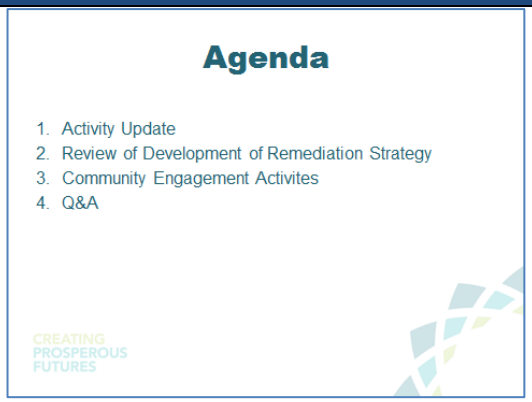
NB: Note that minutes are paraphrased to an extent and may not exactly match actual statements.

Project	Hydro Kurri Kurri site redevelopment project	From	Janita Klein
Subject	Community Reference Group	Tel	1800 066 243
Venue/Date/Time	Thursday 18 June 2015 Hydro offices, Kurri Kurri 6.00pm – 8:00pm	Job No	21/23175
Copies to	All committee members		
Attendees	Mr Rod Doherty – President Kurri Kurri Business Chamber Mrs Kerry Hallett – Hunter BEC Mr Colin Maybury – Kurri Kurri Landcare Group Mr Brad Wood – Community representative Mr Toby Thomas – Community representative Mr Andrew Walker – Hydro Kurri Kurri Mr Alan Gray – Community representative Mr Richard Brown – Managing Director, Hydro Kurri Kurri Mr Ian Turnbull – Manager Natural Environment Planning, Cessnock City Council Mr Ian Shillington – Manager Urban Growth, Maitland City Council Ms Fiona Robinson – Environ Mr Michael Ulph – CRG Chair, GHD Ms Janita Klein – CRG minutes, GHD		
Apologies	Clr Arch Humphery – Maitland City Council Mr Kerry McNaughton – Environmental Officer, Hydro Kurri Kurri		
Not present	Mr Bill Metcalfe – Community representative Clr Morgan Campbell – Cessnock City Council		

Notes	Action
Michael Ulph (Chair) *Welcome and Acknowledgement of Country* Meeting commenced at 6.03 pm	

Notes	Action
2. Meeting agenda • Welcome and meeting opening • Apologies • Adoption of minutes from the last meeting • Project update • Community engagement activities • Expanded discussion about the development of the proposed remediation strategy • CRG questions and answers • General business • Next meeting / Meeting close	
3. Welcome and meeting opening Michael Ulph welcomes the committee and confirms that Rod Doherty, Kerry Hallett and Toby Thomas will be a little late as they are at another meeting. I haven't heard from Bill Metcalfe. Welcome Fiona from Environ who will be taking part in the meeting as it progresses.	
Last meetings minutes **Michael Ulph:** Colin has emailed me about a point in the last minutes. Basically there's a section in here that talks to something that Colin said, talking about the dollar figure for the processing of spent potlining by Regain that was quoted to Colin at Regain **Colin Maybury:** Regain quoted to us down at Tomago they were getting [dollar amount] per tonne. **Michael Ulph:** Okay. So, Richard has mentioned that to one of his colleagues. Richard if you wouldn't mind speaking to that and then close that off. I'll find the section in the minutes while you're speaking. **Richard Brown:** As you all know Hydro has a small percentage ownership of Tomago Aluminium, 12 per cent. That ownership is managed by a company that is a fully owned subsidiary of Hydro. We have a board for that company, and one of my staff members is actually on the board for that share of the ownership of Tomago. So when it was mentioned that there was a dollar figure put on the cost, he's actually discussed that with the management of Tomago and their response back is that that number is incorrect and they would not like that mentioned in the minutes as it is commercial in confidence.	

Notes	Action
If there are concerns around that, Col, it's with Tomago. **Colin Maybury:** No it's not, it's with Regain. **Richard Brown:** No, the issue is with Tomago. **Colin Maybury:** Tomago and Regain are the ones who we met with when we went down to inspect. **Richard Brown:** That's what I'm saying though, the agreement Regain has is with Tomago. **Michael Ulph:** From my point of view, in terms of… **Colin Maybury:** It's not incorrect. What I'm saying is that that is what they told us down there. And I have an email that clarifies that from the Vice President of Landcare who went with me. **Richard Brown:** What you heard was not the right number. You were told something incorrect. **Colin Maybury:** Lies. Or if that is the case or your person lied, and I don't accept that this is commercial in confidence. **Richard Brown:** That's the issue that Tomago have got. **Michael Ulph:** The issue I've got is that Tomago management have said that number is not correct, and to put something that we know is not correct into the minutes is misleading to people who read it. We around the room know that there's discussion and argy-bargy or disagreement on that figure. We know that here. But if someone is to read the minutes off the website anywhere on the planet, because it's available, they could be misinformed about that dollar figure. We know what you've heard, spoken by somebody else, but clearly if Tomago say that number is incorrect then they're the people that pay that figure. **Colin Maybury:** Not if they're covering it up by saying it's commercial in confidence. Commercial in confidence is a cop-out in most cases. Let's cut out the 'incorrect' – you're saying that my statement is incorrect, cut that out. **Richard Brown:** We're saying that the figure is incorrect. **Michael Ulph:** I'm saying that the figure is incorrect. Tomago are the people who pay the money. **Colin Maybury:** Read that please [May 2015 minutes], it says 'XXX'. **Michael Ulph:** What page are you on, mate? **Colin Maybury:** 12. **Richard Brown:** That's right; the figure has been	

Notes	Action
redacted out. **Colin Maybury:** Okay, if there's a dispute about it. But take out that it's incorrect. I wasn't incorrect; I was telling you what he told me. **Michael Ulph:** Yes, so one person has told you something. *Rod Doherty and Toby Thomas enter the meeting. Michael welcomes them.* **Michael Ulph:** Clearly this person is a Supervisor, I think you said, at Regain and so it would appear that person is either misinformed or something. Tomago management would know what the number is, wouldn't they? **Colin Maybury:** Take out the fact that Tomago Aluminium has requested that the "figure may not be published as it is incorrect". Take that out, you've got three X's in there. **Michael Ulph:** Just take the figure out all together? **Colin Maybury:** You're not publishing the figures. **Michael Ulph:** Yes, I know. But what I want to do is keep the fact that you said something in there. I don't want to take out everything you said. But I want to take out the figure. **Richard Brown:** I think I understand what Col is saying, just take out what Tomago said. Leave the X's there. **Michael Ulph:** Oh, okay you want me to take out the bit that says the note. This explains why it says 'XXX'. **Colin Maybury:** Thank you all you like, but take out that it is incorrect. It is not incorrect. **Michael Ulph:** To my mind it is more important that we get the note, if the number in there it's right or not right, that it's commercial in confidence. **Colin Maybury:** Put it in to say these figures are commercial in confidence. End of story. **Michael Ulph:** Okay, I'm thinking about the reader at the end of the day, the public who will read this. Let me think that through. If I say that they are commercial in confidence and not that they're incorrect then the number hasn't been mentioned anyway. Okay, I can do that. **Rod Doherty:** When do they go on the web? **Michael Ulph:** As soon as we approve them. Okay, so everyone else has seen the minutes. *Kerry Hallett enters the meeting. Michael welcomes*	

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Kerry. **Michael Ulph:** Alright, moving right along. Could I please have someone move that they are a true and correct record of the minutes? *Minutes moved as a true and correct record by Alan Gray and seconded by Kerry Hallett.* **Michael Ulph:** thank you Alan and Kerry. And welcome to Rod and Kerry and Toby. Has anyone heard from Clr Morgan Campbell or Bill Metcalfe? *No response.* **Michael Ulph:** Alright, we'll move on.	

Activity update

Michael Ulph: The next item on the agenda is the project update. I'll hand over to Richard to talk to that.

Richard Brown: And I'll hand this over to Andrew.

Andrew Walker: This is an update on the early works that we're currently doing. The main activities are asbestos removal, bulk oil removal (due to start next month), filter bag removals (due to start next month), super structure and busbar removal, and baked furnace de-lining.

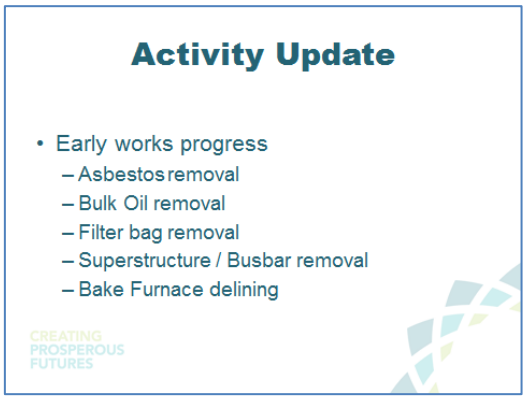
Asbestos removal: With the asbestos removal, last meeting we showed you the saw cutting in line one. We found that there is asbestos not only underneath these lids but when we checked the original drawings we found that there's asbestos either side of the fume duct trench, which used to take all the pot fumes away to the scrubbing system. We've saw-cut over three kilometres of concrete, and we're pulling out the cement and asbestos gasket as well.

Line two is finished, and we're back in line one with additional work. Line three will be the last which has a little bit of asbestos.

Bulk oil removal: We've been out to tender with some local firms. We've got quite a large volume of oil, and we've got the HTM system in the green mix plant at 19,000 litres. The larger hydraulic systems across site, 21,000 litres of oil. This work is starting next month.

Filter bags removal: The filter bags in the carbon plant scrubbers and also in the bath processing plants, in pot treatment and carbon, are the main areas of work and will also be starting this month.

Toby Thomas: I assume that the bulk oil is



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recyclable? The filter bags.

Andrew Walker: Yes. It's filtered and some of it, the hydraulic oil can be reused. The HTM oil will probably be used as a fuel, I think a lot of it goes to the power stations.

Toby Thomas: Filter bags?

Andrew Walker: Filter bags can't be recycled, so we're currently storing them onsite in the sheds that we've got until the cell is available.

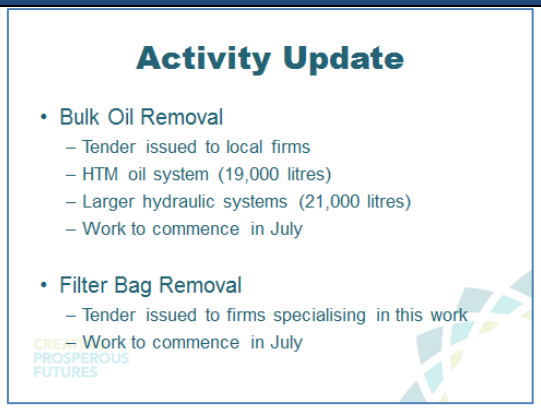
Super structure and busbar removal: This is work that will be happening in the pot rooms. This is removing the super structures where the anode rods were clamped and the risers which connect the cathode busbar to the anode busbar. We've invited a number of local mechanical contractors in the area to tender. There's been a lot of site visits, it's a complicated job and that's going to generate about 4,000 tonnes of ferrous scrap, and up to 10,000 tonnes of busbar depending on how far we go with the scope – we've got to way up the economics of just doing the anode busbar versus both anode and cathode busbar.

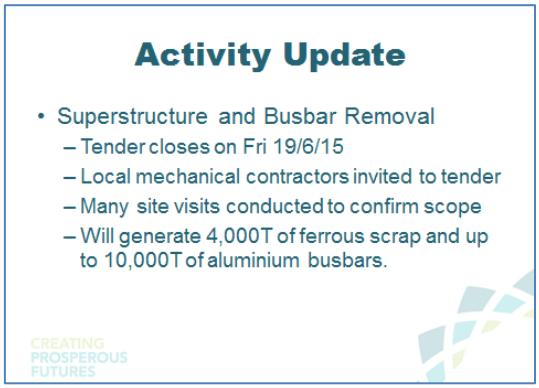
Baked furnace: This is the other area we're working on. The activities there are removing the packing coke, 2,500 tonnes to be removed; removing the SMF or synthetic mineral fibre; and de-lining the crossover. Our intention is to use the bake furnace as a temporary storage area for the spent pot lining, as we've got no room left in the ten sheds.

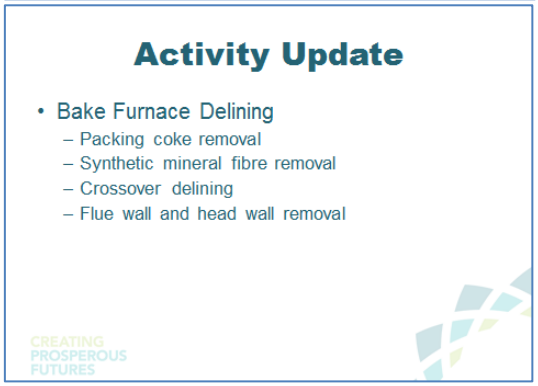
Richard is now going to show some time lapse here.

We're using this refractory maintenance platform, and the guys actually go down in the cage to remove the synthetic mineral fibre. Here they are removing the slab, the head wall slabs, and then they're removing the flue wall slabs. All the surrounding fibre has to go into a plastic bag inside a bulker bag so it's double wrapped and then stored in the shed. Each section generates about two bulker bags worth of SMF, and there are 52 sections in total and over 100 bulker bags of surrounding fibre. That's all got to be taken out before we start removing refractory; we don't want to contaminate the refractory.

And the next one shows the demolition of the flue walls and the head walls using the muncher. It's called a flue wall muncher. It's a grab that actually grabs pieces of the fluoride off and drops the bricks into bins we have in the pits and lift them out. At the moment we're just dropping the bricks in the first two sections and we're going to make a platform for a small 10 tonne excavator to be lifted in to demolish to







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rest of the furnace.

That's the muncher working.

The cranes haven't been used for two years so we had to get them all serviced. We don't have resources on site anymore, so we had to use an external company to do that. That's all had to be done in preparation for this work.

The next few slides show a few photographs. Here is the rig we're using to get the packing coke out: it's just a suction pipe dumping to a vacuum truck outside the building.

These photos show the before and after of the SMF removal and refractory removal.

This is a crossover, which we haven't actually started yet. We've got the scaffolding in place and we'll lift the end off.

That's a view inside the crossover.

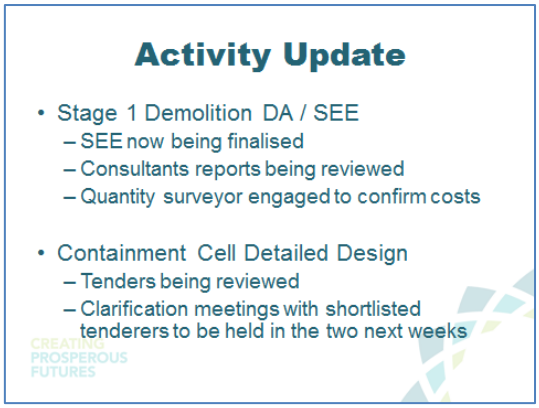
Michael Ulph: And what's the crossover?

