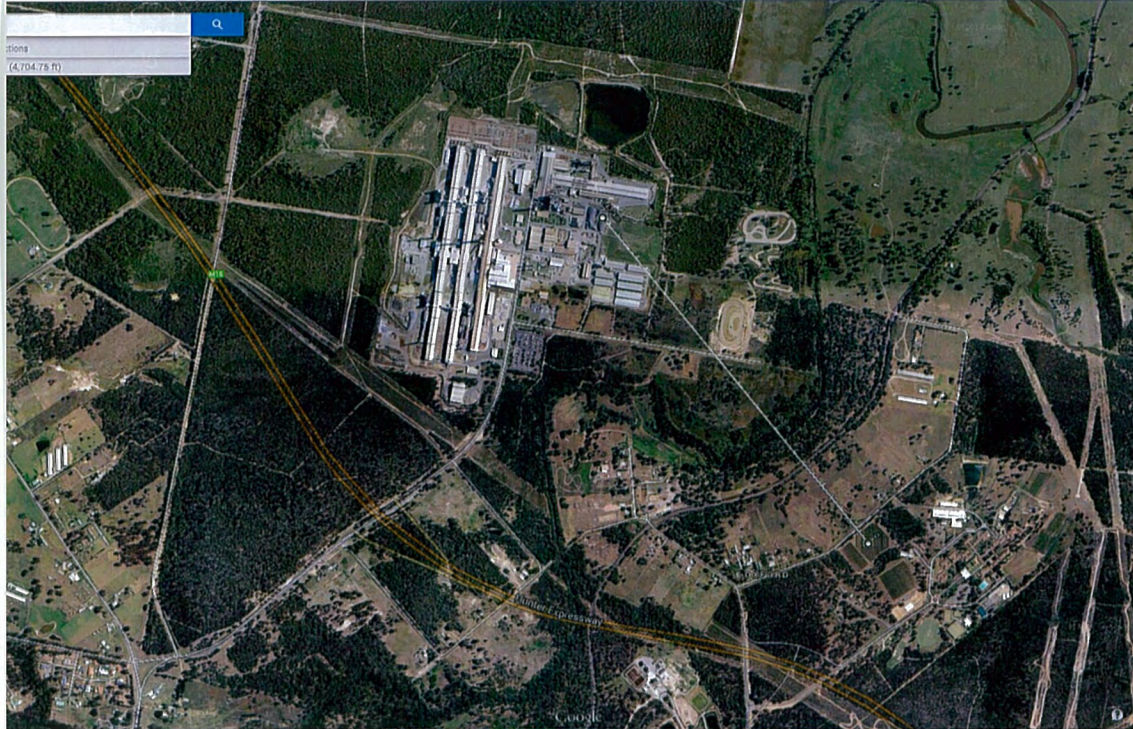
The Austroads Guide to Pavement Rehabilitation, and our Sealed Local Roads Manual provide information about recycled materials and design processes and techniques adopted by road authorities.

Recycled materials in concrete:

- recycled pot lining from smelters
- recycled glass
- recycled concrete aggregate (RCA)

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BOOK Sign Up

Keep me logged in

Joel Fitzgibbon
July 1 · Edited ·

Here is Norsk Hydro patting themselves on the back via media release about how they are recycling "toxic" SPL in Europe but talking landfill here



From waste to resource

Hydro has signed a contract to supply spent pot linings from the production of primary aluminium to Rockwool International, a producer of fire safe insulation. The agreement ensures that pot linings will be reused to benefit both the...

HYDRO.COM

Like · Comment · Share

Donna Purcell, Myra Gay Bateman, John Peter Falconer and 32 others like this.

1 share

Annette Rees Is there a sensible way to recycle ours....if so we should be doing it...no questions.
July 1 at 7:56pm

Richard Hogan I worked with that same sort of waste as a contractor at the tomago smelter 20 odd years ago. Some if it was dumped at the old brick works quarry at Metford with the worst of it stored in massive sheds on site because they didn't know what to do with it... See More
July 1 at 9:09pm · 3

Paul Jennings dont let public health get in the way of making money
July 1 at 9:18pm

Annemarie Sorenson I think all politicians need to go into a melting pot.
July 1 at 11:49pm

Shane Skeen Kurri smelter should not have shut down, I myself have been affected by the outcome of the closure, yeah there is a hill of waste product on site in the smelter yard, just any industry will always have waste, I think the government should have done mo... See More
July 2 at 5:35am

Kay Etchells Typical make your money dump your workers and leave the vile rubbish for others to worry about.
July 2 at 4:31pm

English (US) · P
More ·
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