Andrew Walker: It connects the eight flue walls on one side to the eight flue walls on the other side of the furnace. The furnace is called a ring furnace, so the fire actually moves around the furnace in a circular pattern. It takes two months for one fire group to move around the furnace. We're surprised at how clean it is inside there. The old furnace that we had, had a lot of soot build up in the cross over, but this was very clean which showed the combustion was very good in the new furnace that we built back in 2004. Even though it was starting to age it was still burning quite well.

Approvals: The other work we're doing is getting ready for the approvals for the demolition, what we're calling Stage 1 demolition which is all buildings on site except any buildings storing spent pot lining, or concrete structures that require explosives. These would be done as part of stage 2, which is the main State Significant Development.

The SEE, Statement of Environmental Effects, is now being finalised. Consultant reports for air, noise and traffic impacts have been compiled and we are now reviewing these. We've also engaged a quantity surveyor to confirm the costs of demolition because that has to go in to calculate the fees for the DA.

We're also working on the containment cell detailed design package. Tenders have come in and we're currently reviewing those technically and commercially. We're involving Environ in the technical review, and we'll be having clarification



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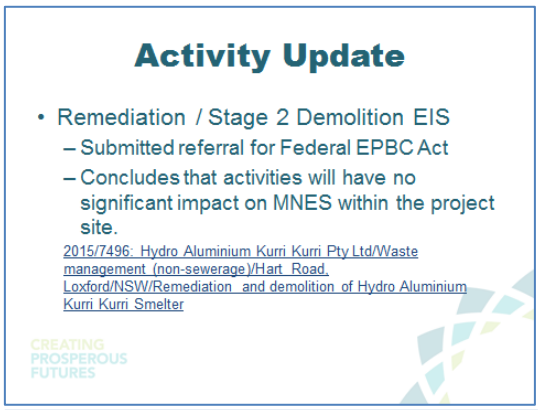
meetings in the next few weeks.

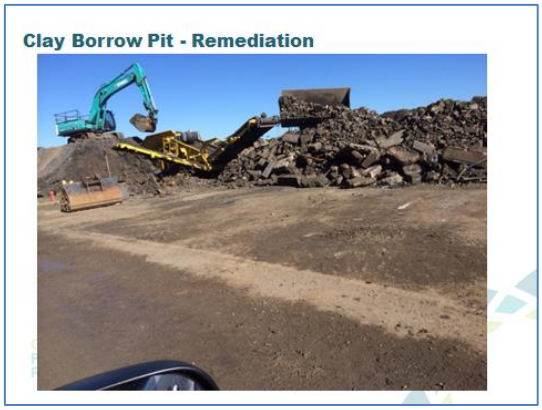
Remediation Stage 2 Demolition, Environmental Impact Statement: I'll hand this to Richard.

Richard Brown: I can talk about the EIS. One of the things we have to do is an assessment of the project impact on potential matters of Matters of National Environmental Significance, which is MNES. They are declared under the *Federal Environment Protection Biodiversity Conservation Act*. We've had some consultants do an assessment of the activities that have been planned around the project and the project site. The conclusion is that the project won't have any significant impact on matters of national environmental significance. That referral has to go to the Federal department for assessment, which it has at the moment. You can look at that on-line, I can't look at it here as we don't have internet access. But you can look at that application online and it talks about the assessment that's been done.



Michael Ulph: So in the minutes we might actually pull that link out of the slide and put that in this section of the minutes so anyone can click on it if they want.

2015/7496: Hydro Aluminium Kurri Kurri Pty Ltd/Waste management (non-sewerage)/Hart Road, Loxford/NSW/Remediation and demolition of Hydro Aluminium Kurri Kurri Smelter



Richard Brown: Yes, and we'll put that link on the website as well.

Michael Ulph: Yes.

Richard Brown: Work on the clay borrow pit is continuing. Here are some photos taken this morning. Ongoing works grading the coarser materials which are refractories and concrete from the soil and clay matrix, as you can see.

That's a photo now up at the clay borrow pit. I think the estimate is that we've got 90 – 95 per cent of the fill from that site now removed. There's a little bit of material remaining.

This is a bit of an example of some of the fill we're seeing. It's not necessarily filled with refractory bricks or anything like that, we're actually seeing fill that looks like it's been potentially imported from another area because it's quite clean fill. But we're still removing that back to natural so that the site can be validated as clean.

Other activities along the planning proposals: The rezoning proposal for the Cessnock LGA, we will be lodging tomorrow, so that's pretty amazing. That's

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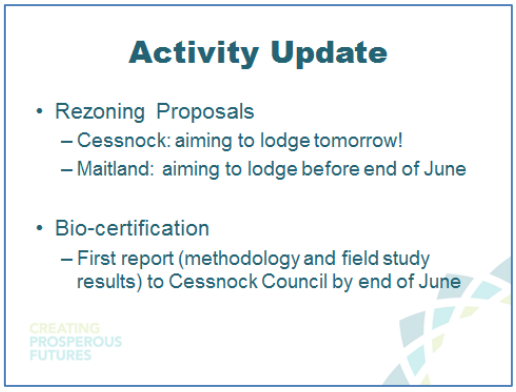
about two years' worth of work too now start its journey in Council tomorrow. And Maitland LGA, we've got all the reports being finalised so we'll have that hopefully by the end of next week, Ian, but if not that will be by the end of the month. *Biocertification*: Regarding biocertifiation, the first report which is outlining the methodology and field study results, we're going through that now and will then submit that to council for their review. We will then jointly present that to OEH, the expectation is that we'll have that to Council by the end of the month as well.	 
Community engagement activities **Michael Ulph:** Over to me. A little bit of information about the community engagement activities. *Facebook advertising* I think we mentioned last month we were planning to do a little bit of advertising on Facebook. We did this to attract people along to the community drop-in information sessions we held. We held three of them over the last month. This is a Google maps picture of the area. If you look at the inner circles there, basically what I've done to target the local community is to place ads on Facebook and set it up to target anyone who is living in Weston, Kurri Kurri, Heddon Greta or Abermain. You can see that area on the map. Gillieston Heights doesn't come up as a discreet town with enough people so that you can select it on Facebook. So we ran these four smaller circles for most the time, though in the lead up to the Gillieston drop-in session I widened the reach. I could choose one of the areas, say Kurri plus 10 miles, so it's in American language. So, the outer circle is my approximation of about 10 miles, about 16 kilometres around Kurri Kurri. You can see it takes in a heap of Cessnock to the	

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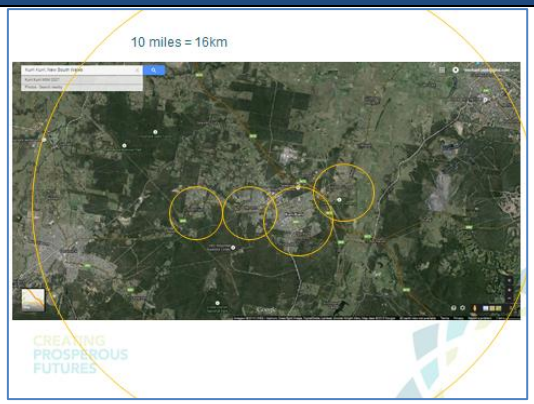
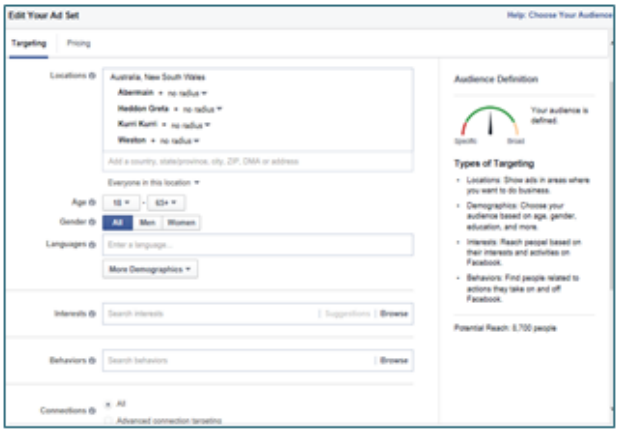
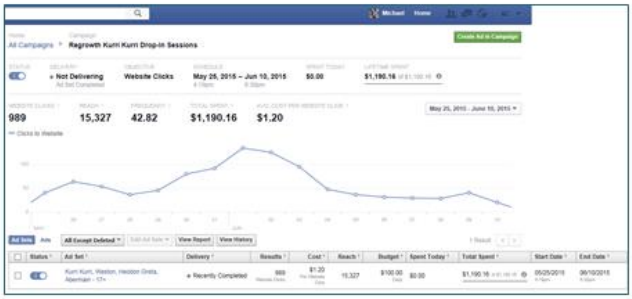
bottom left and also Maitland to the top right. And that's why it didn't go this wide all the way through, because the discreet audience moves from something like 18,000 to around 200-300,000 people that you're targeting through Facebook, and every time someone clicks on that it costs you about a dollar. So, when we were meeting in Weston and Kurri, so the first and third instances, I wanted to make sure we spent the money wisely. But to get out to Gillieston Heights I had to widen it out for a little while.



In the next slide, you can see in the screen shots from Facebook, up the top it says Abermain with no radius, Heddon Greta no radius, Kurri Kurri no radius, Weston no radius. And the age group was 18-65 years' + and the potential reach here is 8,700 people which is a fairly discrete audience.



If you go to the next one, this is the actual results of clicks to Facebook over that time from late May till 11 June, the end. The bump in the middle is when we widened it out to include that bigger area and we were getting on some days 150 clicks to the website.



The main facts I wanted to show you here were these: you can see there were 989 clicks, which is the total number of people who saw the ad and actually clicked on it. They were then immediately

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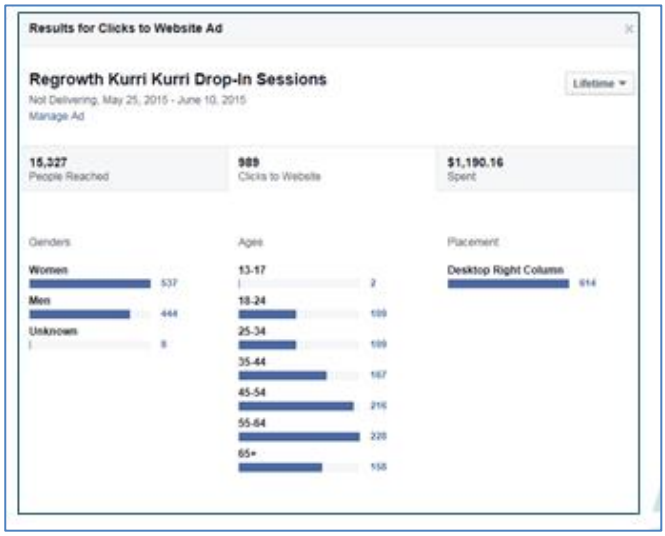
directed through to the page of the Hydro website that had the details about the drop-in sessions. It was delivered to some 15,327 individuals (people who saw the ad), that is individuals not including multiple views by the same person. Of those who saw the ad 989 clicked on it, so about 1 in 16 people clicked on it. And it cost about $1.20/ click so we spent about $1200 of Hydro's money.



This shows a break up of that: again 15,000 odd people reached, 989 clicks and amount spent.

The gender: there were more women than men, so 537 women and 444 men and 8 unknown. So they hadn't put in what sex they are.

Rod Doherty: They weren't gender specific.

Michael Ulph: They weren't gender specific in their Facebook profile.

We limited it to 17 years' and above. We had two clicks from people in the 13-17 year age bracket, so we know these people put their age in as 17 years. You can see the demographic breakup here; the highest demographic representation was the 55-64 age group with 224 people clicking through. And there's a bit of a spread through the ages, but generally 45-65 years' showed the highest level of interest in the project.

We had four different images for the advertising. One with the Hydro logo, one with Regrowth Kurri Kurri logo, one that was a photograph of the Hydro site, and another that was an aerial of the Hydro smelter site. We got different responses based on the different graphics, and the Regrowth Kurri Kurri got the lowest with about 100 clicks and image two, the Kurri smelter picture got 399 clicks. So, we can

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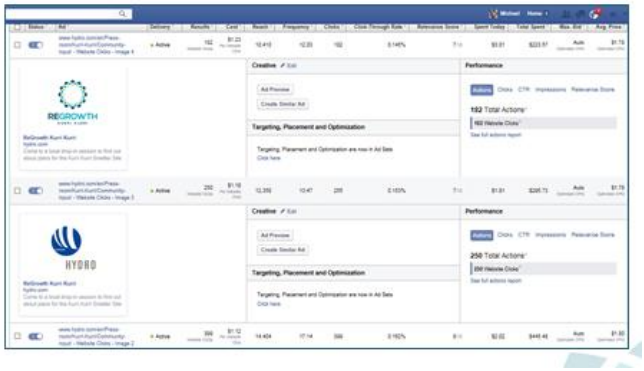
actually adjust the advertising by withdrawing one of the ads if you wanted to use the ones that are shown to be more effective.

This is an example of two of those ads. Basically the text said ‘Regrowth Kurri Kurri’ and then had the website hydro.com but the link to you directly to the specific page. You’re only given a small amount of space, so in the copy underneath we had this: ‘Come to a local drop-in session to find out about plans for the Kurri Kurri smelter site’.



Newspaper advertising

Rod we took your advice that the ad faded out in the paper and so we asked the papers to do something about it. Previously in these ads we’ve had a graduation from left to right where it fades to quite light. This is now a solid colour. I don’t know if anyone saw it and can comment on whether it looked any better? No one saw it?

Colin Maybury: Yeah I saw it.

Alan Gray: I saw it and thought of Rod’s comments.

Michael Ulph: You could read it. Okay, this is where we placed them in the Advertiser on 27 May, 3 June and 10 June. Lower Hunter Star on 28 May and Mercury on 28 May and 5 June.

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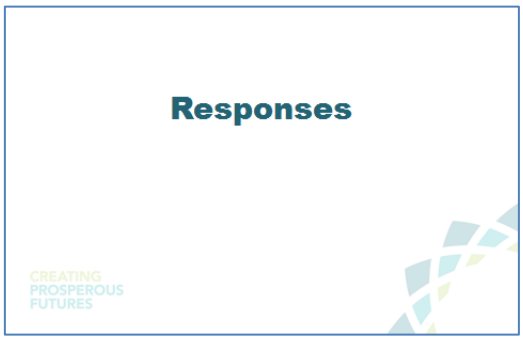
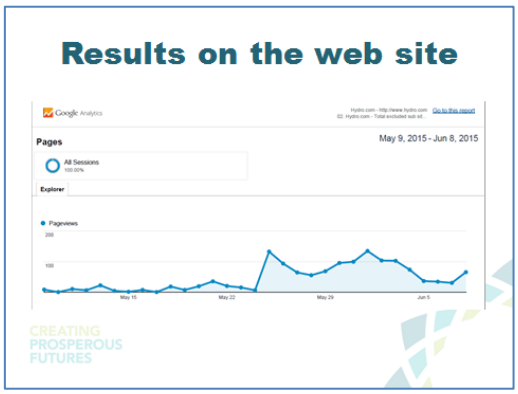
And the response to all that. We know that we had clicks on the website, and you can see a spike from when we actually started and it went up to 130 odd clicks in one day and then again when we widened the net. The total number was 1,392 page views in total so that's the page they landed on but also had a look at the other pages. I can see from this the top one had Community Input written on it and that tells me 699 people went through there. And then again from a US ISP there's a smaller number there with 36 people accessing the site through there, and so on.

We can see the other pages that they looked out, there are Activity plans, News and Newsletters about the project and so on. So we had a total of 1,392 page views from a unique number of computers and 1,203 people from different computers accessed the site. The average time spent on the page is 1.43 minutes, so they've had a reasonable look at it. And that's probably most of the relevant information about that.



Video

We also put the video on Youtube. As of yesterday we've had 155 views of the video so 155 people have looked at it. And we're also handing them out in the show bags and on display at the info sessions as well.



Results for the drop-in sessions

So the results in as far as promoting the drop-in sessions didn't reflect the number of people who looked and knew it was on. We had quite a lot of people, 700 at least, that saw on the website that it

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was on plus whoever saw it in the paper.

The three drop-in sessions had numbers as follows:

- Community attendees at Weston was seven
- Gillieston Heights was nine
- Kurri Kurri was twenty four.

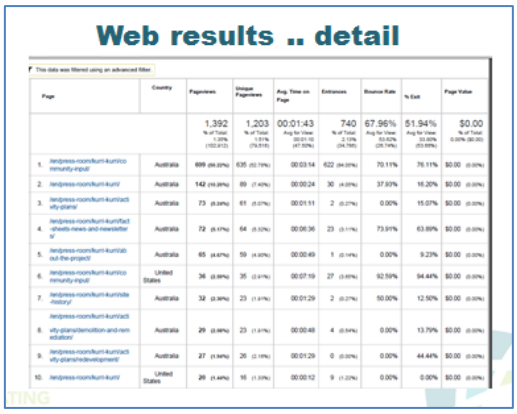
Kurri Kurri was the last one and probably had the cumulative effect of people seeing more ads. People being reminded of it happening more often. And we also had a mention in the Mercury as well before the last drop-in session. I would like to thank those of you who came along. And I note your numbers are incorporated into those numbers as well. On a couple of occasions there were two or three CRG members who were included in those numbers.

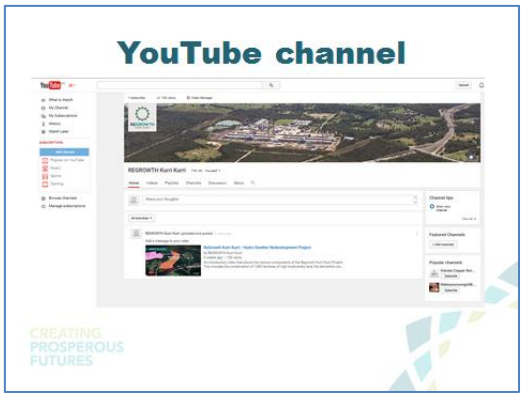
We did a break up and found this:

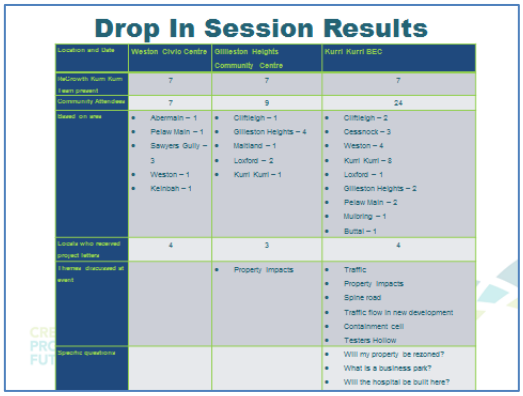
- At Weston - We had one person from Weston, one from Keinbar, three from Sawyers Gully, one from Pelaw Main, one from Abermain. Of that seven, four had received the letters. We sent letters to our database as relevant.
- Gillieston Heights (second session) we had three who had received letters. We had four from Gillieston Heights, one from Cliftleigh, one from Maitland, two from Loxford and one from Kurri Kurri.
- At the final session we had eight from Kurri Kurri, four from Weston, three from Cessnock, two from Cliftleigh, one from Loxford, two from Gillieston Heights, and two from Pelaw Main, one from Mowbray and one from Buttai.

We have also given you a little bit of information there about the discussions. There was a bit of a theme through most of the visitors that weren't CRG members. Often people were tenants of Hydro, or had adjoining properties, so they had their own private residences adjoining as neighbours or lived close by and they were interested as to how the residential rezoning might impact them. For example, how the commercial rezoning came close to their property and that sort of thing were key to those people.

We did have somebody mention traffic, a couple of people talked about the spine road around the Gillieston Heights area. We have that area that was looking to be rezoned for residential and it is above that flood area, Testers Hollow flood area was







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mentioned a couple of times. Traffic flow in the new development, so if it was a new spine road to Gillieston Heights and if Testers Hollow was flooded, what would the traffic flow be like, and so on. Also about the containment cell and Testers Hollow. Also specific questions like 'Will my property be rezoned?' 'What is a business park?' 'Will the hospital be built here?' We did give everybody a feedback form to either submit on the day, fill in their details, ask questions, or take away with you. That is where we got those questions. It wasn't a roaring success in terms of having hundreds of people walk through, but I think what we can take from this is that a lot of people knew it was on, we have got the website, the statistics that show that a lot of people saw all the dates that it was on, but the level of interest wasn't high enough to get them to actually come along and/or they got on the web, or saw something on YouTube and got information that way. In my opinion, we keep doing what we are doing, we keep on having integrated strategy to communicate, and we have this forum, through the minutes on the website, through the website, through various other means. Give people various options to find out about the project. Have we got anything else there? Any questions for me on the consultation we have just undertaken? **Rod Doherty:** There was a suggestion that maybe you take the project to the people, rather than the people try to come to the project. For example, we mentioned at the business meeting tonight, retired miners, 30 odd people turn up to that normally. **Kerry Hallett:** Focus on that sort of thing. **Michael Ulph:** We are looking to hold meetings with local community groups. Some of those are in the planning stages at this point in time. I will let you know. **Rod Doherty:** I think that's a good approach. To target some of those groups. **Michael Ulph:** That is good feedback, thank you. **Alan Gray:** Something I would like to say is that I think [mentions developer] must have been listening in on our last meeting. I asked a question about the spine road [around Testers Hollow]. It was in the	

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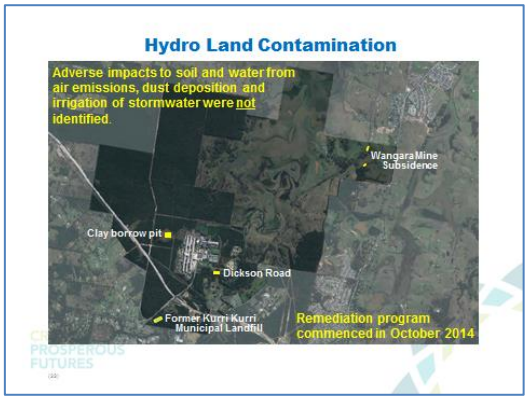
paper two days later. **Michael Ulph:** Thank you, I will hand back to Richard to take us forward.	
Review of development of remediation strategy **Richard Brown:** So the rest of the meeting I wanted to do a bit of revision if you like. Go over some material which was stimulated by the last CRG meeting and a lot of the discussion questions around that. What I intend to do is to talk through the development of the remediation strategy again. I think it is important now. When we talked about it seven or eight months ago, everything for you guys was pretty new and the concepts were different. But now you have had a chance to listen to a lot of the discussion and form some opinions, and do your own research. So I am going to go back through how our thoughts developed so you can use that with yours new found perceptions on what we've arrived at. So again, a lot of this, you have seen these slides before. I will go through it, might go through some of the stuff in a bit more detail. There are a couple of new slides here. Then we might do a bit of white boarding. As a refresher; we have done extensive assessment across the Hydro site and we've not identified any adverse impacts from the operations in terms of dust deposition, soil or water. Across the site, in terms of material that needs to be remediated, there are a quite limited area, those areas are limited to the mine subsidence areas in Wangara which have been removed and validated, the clay borrow pit which you have seen is well underway of having removal, the former land fill, municipal land fill which we haven't touched but we are developing a remedial action plan as we are for Dixon Road area, and then there are some isolated impacts from historical use of the residential/ agricultural use of the land. And of course we had the smelter site; the assessments that were done across the smelter site have identified some isolated areas that are impacted by the operation as well as the capped waste stock pile. Those impacts are mainly due to PAH impacts in soil. **Fiona Robinson:** Do you want to say what that is? PAH is an organic compound from the contents of the carbon anodes, so it is pitch and coke and coal. So it is an organic compound which is a known	  

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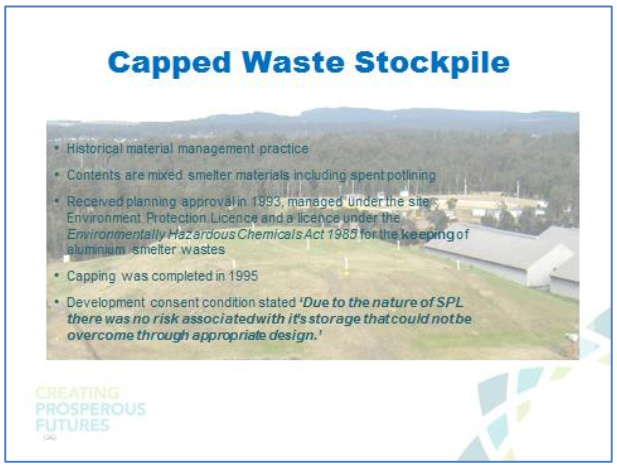
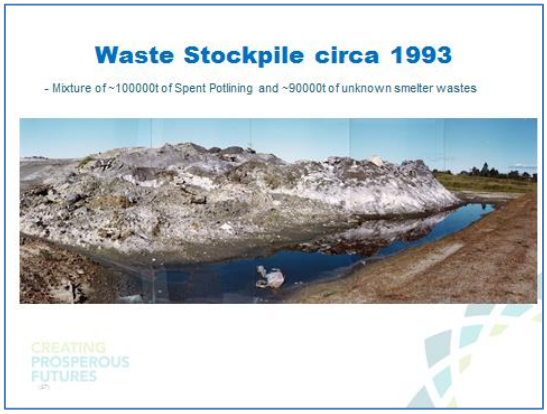
carcinogen but in this form not mobile.

Richard Brown: The other areas that we have identified as possibly requiring remediation are some drains and some dam sediments but they are very limited to the east surge pond and the drain that feeds that. Then of course we have the capped waste stock pile and the associated ground water systems beneath this. So you'll remember you have seen this, the capped waste stock pile based on historical management practice, the contents are mixed and I will show you some photos in a minute.



The smelter received approval to cap the stock pile in 1993 from Cessnock Council so that that material could be kept under the environmentally hazardous chemical act and we have a licence to do that called the *chemical control order*. That was capped in 1995 and the consent granted at the time concluded that the capping was adequate to control the risk from that material.



To highlight the fact that when we need to derive or come up with a remediation strategy, we need to understand the nature of that material and we only have, I guess, anecdotal evidence to the composition. We do know that all of the potlining that was generated between 1969 and 1993 ended up in that pile and that accounts for about 50% of the total volume. The rest of the pile comprises of other smelter materials. The likely sources of those materials are basically everything that could have been handled at the smelter. It's anodes, it's alumina, it's bath, it's bulk oils, it's synthetic mineral fibres, it's potentially asbestos and it's not segregated in any neat, nice way. We know that the location is in a terrible position, it is not lined, it's sitting on the natural ground and that the geology in the area is that there are very high groundwater tables, and the leachate was generated from that pile

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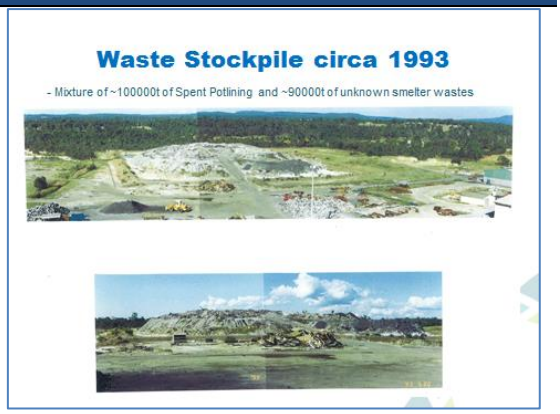
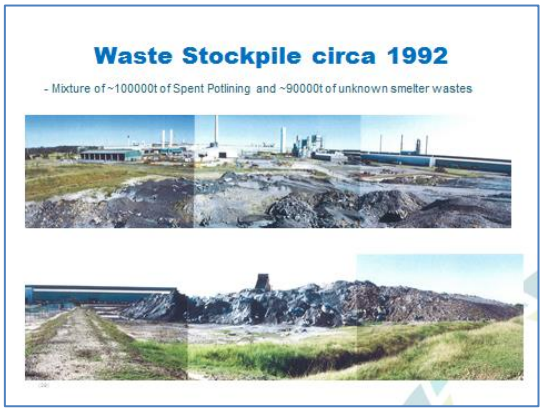
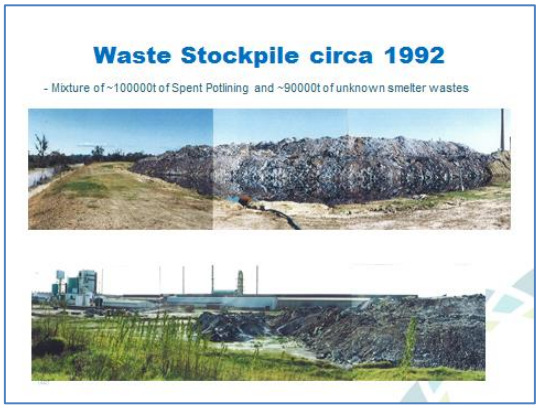
is entering the groundwater system. I have identified a number of other photos to give you an idea. The pile in and around the early 90's, just prior to when it was capped. You can kind of see from these piles the types of materials and the way in which it was placed. **Colin Maybury:** Excuse me Richard, doesn't that … go back one of the slides and have a look at that front picture, indicates there is a very large amount of salt coming out. That's spent potlining salt as far as I am aware. **Richard Brown:** That's probably material that has soluble fluorides and soluble sodium's. That includes spent potlining, it includes waste anodes, anything that has basically been in the electrolyte, perhaps even the electrolyte itself. A lot of the white material you see in and around could be alumina, it could be bath material. At this time there is a truck here placing material. This is an interesting one where you can see drums sitting on the pile. You can also see the bunded area, the liquid that's contained within that bunded area. So what we know about the capped waste stockpile, beside from anecdotal evidence and material that is coming off it, we are measuring the leachate in the ground water system and we are measuring the gas from the pile since it has been capped. We know that the capping has been effective because we are able to watch and are able to see the concentrations of leachate change after the capping of the pile. We are also able to measure the concentrations of types of gasses that typically might be given off from spent pot lining if it has been wet. So the hydrogen, methane and ammonia. Typically the concentrations we have seen range from 1100 milligrams of fluoride down to 200. Cyanide total form, that's not necessarily bioavailable. That's total cyanides in that range at 230, free cyanides from samples where it is bordering on undetectable to up to 19.	  

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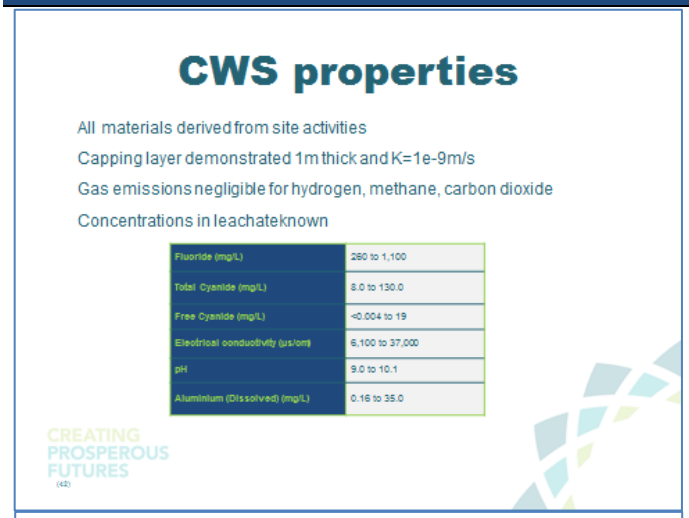

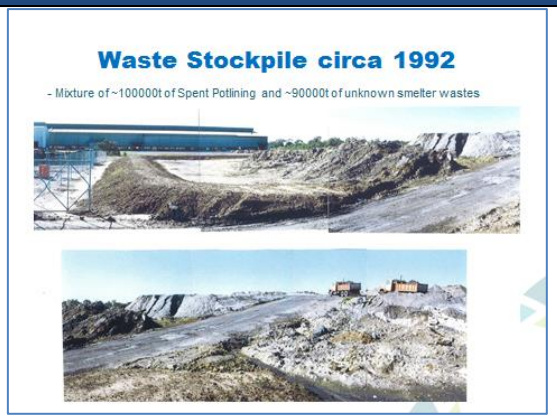

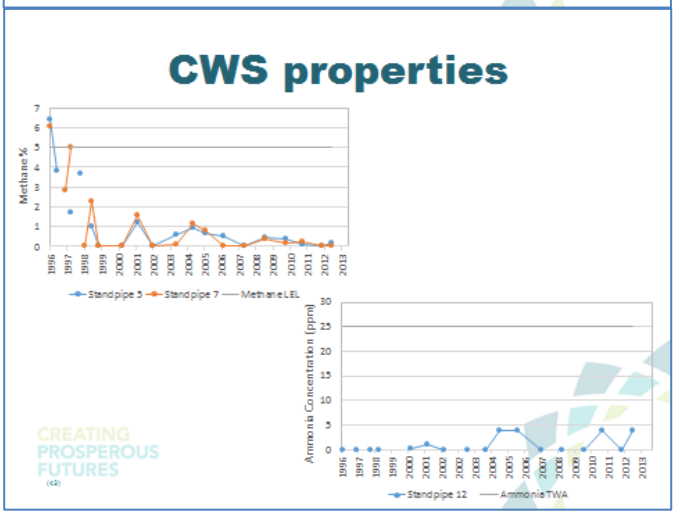

We see consistently very high electrical conductivity. So that is typically the saline, the salt. High pH And dissolved aluminium. In terms of the gases that get given off, this is data that we collected regularly over time. We have got methane concentrations here which you can see have improved if you like or have dropped away over many years. For reference the five per cent level here is the lower explosive limit for methane. Methane effectively becomes dangerous at 5% concentration. Ammonia, we detect very limited amounts, concentration less than 5 ppm. Again for reference this is the time weighted average.

That is essentially where exposure, ongoing exposure mainly becomes a problem to human health.

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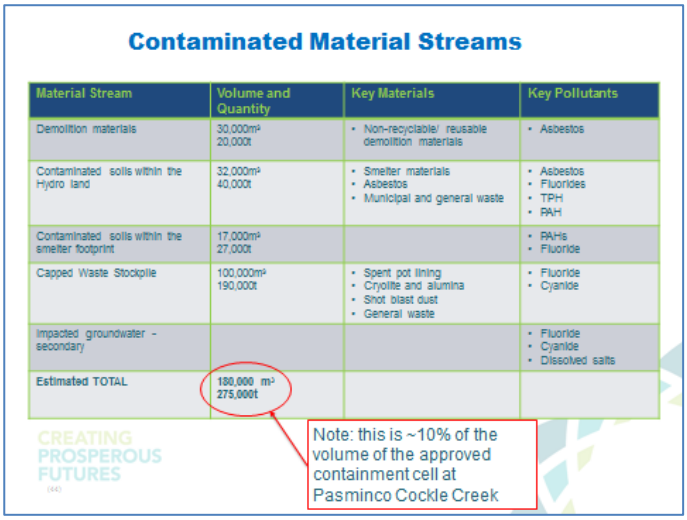

That gases given off that we are collecting, don't represent unacceptable risk. We have, just this week, installed some new gas wells into the pipe just to make sure we are not reading gas wells that are in an area that are somehow affected by the fact they have been in for 25 years. So we have just installed some gas wells and we are going to be collecting samples over the next week or so.

In total the material streams that we have identified and estimated their volumes are the demolition materials that are going to be derived from the demolition activities that are non-recyclable in the order of 30,000 cubic metres. Contaminated soils within the site are estimated to be 30,000 cubic metres again. Contaminated soils, sorry that's within the land, not within the smelter site itself, within the site itself, less than 20,000. And the capped waste stock pile at 100,000 cubic metres.

The total amount of that material adds up to 180,000 cubic metres. As a point of comparison which we talked about last time is the Pasminco site. This is 10 per cent of the approved volume of the containment cell at Cockle Creek. In comparison it is tiny compared to Cockle Creek. You will note there's something missing there.

Toby Thomas: Where's SPL sheds?

Richard Brown: The reason is because as we are developing this thought we had to deal with all this material. Our thought was, let's look at all the material that requires remediation and develop a strategy for that. Let's leave spent pot lining on the side.

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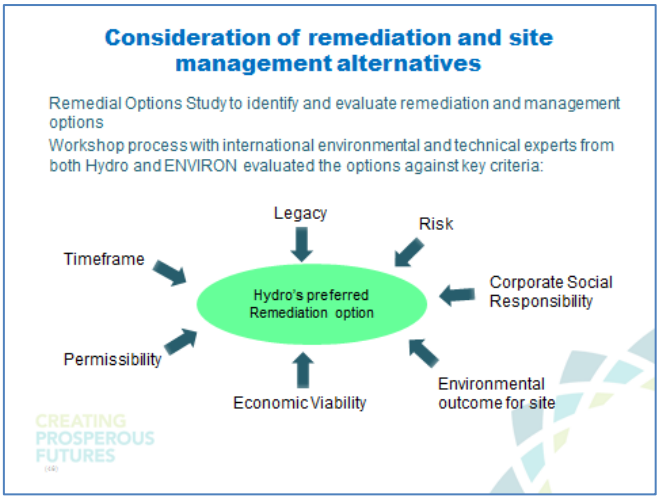
What is the remediation strategy that is suitable for all these materials? So as you recall we had to identify a number of factors that that remediation strategy had to be measured against. Those factors are listed there to look at legacy; so what sort of long term issues would be required to be managed? What the risk of that remediation strategy would be. That is both in terms of actual implementation technical risk and the risk of failure. Corporate social responsibility; so what impact would that remediation strategy have on the local community and what are Hydro's views on that?

Would the strategy deliver an environmentally acceptable outcome for the site? Previously mentioned, the development of the site could be realised, keeping in mind, the only motivation to remediate the site is to allow the redevelopment. There isn't any obligation to remediation the site, there isn't any risk to human health or the environment as the site sits now. It is theoretically possible that we could continue to manage the site as it is indefinitely.

The process, of course has to be economically viable, it has to be permissible under NSW regulations and it has to have a realistic timeframe. Again, probably linked significantly back to redevelopment of the site.



We looked at a number of alternatives, we looked at each of the individual components and we looked at them in in a combined way and identified there were a number of alternatives that we could measure against those criteria.

The first is to maintain the status quo. Another was to upgrade the existing capped waste stockpile and

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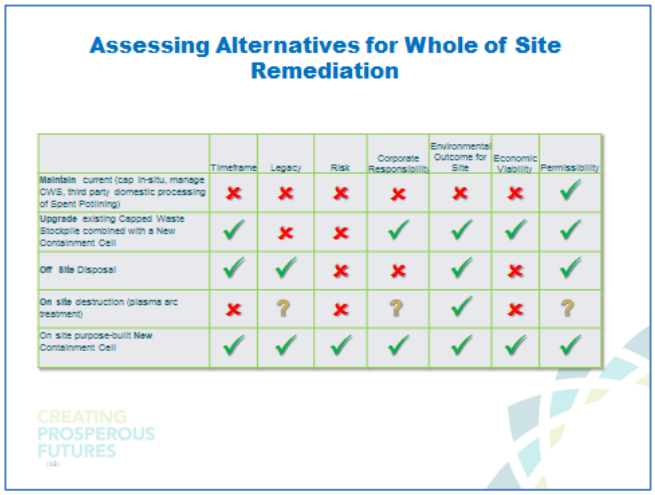
potentially combine that with a new cell adjacent to it that contained the other materials in. We have looked at offsite disposal, commercial landfill or commercial disposal offsite. We investigated on site destruction that would include technologies like plasma arc. We have had contact with suppliers for plasma arc. We have looked at treating for disposal. Are there possibilities of treating the contaminated soils, treating the capped waste stockpile and of course we have also looked at creation or engineering design construction of the new containment cell.

Each of those alternatives was evaluated both qualitatively and quantitatively. So where figures were available, like costs, there is a quantitative measure where we can compare them. Where there were estimates for risk for legacy there were some qualitative assessments made. What sorts of potential risk were there? And for each of those it was very highly simplified to put it in a table like this, but what we identified is that, some of the options were more suitable or more preferable for the different criteria.



For example, the off-site disposal, which is potentially sending material to a SITA in Kemps Creek for an example? Clearly the timeframe could be met it's just a matter of putting it in a truck and driving it off to Sydney. Legacy would also be managed because selling the waste to a company like SITA. SITA takes on the legal responsibility for the management of that waste. However, we knew that in terms of the process, putting 180,000 cubic metres of waste material, some of which would be considered hazardous, and driving it from here to Sydney has significant level of risk and that wasn't

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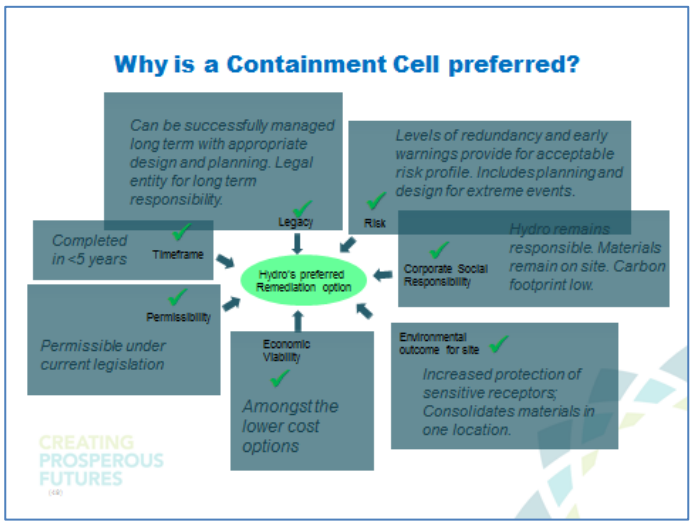
something we were considering as responsible. It certainly delivered an outcome for the site because the site had all the contaminated materials removed. Off-site disposal costs would be very high as you can imagine. Economically it wasn't the most suitable. But theoretically it would be permissible. There are no laws that we could identify that mean that that is not actually possible.

That type of analysis was done for each of those options. The option that stood out that was most suitable was that we can get an acceptable level of an acceptance if you like from our assessment to construct a new purpose built containment cell on the site. To contain those contaminated materials and the waste material in the capped waste stockpile.

Our estimate is that that can be completed within 5 years. That includes the process of designing the type of cell we are looking for and getting state government approval and executing the demolition and remediation works within 5 years. It is permissible under current legislation and we have had that recently re-confirmed. Something we have been looking at. It's not the cheapest option but certainly it's among the lower cost options.



A cheaper option would be to repair the existing capped waste stockpile and create a new cell in its location. Even cheaper again would be to maintain this status quo and not do anything.

In terms of the outcome of the site compared to other options. It's a better option but it certainly delivers the protection that is acceptable to be a long term use of the site. Hydro would remain responsible, it's an acceptance that we took to the corporate management board that when we looked and

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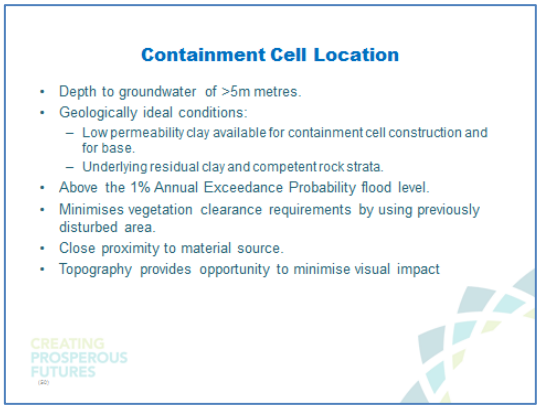
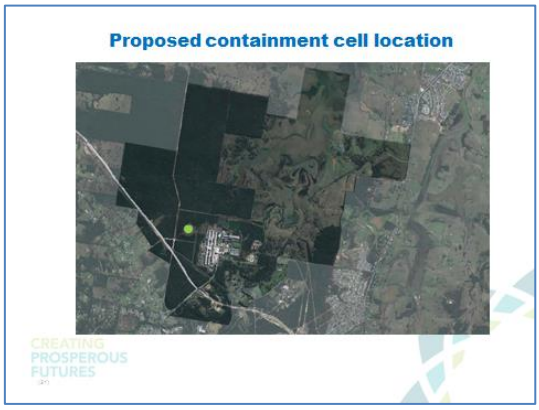
presented the development of the containment cell as our preferred strategy, that was something that the Hydro board had to agree to. They understood what that means, they understand that has a long term management responsibility to it and costs associated with that. That is something that is agreed to and Hydro remains responsible for that material as long as it is there.

The cell can be designed in such a way to provide levels of redundancy, levels of early warning and also can be planned for maintenance for catastrophic events. Similar to the long term responsibility is that with appropriate strategy and management plans, the cell can be maintained for the long term.

The thing we would have to do is to identify a location for that containment cell. So not only is the cell being identified as the preferred strategy for dealing with those materials but where in our land would we locate it? So we have done some assessment across the site to look at areas in particular that are elevated, that are away from surface water receptors, but also away from the ground water to even reduce the risk of contamination further.



That site has, as you know, it has been identified as the area that the clay was taken for the original capping of the capped waste stockpile. From that a conceptual design has been put together for a containment cell. You have seen the conceptual design that Environ put together. But essentially, it looks like that.



That's our thoughts in developing why a containment cell would be the logical and more reasonable and feasible remediation strategy for the site. Now clearly there are concerns around that, there are questions bring raised about the potential impacts and risks around that. If you don't mind, I would like to explore that a little bit further.

We have sketched this up on the whiteboard.

That's what we call a conceptual site model. So it's put the location of the containment cell roughly in a location and some of the key features around that containment cell. Geologically the containment cell is in a location where we know there are thick residual clays over competent rock and the groundwater system is well beneath where that cell is supposed to be located. The closest surface receptor from the cells location is what's called… actually it doesn't have a name. The "unnamed creek" flows into Wentworth swamp that probably drains into the Hunter River.

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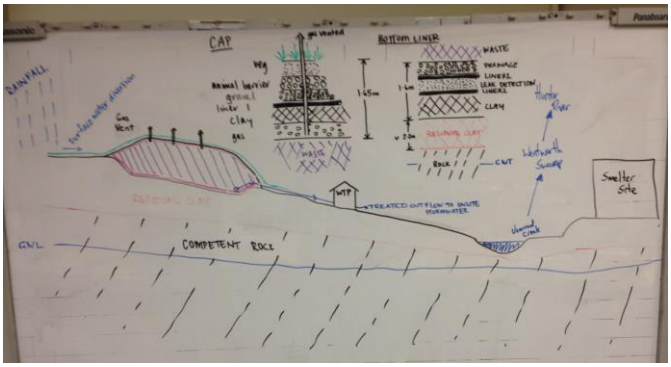
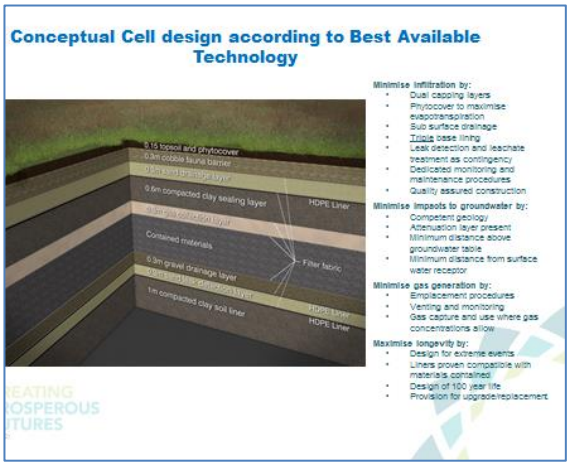


So I ask you guys, in terms of the materials that are going in there, what do you see as the biggest risk? Or the biggest potential outcome from containing material in a containment cell in that location, of that design?

Alan Gray: Did you say with the exception of the spent pot lining?

Richard Brown: At the moment, no spent pot lining.



Michael Ulph: Just that mixed waste that is in the capped waste stockpile.

Richard Brown: There is spent pot lining in it, in terms of the capped waste stockpile. It's all mixed together. 180,000 cubic metres of contaminated soils, including asbestos, generated from both the historical operation of the plant, from offsite, from demolition and there's 100,000 cubic metres of capped waste stockpile in there.

Colin Maybury: What's the SG [specific gravity] so I can work it out in tonnes? 180,000 cubic metres?

Richard Brown: 270,000 tonnes I think it says there.

Colin Maybury: So, roughly 300,000 tonnes? The biggest danger of course is, in this area is earthquake. We had one over at our place one time and it cracked the slab, cracked all the way across. It occurred in 2006.

Richard Brown: So what, in your opinion, would an earthquake do to this scenario?

Colin Maybury: First off, a crack underneath it or through it would allow the escape of the alkaline materials, the leachate. The leachate would straight away eat into the layers. You are saying… I don't understand the word "competent" rock.

Fiona Robinson: It's a geological term that basically refers to the structure of the rock in that it is not fractured. It doesn't have defects in it, or specific pathways as a result of fractures. So underneath

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here we have a very competent rock which is weathered to the residual clay which is why it's probably no surprise that we end up with the clay borrow pit as a suitable location. The clay was originally identified in that location to be suitable to be put on top of the capped waste stockpile. That whole ridge like where the clay borrow pit is, is a suitable location. It has suitable geology and depth to ground water. But the clay borrow pit area is already cleared so that's a benefit, environmental benefit that we don't have to clear the area. That's why it's been selected to some extent. But the competent rock refers to a type, formation that has very minimal defects. **Colin Maybury:** is that called a conglomerate? **Fiona Robinson:** No. **Colin Maybury:** Because most of this area is. **Fiona Robinson:** Yes, so no, up in this area is mostly siltstones and some shale but not very laminated and un-fractured. And then weathered to very tight low-permeability residual clay. So when we talk about permeability in liner structures when you're using GCL's [Geosynthetic Clay Liners] or HTPE's [High Density Polyethylene] which we have here, which are the thick plastic liners. We refer to them in orders of magnitude. They have permeabilities in the order of 10 to the minus 11 seconds. That is the rate at which water passes through them. They are effectively impermeable but then nothing is impermeable so they are "effectively impermeable". Clay like this can also get 10 to the minus 11 permeability but it is very difficult to test it to that level due to the inaccuracy of testing. We are looking at this clay being at 10 to the minus 11 meters per second as well and that is uncompacted. That's in situ uncompacted clay. We have got, the way you talk about leakage and what happens in an earthquake. The liner system would have to fracture to have leakage of the leachate. Has to cause fracture of two HTPE liners which have tensile strength built into them. They are structurally made and they have a tensile strength capability. And they are flexible. Then you have one metre of an engineered clay liner. That is winning of this clay and then re-compacting it so that you get rid of any natural weathering. Sometimes when clay weathers from rock you get preferential weathering of the clay that can cause higher areas of permeability. So a preferential flood	

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line. So you take some of this clay out and put it back in, in an engineered way so it is consistent in terms of the permeability it can achieve. **Michael Ulph:** Is the word compacted appropriate? **Fiona Robinson:** Yes, it is compacted under a very high level of earthworks QA [quality assurance] testing, that they would apply when you put that down. And then you have, underneath that the residual clay, which is the in situ clay, that would remain there, we wouldn't pull that out it, it would sit there underneath, and then you have competent rock, and then you have the water table. So for a pathway to form, if this base liner, if you were to cause a fracture between these liners you have one liner, then a leak detection layer which allows you to identify leaks in the upper liner, then you have another liner, and then clay and then you have to find a pathway through all of this into the groundwater table. Then once you get to the groundwater table, any leachate has to find a flow path to the receptor. The receptor for this system, for the groundwater in this system is not the unnamed creek. The unnamed creek is a surface water receptor. It is ephemeral, which means it is not always running, doesn't always have water in it, it relies on rainfall. So when there is no rain around the creek doesn't flow. It is not a permanent water course. And so this groundwater system sits below that. It would feed much further away, possibly to the Wentworth Swamps, but possibly not till the Hunter River. So it is some distance for leachate to travel from this point, to travel through the competent rock before it would reach a point at which it would discharge into a surface water body and come into contact. As a ground water plume migrates along that pathway it attenuates [lessens, breaks down]. So plumes don't often make it very far from their source because of the process of attenuation. Attenuation is where the mechanics of movement. Water moves like air, if you let off a smell, by the time it gets to that side of the room it's attenuated because its dispersed, its broken down, it's been absorbed into things. Water does the same thing, when water passes through all of this very slowly it will stick to the soil, the compounds within the leachate will stick to the soil, they will change form, they will disperse out, and so by the time it were to	

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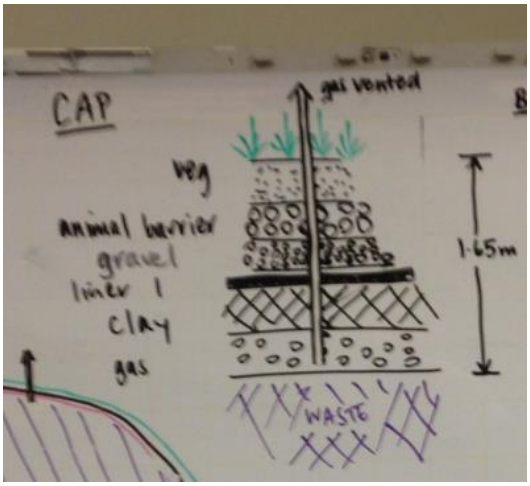
reach a receptor, the concentration difference from this point to the receptor can be many many times smaller.

Richard Brown: How does the water get in the cell?

Fiona Robinson: When we have the capped waste stockpile. The capped waste stock pile has moisture in it, we know that. We are going to be dewatering before we transport it, because we can't move it with water running out of it. So it will be dewatered of its free water. That means that the liquid within it will be drained away as much as it can be but without any active form of drying. Then it will be trucked to the capped waste stockpile [Fiona means the containment cell] where it will be placed.

A certain level of compaction will be achieved on that so we can minimise any future settlement. So there is inherent water in the capped wasted stockpile but it is not free draining water. Once the lid is put on, we will get back to construction in a minute, but once this cap is finished, there is very little water that will get through.

Part of the design process is to model that. So you can model, this is the cap, the cap is like a vegetation layer which in itself will remove moisture from the profile.



Then it has an animal barrier which is basically because we have rabbits around here and we don't want them digging into the cap. The animal barrier is large cobble size material to stop that occurring. Then we have a gravel drainage layer and the purpose of the gravel drainage layer is water flow. It sheds water, it is on a slope. The purpose of this is to move water horizontally, not vertically. And then we have a plastic liner, then a clay liner and then

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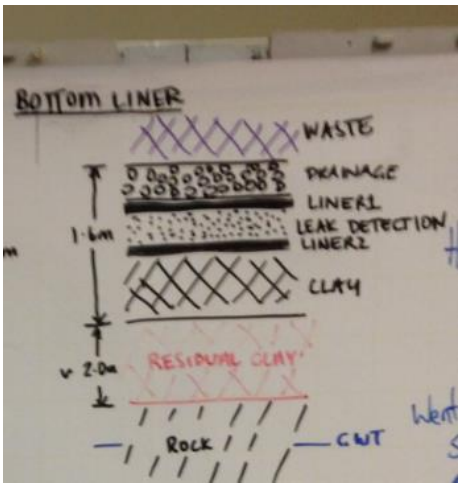
underneath that is our gas collection layer and underneath that is the waste.

So water has to make its way through this profile which is a very very very small percentage of water that will make its way into the landfill. This is designed as a dry landfill so the intention is that no water makes it through but as I said before, nothing is impermeable so there is some very small proportion of water that will make its way in there.

But on top of that there is a fail-safe mechanism which is a leachate collection system. In a municipal landfill this leachate system is incredibly important because municipal land fill breaks down and the waste material is generation liquids. But we have none of that content. We don't have materials in the waste that are going to break down and generate water. So you can't really compare this to a leachate collection system that is required for a municipal landfill. But it will be designed that way.



The idea is this whole base has drainage capability to a central sump which collects leachate. Then that is actively pumped out and treated in a water treatment plant. But the design is that this is a sporadic process because it is not anticipated that leachate will be of significant volume that this will be required to be operating all the time. It's a contingency mechanism.

So the design is that very little water makes its way into here. We have inherent water that will be placed in there at the start. We may be required to remove some of that with this system. This will be able to be monitored and switched on if required.

So you are not getting a big head of water, of leachate building up within this waste. And that's how the design works.

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So even if we do have an earthquake, which causes a fracturing of this system, we have a very small amount of water that has to pass through a lot of materials through very low permeability clay into low permeability rock and travel a very long way before it is going to reach a receptor. **Richard Brown:** What happens if it gets to a receptor? What is the worst thing that can happen? **Alan Gray:** I think one of the things from talking to the public. Looking at being plastic and clay and the two earthquakes that we've had in Newcastle and Ellalong, and I'm not an expert but I'd expect to see probably see very little in that bit other than a ripple, not breaking up houses or concrete floors. But, I believe from memory, the pylons in the expressway had to be withstanding an 8.5 earthquake. Is there any way that you can qualify that for the public asking the similar questions that we are asking. Is there any way that you can get a design or build, or 'factor' in that it won't fracture under 5, 6, 8 or whatever? It would be good if you could, that would dispel a lot of the public's fear. **Fiona Robinson:** Yes. One of the requirements of the detailed design is to design this for, 1. For life expectancy, which is 100 years plus, and also to design it with safety factors built in for events like that. So that will look at the structural elements of it. That comes down to the way that the clay is placed and the strength of the liners. So yes it can be built in and designed. **Alan Gray:** What we really need to be able to see, when it comes out is that you have a number there. That this is designed to withstand a 5, 6, 8 or 8.5. **Michael Ulph:** I wonder if there are any examples of say Summerhill. Summerhill is a landfill, it's a well-designed one and it would have some of these layers. Clearly not as highly engineered as this. But, I wonder if there is any sort of thing around that happened at Summerhill when the earthquake hit in 1997. **Rod Doherty:** 89 **Michael Ulph:** 89, sorry. Well something like that? To my mind… **Fiona Robinson:** I think one of the bigger risks for earthquake; it's not really what the liner does but what the cap does. So where you have earthquake with a movement, shift or a wave and it's what this	

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does on top. Does this settle? Does it move? Does it cause the liner to shift or crack? And how do you manage that? That is probably more of a risk then what this underneath does. **Colin Maybury:** There is one thing I saw on the net the other day and that is they have a large amount of this spent pot lining that they are going to store in a particular site in America, and they're putting it into a great big balloon, its actually going into a balloon and sealed inside there, on top of the ground. Why does it necessarily need to go underground? **Fiona Robinson:** It's not really. **Colin Maybury:** The balloon struck me as a possibility, straight away there it is because it is observable, you can see what is going on. **Fiona Robinson:** No, it doesn't need to go underground. But all that would really happen is this would shift up and you would still have to have the same monitoring and leachate collection that you would have here. What this does is just reduce visible impact. It just reduces the height of it. It's a space gaining mechanism. **Colin Maybury:** Yeah but what you want to remember of course is, we were told that all the spent pot lining was going to be treated, the Norsk Hydro, the parent company came out and said that they were making more money out of it by transferring it into Rockwool, and consequently now we are being told in very great detail that this is better. **Fiona Robinson:** So, what we are talking about here… **Colin Maybury:** It ticks all the ... **Fiona Robinson:** Yes it does and we can talk about that probably. **Kerry McNaughton:** We will get to it. **Colin Maybury:** You can justify anything you like, you know. **Fiona Robinson:** We are talking here about the capped waste stockpile and contaminated soil including asbestos, and demolition waste that's what we are talking about here now, we haven't got to spent pot lining. **Toby Thomas:** How do you maintain this in perpetuity? What's your definition of "in perpetuity"?	

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Fiona Robinson: It's forever. That's, you can probably answer it better.

Colin Maybury: That brings up the other question Fiona. Who's going to be looking after it? Hydro or Norsk Hydro?

Richard Brown: Well I think what we will find; I don't know the answer to that question Col. But that's something that clearly we have to work through. It's likely, and you have to define this as part of the EIS, to look at those long term management structures, it's one of the requirement measures that have been given to us that we have to define how that long term management is going to play out.

My understanding is that when these sort of facilities are established, it's possible that what would be required is some kind of financial bond or trust to be established so that those contingencies, that operational and maintenance component can be paid for via the trust and has contingencies built in.

So that if you have an earthquake and had a cap shift or you had a major storm event and a failure of the cap then potentially you could repair that or even replace the whole cap.

That in itself is independent of an owner. So if you had sufficient funds and I don't know how that fund is established, or who owns, or who manages the long term trust. But that means that it's is independent of a company like Norsk Hydro.

If, in the worst case scenario, there is an issue that can't be managed by that, by law Hydro is responsible.

Colin Maybury: Who is Hydro?

Richard Brown: What do you mean 'Who is Hydro?'

Colin Maybury: Who is Hydro? Hydro is a separate company to Norsk Hydro.

Richard Brown: No.

Colin Maybury: Norsk Hydro is a massively wealthy Norwegian company.

Richard Brown: That's the company. You just follow the chain, if it's Hydro Aluminium Kurri Kurri which is a fully owned subsidiary of Norsk Hydro. If Hydro Aluminium Kurri Kurri doesn't exist the responsibility goes to Norsk Hydro. If Norsk Hydro don't exist.

Colin Maybury: Pasminco didn't work out that way.

Fiona Robinson: Pasminco went into receivership. You can't really make comparison with Norsk Hydro.

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Richard Brown: I've heard my boss previously say that in the situation like this, if you have got, basically "the polluter pays", essentially. If there is a risk and an impact then the polluter pays. So the regulator will chase the polluter, in our case we are currently "the polluter". Hydro are responsible for any environmental impacts from this. Who are hydro? Hydro are as you know, are a fully integrated, vertically integrated aluminium company. With 16,000 employees with the shares listed company with half the shares owned more or less by the Norwegian State. They are a pretty secure company. Let's say Hydro doesn't exist, who is the next polluter? If we are talking about the capped waste stockpile one thing we can say is Hydro didn't put it there. Hydro is managing a legacy that they have acquired. So they would go after the previous owner to that. The previous owner was VAW. Who owned VAW? They were owed by a company called EON, they are one of the largest energy generating companies in Europe, a German company. So they would be the ones who have to go. If it wasn't EON, who was it prior to that? It was Alcan. Who is Alcan now? They are Rio Tinto. That's the next company that they would go after. If that didn't happen, if Rio Tinto didn't exist, you haven't got Norsk Hydro, you haven't got the Norwegian state, you haven't got one of the largest energy producers in Europe and you haven't got the world's largest miner existing, we are in a different world. We are in a whole different place. So in terms of the long term management of the site, you probably can't get a better chain of custody if you like. In terms of having responsibility and taking responsibility for it. **Toby Thomas:** I think that really needs to be further defined. If you want us to help you sell this to the general public that's a question and I am part of the general public also, that I'd like an answer for. What are the guarantees for keeping perpetuity that is this going to be catered for? **Michael Ulph:** Can I just mention something else? There is another similar structure that's been put up now by NSW state government or federal government about biodiversity offsetting and bio banking schemes. Where money is put into a trust and from that trust, money is taken out each period for whomever in managing that conservation area.	

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So in Hydro's sense. When they build that bio banking site or biodiversity offsetting area there, whoever looks after it will be paid to look after it out of the trust in perpetuity. I think it is the state government, or is it the federal? **Richard Brown:** It is the state. OEH manage that. **Michael Ulph:** OEH? So that is happening now isn't it? I have seen a presentation on it. That sort of thing is happening right now, funds are set aside and from those funds money is paid to people to manage that. **Fiona Robinson:** I might also add. Richard went through the example of offsite disposal and talked about going to SITA. SITA [now SUEZ Environnement] are a privately owned landfill in Sydney that can take this kind of material. One of the reasons why that didn't stack up in "corporate responsibility" is that effectively you are selling your responsibility to someone else and they have to manage that forever, that material. That wasn't Hydro, Hydro preferred to be responsible for it even though that is what it means. It means to keep it on site and be responsible for it. They could have taken that option and sold it to someone else. But it wasn't considered to be a corporately responsible position to take. Looking after these. There are lots of examples of different structures that are used to manage sites like this. Contaminated land is frequently capped in situ. BHP, is a classic local example I suppose that the BHP main site is a capped site. Somebody has to be responsible for that. It is not dissimilar to this only that this has got a bottom on it and BHP's does not. It is not dissimilar in terms of how they have to manage that and fund that into the future. And there are different structures for different sites and I guess that's why we haven't yet come to a conclusion because there are a number of different ways to set up these structures and we have to work through that. **Richard Brown:** It is something that we need to understand, clearly, as I said. It is part of the environmental assessment requirements that have been given to us, that will come out, we will work through it, discuss it with you and the community. **Colin Maybury:** You spoke about this, how you could store it down at Eastern Creek or wherever it is, how much does it cost to put it in there? **Fiona Robinson:** Well the cost varies depending on your material. Asbestos is around $300 a tonne.	

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Colin Maybury: Spent pot lining?

Fiona Robinson: I don't know.

Richard Brown: They haven't got any so I'm sure they would have to, "model it" and come up with a number.

Colin Maybury: I know Weston Aluminium was saying it cost them $70 a tonne to put it in their waste.

Fiona Robinson: Putting it…to put it where?

Colin Maybury: To put it down at Kemps Creek.

Fiona Robinson: Well they have an excellent deal I'd just keep doing that. Because as you know yourself you can't take your mattress to the local landfill for $70 a tonne.

Toby Thomas: It's about $62 a tonne in the municipal, in these areas anyway that goes straight to the state government. I worked out 23 million dollars would go to the state government if the state government posed the levy on Hydro to put it in the containment cell.

Michael Ulph: What is the levy these days? The metropolitan waste levy?

Toby Thomas: I thought it was 100 or something; it is about twice what it is up here. It's a bit over 100.

Michael Ulph: I understood it was over 100 dollars a tonne.

Toby Thomas: In this area it is less.

Michael Ulph: Yes.

Richard Brown: So I guess the other, and I asked the question deliberately, to ask if it fails what is going to happen? What is the worst case scenario? And I think to some degree we already know the answer to that because we have got one sitting there.

We know what happens if the capped waste stock pile leaks into the groundwater because it is just over there.

Colin Maybury: But you knew it was going to happen before you started.

Richard Brown: I didn't know, I don't know what they were thinking when they put it there.

So we know what happens if leachate from a material like this ends up in the groundwater because it is only happening from us a few hundred metres away. So as we talked about previously, we

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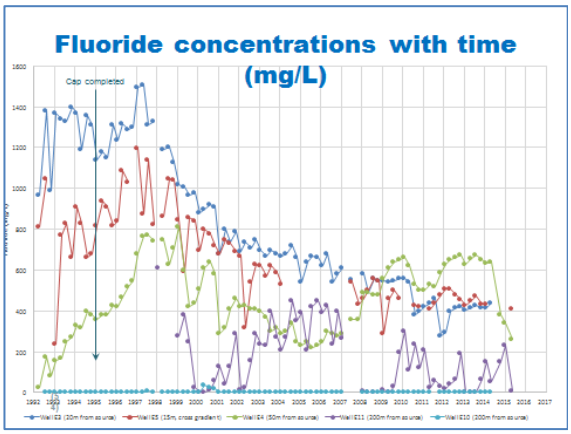
have leachate coming from here into the groundwater system that we can delineate by a series of wells and how that's coming to the surface.

Fiona Robinson: Can I point out here that the groundwater system on this side of the site is very different to the groundwater system on the other side of the site because of the geology.

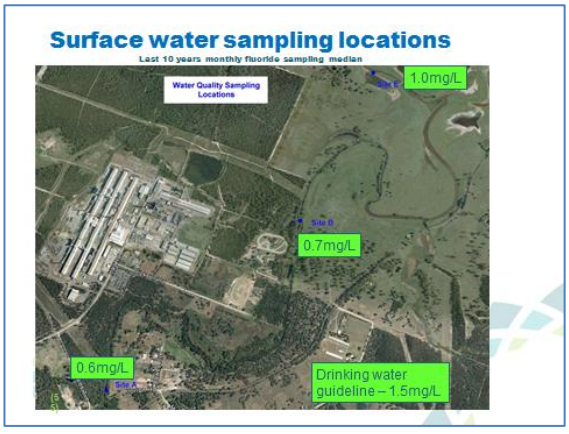


What we have on this side of the site is sand. It's a very shallow, rainfall fed, sand system that is very near surface and this is why we have… basically the capped waste stock pile in sitting on top and directly in contact with that sand. There is nothing protecting it. There is nothing stopping leachate from the capped waste stockpile now from migrating into the sand underneath except the fact that infiltration into the pile itself is now controlled by the cap.

But for 20 years it sat there, rainfall directly on it and you saw the leachate ponds within the bund and they were directly migrating down into the aquifer. And that is the result of that.

Richard Brown: As Fiona said we have monitored the concentration of fluoride in particular being, I guess, the major contaminant of concern. In those wells both close and further away, it is a bit hard to read, but got wells here that are 15 to 20 metres away from the toe of the cap down to 200 metres and clearly we have seen the caps effectiveness at reducing the infiltration going through the cap. So the concentrations are dropping off.

I guess a bit of interesting trivia, if it is trivia or not, is the leachate concentrations for fluoride that are coming out of there are less then what would be generated if it were a product from the Regain operation. So if we had processed material from Regain, it typically would generate leachates in excess of 600 mg/L.



Colin Maybury: But surely they are taking that fluoride off site anyway.

Richard Brown: Just as a point of interest.

Colin Maybury: But that went up to 1400 parts per million. Where two is the allowable level.

Richard Brown: As I understand it the drinking guidelines are 1.5. So it's getting out of the pile. It was getting out at close to 1400 milligrams now it's at 5-600. It's coming to the surface. It is having an impact on vegetation in that area and at the moment, well, for the last 10 years. We have been measuring concentration at the nearest surface receptor; the actual nearest direct surface receptor is a small pond

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in here. We are measuring concentrations in that certain receptor, which are beneath drinking water guidelines.	
So, as Fiona said, what's happening is that material as its even perching to the surface is attenuating before it even gets to the surface receptor and that's on the surface. Not even in the groundwater system because the groundwater system is quite contained.	
Fiona Robinson: There is inherent fluoride in Swamp Creek because of the discharge from the water treatment works, sewerage treatment works. Fluoride about one in our drinking water that is added to help benefit. That is why you have a background fluoride level in that creek.	
Richard Brown: So even just to confirm, impacts on biodiversity, you will remember that that surface receptor, that creek. There's a dam that sits in front of that creek and we have done some work to look at, even if it is at that lower concentrations, was actually having an impact on the life that exists down there. And our assessment concluded there were no greater impacts in that area compared to another dam that's located about four kilometres from here. Elsewhere on site away from any risk of impact from capped waste stockpile.	
So arguably the observed impacts from a similar situation are currently in a situation where they're not presenting and unacceptable risk to human health or the environment.	
Then there is the next question. That's just dealing with the capped waste stock pile, all the soils, the demolition waste and the asbestos. Then what do we do with spent pot lining? Again this is how we develop this process, how do we think about this?	
We know where spent pot lining is, it's in the sheds, it's in the pots, and we know exactly how much we have got. We know there are treatment options for it, we have been using them. We have been using them for 10 years. So what do we do with it? So we go through a similar type of process, understanding what are the options for it? What are our views on these options? How does that work?	
So what do other people do with it? You have seen this. This is a really interesting paper and I am happy to send copies to you or give you the links if you want to reference it yourself. But this is a paper that was written in 2013 and I am going to pull quite a bit of material out of it because I think it is quite interesting. And it gives a good overview of the options that aluminium industry has tried, is trying,	

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and is using for spent pot lining.

You can see there, this ranges from storage in lined and unlined sites. It's using SPL as in an untreated form for use. It's also got industrial processes that are used to process the material. Just a couple of things to point out, some interesting things, we have got our own unlined site, here on site, as you know. Some that aren't mentioned on here that we know about that are relevant are mixed waste stockpiles including spent pot lining in Tasmania at Bell Bay as there are at Point Henry.

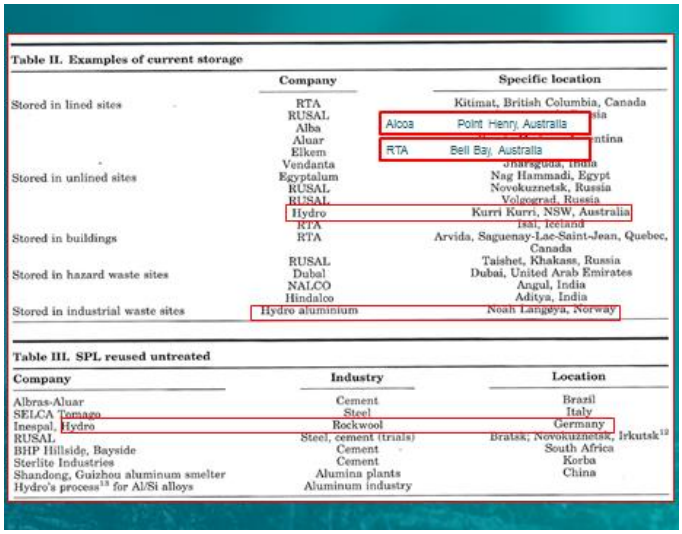

Table II. Examples of current storage

	Company	Specific location
Stored in lined sites	RTA	Kitimat, British Columbia, Canada
	RUSAL	
	Alba	Alcoa Point Henry, Australia
	Aluar	
	Elkem	RTA Bell Bay, Australia
	Vendanta	
Stored in unlined sites	Egyptalum	Nag Hammadi, Egypt
	RUSAL	Novokuznetsk, Russia
	RUSAL	Volgograd, Russia
	Hydro	Kurri Kurri, NSW, Australia
Stored in buildings	RTA	Arvida, Saguenay-Lac-Saint-Jean, Quebec, Canada
	RUSAL	Taishet, Khakass, Russia
Stored in hazard waste sites	Dubal	Dubai, United Arab Emirates
	NALCO	Angul, India
	Hindalco	Aditya, India
Stored in industrial waste sites	Hydro aluminium	Noah Langøya, Norway

Table III. SPL reused untreated

Company	Industry	Location
Albras-Aluar	Cement	Brazil
SELCA Tomago	Steel	Italy
Inespal, Hydro	Rockwool	Germany
RUSAL	Steel, cement (trials)	Bratsk, Novokuznetsk, Irkutsk[12]
BHP Hillside, Bayside	Cement	South Africa
Sterlite Industries	Cement	Korba
Shandong, Guizhou aluminum smelter	Alumina plants	China
Hydro's process[13] for Al/Si alloys	Aluminum industry	

As Col said, Hydro has also used the option of processing this material directly through Rockwool. That's only been fairly recently, I would say the last four years. And that's still being developed.

The other are that Hydro uses, has used typically. What does Hydro do? What is Hydro's experience with spent pot lining? That's a combination of in-situ capping and filling and also they send it to this place.

So prior to 2013, all of the spent potlining generated ends up on this place that's called, Langoya. A bit hard to see my little map here but this is Oslo, this is the Oslo fjord. Langoya is an island located in the Oslo fjord previously a limestone mine, where now hazardous wastes are placed.

So you can kind of see it is a whole in the ground essentially where materials are placed. Clearly this is a commercial landfill probably not unlike SITA at Kemps Creeks, it's managed by a company called NOAH, I can't tell you what the translation is but that is the company name. They would have fairly stringent requirements for managing the potential

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environmental impacts and monitoring.

Toby Thomas: So just on that, at the moment is there any first cuts still going there? It doesn't quite say that at the bottom.

Richard Brown: At the moment no there's not.

Toby Thomas: There's no first cut so everything that's first and second cut go in there?

Richard Brown: That's right.

Toby Thomas: But now there is no first cut?

Richard Brown: First cut now is going to Rockwool.

Toby Thomas: Rockwool first cut.

Richard Brown: Yes. What I can tell you about that, is the original agreement Hydro had about first cut has been taken off. Rockwool are baulking at that a little bit and that's based on the cost of energy essentially. So the first cut as a carbon source is being used to offset energy costs as energy costs dwindle or go lower, as you know now from previously this year, coal prices are very low so for a company like Rockwool, similar applications of the cement industry, the use of materials like spent pot lining is far less attractive. So they tend to push back and that's where you get the issue around how much capacity there is in the market to absorb this kind of material and we will touch on that later.

Just some other examples of what happens to spent pot lining. This is another Hydro smelter, another Hydro location; it is on the west coast of Norway a smelter called Husnes. This whole area between the islands here pretty much and this road is a landfill that was filled with smelter waste including spent pot lining since the smelter was begun.

This whole boat harbour is built from the landfill. The most recent area which is down here was capped in 2007. Obviously with the approval of Norwegian authorities this was an accepted situation.

Fiona Robinson: It is probably also worth mentioning there's a lot of monitoring data in that estuary.

Richard Brown: In the fjord, yes. They do regular testing of the water in an around here, and they're not able to identify any of that unacceptable impacts.

Colin Maybury: Excuse me Richard. You are forgetting one thing. Until some decade ago, it was quite acceptable in Norway to put the spent pot lining into the ocean and allow the wave motion to dissipate it.

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Richard Brown: Yes well that's merely an example.

USA. This is an example, only an example but one of a number of examples where spent pot lining is stored in containment cells on site. This is a smelter currently still in operation in Washington State, called Intalco, owned by Alcoa, sorry about the text here. Do you want to read it out Michael?

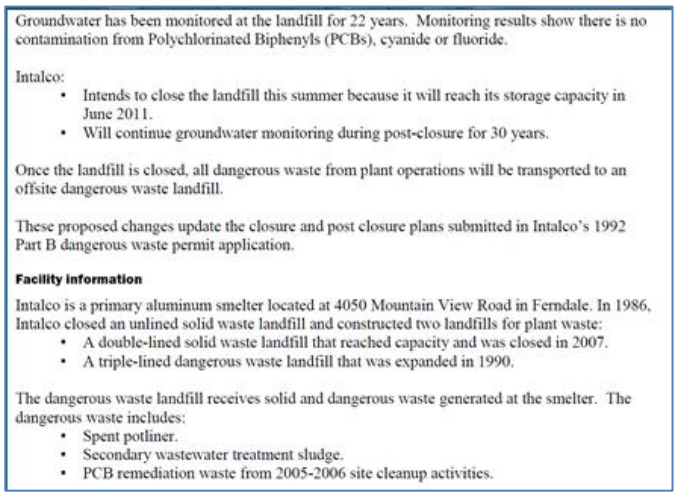
Michael Ulph: "Groundwater has been monitored at the land fill for 22 years. Monitoring results show there is no contamination from polychlorinated biphenyls, (PCBs), cyanide or fluoride."

"Intalco"

That's the two bullet points down a little bit.

"Intends to close the landfill this summer because it will reach its storage capacity in June 2011" and "Will continue ground water monitoring during post closure for 30 years."

"Once the landfill is closed all dangerous waste from plant operations will be transported to an offsite dangerous waste landfill. These proposed changes update the closure and post closure plans submitted in Intalco's 1992 part B dangerous waste permit application".



Groundwater has been monitored at the landfill for 22 years. Monitoring results show there is no contamination from Polychlorinated Biphenyls (PCBs), cyanide or fluoride.

Intalco:

- Intends to close the landfill this summer because it will reach its storage capacity in June 2011.
- Will continue groundwater monitoring during post-closure for 30 years.

Once the landfill is closed, all dangerous waste from plant operations will be transported to an offsite dangerous waste landfill.

These proposed changes update the closure and post closure plans submitted in Intalco's 1992 Part B dangerous waste permit application.

Facility information

Intalco is a primary aluminum smelter located at 4050 Mountain View Road in Ferndale. In 1986, Intalco closed an unlined solid waste landfill and constructed two landfills for plant waste:

- A double-lined solid waste landfill that reached capacity and was closed in 2007.
- A triple-lined dangerous waste landfill that was expanded in 1990.

The dangerous waste landfill receives solid and dangerous waste generated at the smelter. The dangerous waste includes:

- Spent potliner.
- Secondary wastewater treatment sludge.
- PCB remediation waste from 2005-2006 site cleanup activities.

"Facility information" is the bold piece you can see. It says "primary aluminium smelter located at 4050 Mountain view Road in Ferndale. In 1986 Intalco closed an unlined solid waste landfill and constructed two landfills for plant waste. A double lined, solid waste landfill that reached capacity was closed in 2007 and a triple lined dangerous waste land fill was expanded in 1990. The dangerous waste landfill receives solid and dangerous waste generated at the smelter. Dangerous waste includes"

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And that is the last three dot points, “spent pot lining, secondary wastewater treatment sludge and PCB remediation waste from 2005-6 site clean-up activities.” **Richard Brown:** So a smelter recently closed very similar in size and technology to our own is in the UK. This is from the Rio Tinto 2009 annual report, environmental report showing the landfill cap as it’s been finalised in 2002 and the final cap. **Michael Ulph:** 2007. **Richard Brown:** Sorry, 2007. And the cap is 2009. Again the Woodburn landfill previously used for the primary for disposal of spent potlining was successfully closed and capped in 2007. So that’s the UK. Closer to home, point Henry in Victoria, Geelong. They have, as you know, recently closed the smelter in Geelong. They also have two spent pot lining landfills in Geelong. So they are just some examples of a lot that there is spent pot lining in landfills and they are not old. It is not like this is a technology that is stopped, clearly the industry and regulators are looking towards reusing it, but where that is impractical for a range of reasons, this technology is still used. **Toby Thomas:** Just on that Point Henry. That spent pot lining land fill is that from its previous operation? What’s going to happen with what comes out of the demolition of the smelter? **Richard Brown:** That I can’t tell you, Toby, I am not sure. **Toby:** So you are just pointing out that’s what has happened in the past, that’s not what’s going to happen? **Richard Brown:** Yes that’s right; I don’t know what they are planning on doing. **Richard Brown:** So there would be a reference, if you want to look it up; it’s called “an overview of useful methods to treat, recover or recycle spent pot lining”. In terms of processes that are available for treating or reusing spent pot lining, there are also a number of processes that have been developed over the years. It’s been an industry issue, an industry problem. There has been a lot of money, a lot of time and effort put into developing these processes.	 

Notes	Action

Unfortunately, as you can see through some of this is that quite a lot don't even get off the ground. There is some very difficult issues to deal with spent pot lining. So, as an example of a couple, the Alcoa smelter in Portland, Victoria, they developed along with their company a technology they called Ausmelt which is what they call a submerged lance technology, a little bit like a blast furnace. Basically put in the spent pot lining, put a lance in, they inject oxygen and they try and use the carbon in there to generate heat. Enough heat to kill off all of the nasties and then it produces a glassy phase slag. That glassy phase slag was intended to be used and ground up for road fill, and those sorts of things. The gases given off were then captured to returned back into the smelters operation. So it was intimately linked to an operating smelter.

That technology never really got developed. They couldn't get the technology to work, and the material that was given off from it was not suitable for its end use.

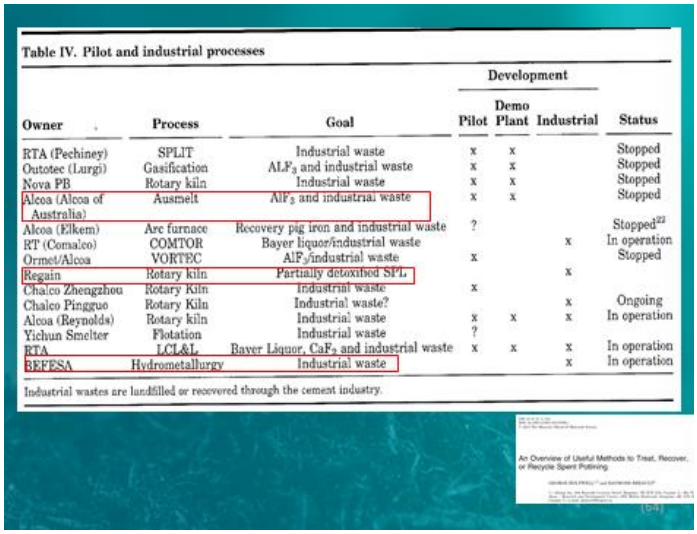


Table IV. Pilot and industrial processes

Owner	Process	Goal	Development			Status
			Pilot	Demo Plant	Industrial	
RTA (Pechiney)	SPLIT	Industrial waste	x	x		Stopped
Outotec (Lurgi)	Gasification	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 (Comalco)	COMTOR	Bayer liquor/industrial waste			x	In operation
Ormet/Alcoa	VORTEC	AlF_3/industrial waste	x			Stopped
Regain	Rotary kiln	Partially detoxified SPL			x	
Chalco Zhengzhou	Rotary Kiln	Industrial waste	x			
Chalco Pingguo	Rotary Kiln	Industrial waste?			x	Ongoing
Alcoa (Reynolds)	Rotary kiln	Industrial waste	x	x	x	In operation
Yichun Smelter	Flotation	Industrial waste	?			
RTA	LCL&L	Bayer Liquor, CaF_2 and industrial waste	x	x	x	In operation
BEFESA	Hydrometallurgy	Industrial waste			x	In operation

Industrial wastes are landfilled or recovered through the cement industry.

An Overview of Useful Methods to Treat, Recover, or Recycle Spent Potlining

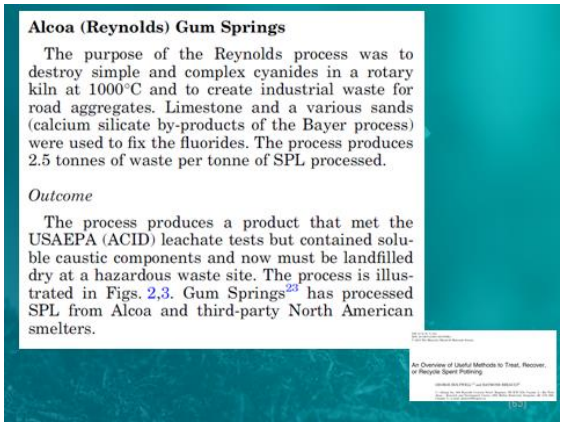
Befesa is another one which is reasonable relevant to the Australian smelters because the likes of Tomago and Portland have exported significant tonnages to Befesa in Europe. They used the spent pot lining to, I really don't know, they use it for similar type of applications but I think they also use it in the refractory based industries.

What is interesting to note is the goal a lot of these processes is not necessarily to produce a product that has any value. It's really just to produce a waste that is somehow less, in its properties, or different in its properties, to the material that went in there.

Notes	Action

Of course we have Regain that you are all familiar with. A couple of interesting things that come out of this. Alcoa as we saw, the smelter that was there before was an Alcoa smelter. Alcoa was also developing technology to process it. Alcoa is one of the largest aluminium companies in the world. Reynolds is another aluminium company Alcoa have bought.

So they originally had this technology which they believed would be able to treat spent pot lining to a point where it could be land filled to normal solid waste type landfills. So you can see that's described how the technology works, they use a rotary kiln, they heat it up to an elevated temperate, unlike Regain for example, they actually go to 1000 degrees. They actually add materials to it to try and neutralise the fluorides. The results of that added materials means they produce 2.5 times the amount of material that actually goes it. So in terms of the total volume of waste material it actually increases by 2.5 times.



Alcoa (Reynolds) Gum Springs

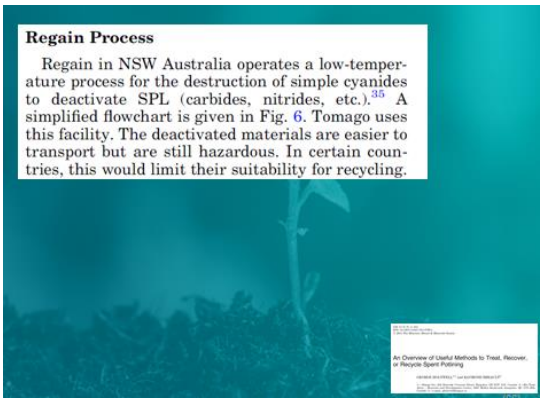
The purpose of the Reynolds process was to destroy simple and complex cyanides in a rotary kiln at 1000°C and to create industrial waste for road aggregates. Limestone and a various sands (calcium silicate by-products of the Bayer process) were used to fix the fluorides. The process produces 2.5 tonnes of waste per tonne of SPL processed.

Outcome

The process produces a product that met the USAEPA (ACID) leachate tests but contained soluble caustic components and now must be landfilled dry at a hazardous waste site. The process is illustrated in Figs. 2,3. Gum Springs[23] has processed SPL from Alcoa and third-party North American smelters.

Colin Maybury: Surely, that's inert, it's not toxic.

Richard Brown: No actually. If you read the next part. The process produces a product that leachate tests contain soluble caustic components that means it must be landfilled prior to hazardous waste storage facility.



Regain Process

Regain in NSW Australia operates a low-temperature process for the destruction of simple cyanides to deactivate SPL (carbides, nitrides, etc.).[35] A simplified flowchart is given in Fig. 6. Tomago uses this facility. The deactivated materials are easier to transport but are still hazardous. In certain countries, this would limit their suitability for recycling.

Colin Maybury: I apologise.

Richard Brown: So that process doesn't produce a product that is suitable for general waste. It ends up back in the industrial waste.

Regain, our friends on site here. It's some interesting comments from the authors of the paper. You can see they made a mention to Tomago there, the conclusion they have reached here is that their process de activated the materials which we talked about. It no longer has the reactive properties. However, that's pretty much all it does it makes the transport easier, less hazardous. Their conclusion is that that material isn't necessarily, depending on regulations, may not even be suitable for recycling.

CONCLUSIONS

The aluminum industry has made some progress with the SPL issue by recognizing that landfilling in unlined sites is no longer acceptable by most local communities and by making use of industries that accept it with or without treatment. However, there is no universal solution for spent potlining. The intrinsic difficulties linked to the specific chemistry of SPL, local legislation, and the proximity and size or possible end users make it even more of a challenge. For example, in North America, the concentration of primary aluminum smelters, in Quebec in particular, compared with the size of the cement industry within acceptable transportation costs, makes it impossible to accept all the SPL produced just taking into account the sodium limitations in the final product. Whereas in France, for example, or other countries, legislators made an exception to allow SPL treatment in cement plants because it represented a real option for SPL. Another example only applicable in Europe is the SPL treatment with the salt recovery process as done by BEFASA because salt recovery is not done in North America; the salt cake is landfilled. Recently, with the shutdown of smelters in the United States and many countries in Europe, the focus of SPL treatment will shift to the Middle East, Russia, India, China, and South America.

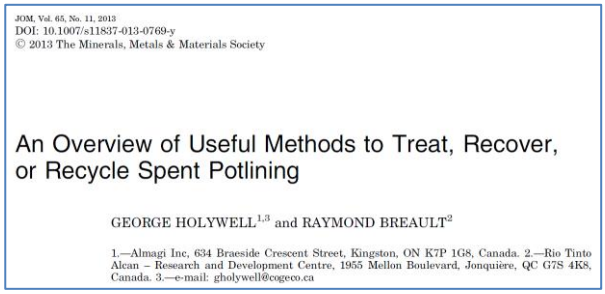
Not my conclusion. That is theirs.

A lot of words I apologise for this, but I think when we get the minutes out, this is really worth reading because it highlights the challenges that not only we face but the industry in general. It acknowledges that there are processes available for treating spent pot lining but what it says is that there are difficulties that are linked to the specific chemistry, local legislations,

Notes	Action

the proximity and size of possible end users that make it a challenge.

Reference:



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An Overview of Useful Methods to Treat, Recover, or Recycle Spent Potlining

GEORGE HOLYWELL[1,3] and RAYMOND BREAULT[2]

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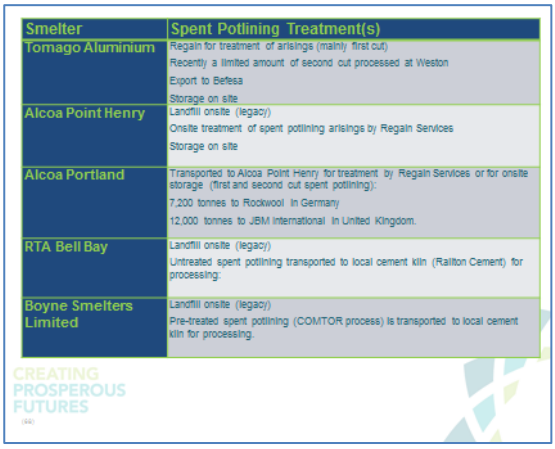


Smelter	Spent Potlining Treatment(s)
Tomago Aluminium	Regain for treatment of arisings (mainly first cut) Recently a limited amount of second cut processed at Weston Export to Befesa Storage on site
Alcoa Point Henry	Landfill onsite (legacy) Onsite treatment of spent potlining arisings by Regain Services Storage on site
Alcoa Portland	Transported to Alcoa Point Henry for treatment by Regain Services or for onsite storage (first and second cut spent potlining): 7,200 tonnes to Rockwool in Germany 12,000 tonnes to JBM International in United Kingdom.
RTA Bell Bay	Landfill onsite (legacy) Untreated spent potlining transported to local cement kiln (Railton Cement) for processing:
Boyne Smelters Limited	Landfill onsite (legacy) Pre-treated spent potlining (COMTOR process) is transported to local cement kiln for processing.

CREATING PROSPEROUS FUTURES

A good example here is how the North American smelters have challenges compared to the size of the industry that its' capable of being received into.

So this is an issue, and this is the reason why there's not one technology, one sort of solution where everybody is processing their spent pot lining in a certain way. It's because it is really dependant on, where you are in the world and the situation that you have got directly.

We have touched on a little bit of this, but simply so you have a thorough understanding of what it is that smelters in Australia do.

Tomago have Regain treating arisings, mainly first cut, they have recently had an agreement, as you know with Weston and that is only for second cut. They have exported significant quantities to Befesa, actually exported far more then has been processed and they have some storage on site.

Alcoa Point Henry, we know has on site legacy landfills, prior to their closure they also used Regain to process their material. They have storage on site, at the moment they have storage material that is not dissimilar to what we have stored on site here. Not in terms of volumes but the types of material.

Rod Doherty: It's about the same tonnes though.

Richard Brown: No, they have only got material in the pots.

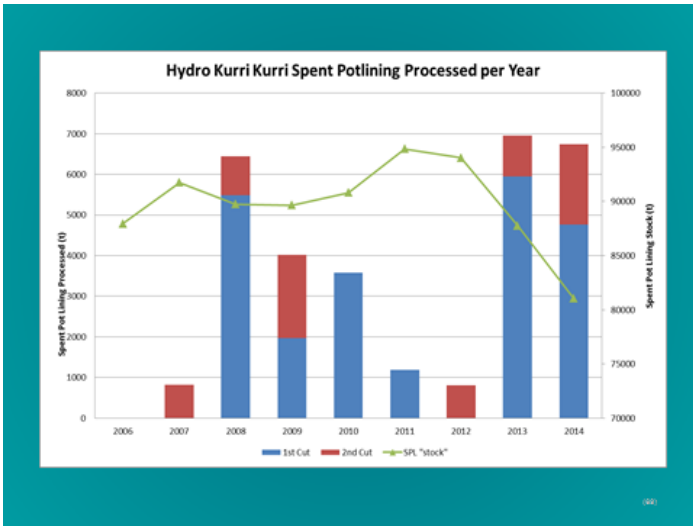
Rod Doherty: No, their production.

Richard Brown: Oh their production. Yes, that's right.

Alcoa Portland, the material has been transported

Notes	Action
from Portland to Point Henry, to be processed at Regain. My guess is that with the closure of the smelter that facility will need to be relocated somehow. I am not sure what Regain's plans are for that. Again they also have limits in terms of how much they can store on site. They are forced to export so they don't actually breach a limit or breach some sort of physical capacity which is why Tomago are exporting to Befesa, because they have sufficient capacity and their offtake of material isn't at a rate that is equivalent to the amount that is being generated. Rio Tinto Bell Bay. They also have onsite legacy landfills containing spent pot lining. But, they send untreated spent pot lining to local cement kiln for processing. That's at about the rate that they are producing it. Similarly, the other RTA [Rio Tinto Australia] smelter in Gladstone, Boyne Smelters. They developed a process called Comptor. Comptor was designed to be integrated with the alumina refinery that's next door. So they produced a liquid, a liquor, that gets consumed into the alumina refinery that no longer happens. So affectively, it's a heat treatment process and that material ends up going to a Cement Australia kiln that is in Gladstone. What's Kurri's' experience? Well we know in terms of storage. But we have processed spent pot lining on site 10 years, there abouts. That's a graph that shows the stocks of spent pot lining over that period of time and the amount of spent pot lining that has been processed, both first and second cut.	

Notes	Action



So you can see a couple of things from that.

The rate of which that material is being processed is highly variable from year to year. Up until the point of time where the smelter was actually closed in 2012, that process wasn't able to keep up with the amount that's been generated. So the amount is rising hence the reason we had one shed, two sheds, three sheds, four. Up to ten sheds. The processing option wasn't able to sufficiently reduce the amount of material we had on site. The drop of course is post closure and at the moment we have, in the order about 80,000 tonnes of material, spent pot lining that we need to find a solution for.

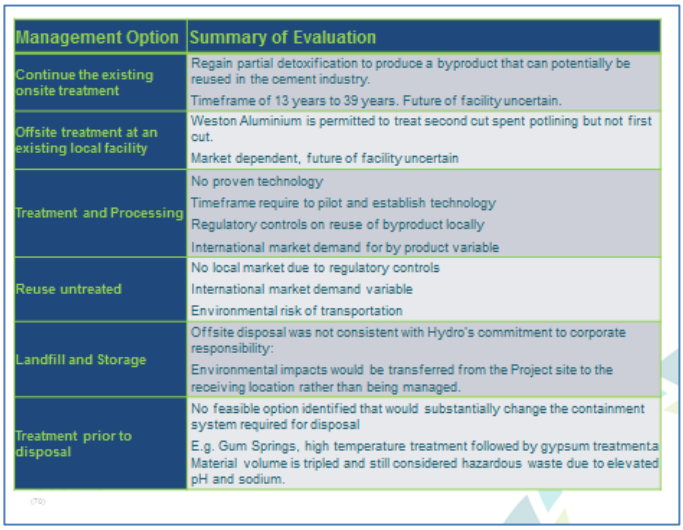
Colin Maybury: Excuse me Richard, the treatment plant was opened [in] December 2010. So it has only been operating for three years.

Richard Brown: The material was actually sent to Point Henry for a while, and the treatment plant on site here doesn't do the thermal treatment. The thermal treatment is at Tomago. So every tonne of material that was processed from Kurri goes to Tomago or Point Henry. Some of that material comes back, and it was used in this plant here which is a fine grinding and batching plant. So some of the products that Regain have, their customers require it to be ground finely so they have a ball mill that they grind it here finely, it gets sent off to its final customers. So the plant here that was opened here in 2010 is the fine grinding and batching plant. I'm not sure exactly when the plant in Tomago was opened, but it was prior to that.

Colin Maybury: 2009.

Notes	Action
Richard Brown: 2009 was it? So thinking about it then, what do we do with the spent pot lining? Our other materials, our capped waste stockpile, our materials that we have, contaminated soils and demolition waste, we concluded that a containment cell was the most reasonable and feasible solution. So applying the same degree of options, or same types of options, what is our thinking around each of those options? So we could continue to use the existing on site treatment. That Regain process. Our experience is that that process is highly variable. If that amount of material was to be processed at about the same rate, then it is going to take a significant period of time to consume the 80,000 tonnes of material. Within that timeframe, we can't be certain that those changes that have led to the variability in the past aren't going to come again. Those issues around the cost of fuels, regulations in different countries, they are always changing, they are always making impacts on various things like this. So, that was an option that we considered. The off-site treatment at an existing facility. Weston aluminium has a licence to process second cut, only second cut so we are talking about only half the material. Again, it is not dissimilar to the Regain situation in that they are going through a process of trying to develop a market for a product. How sustainable is that market? How is that linked to Hydro in terms of sustainability of that market? It is going to take a significant amount of time to work through that. Even if they were able to process it, and stockpile it, the same as Regain, they could process it at an extremely fast rate and stockpile it. If that market doesn't materialise, or they have issues with that market, then who is responsible for that? It is Hydro. They've still got a material which is considered hazardous that we have to deal with. **Toby Thomas:** Again, you are speaking on behalf of Weston Aluminium. **Richard Brown:** I am speaking on behalf of Hydro. **Toby Thomas:** I have got an email from Garbis Simonian here that I will leave out on the table when we have finished here. I think in all fairness you should listen to… **Richard Brown:** We have spoken to Weston about their processing options.	

Notes	Action
Toby Thomas: Ok, when we are finished here I will leave this email out on the table. **Richard Brown:** Is that a different one? **Toby Thomas:** It's a different one yes, it came yesterday.	



Management Option	Summary of Evaluation
Continue the existing onsite treatment	Regain partial detoxification to produce a byproduct that can potentially be reused in the cement industry. Timeframe of 13 years to 39 years. Future of facility uncertain.
Offsite treatment at an existing local facility	Weston Aluminium is permitted to treat second cut spent potlining but not first cut. Market dependent, future of facility uncertain
Treatment and Processing	No proven technology Timeframe require to pilot and establish technology Regulatory controls on reuse of byproduct locally International market demand for by product variable
Reuse untreated	No local market due to regulatory controls International market demand variable Environmental risk of transportation
Landfill and Storage	Offsite disposal was not consistent with Hydro's commitment to corporate responsibility: Environmental impacts would be transferred from the Project site to the receiving location rather than being managed.
Treatment prior to disposal	No feasible option identified that would substantially change the containment system required for disposal E.g. Gum Springs, high temperature treatment followed by gypsum treatment.a Material volume is tripled and still considered hazardous waste due to elevated pH and sodium.

Richard Brown: So treatment and processing. That's the sort of thing we were talking about plasma arcs. New treatments, different treatment options. The likes of Gum Springs, in the US. The first thing is that that technology doesn't exist. There is no plant here. It's not like we have got a plant onsite or somewhere in the country that is actually suitable for doing that. So that technology would have to be built, approved and built, tested and then you would have to do that with the confidence that what they are producing is, you know, what are they actually making out of that process? If as what we have seen, in a lot of instances, in fact most instances, it is actually a product that would have to go into a hazardous waste facility in any case. Reuse untreated? There are smelters in Australia reusing untreated. Now if we were operating the plant today, that's the most sensible outcome that we would be pursuing. Is to find an outlet for it where it goes in its untreated form to an end use. There is not a great amount of value given to the processing of spent pot lining by heating it to 600 degrees then sending it to the same place. So the most sensible solution for an operating smelter, in my opinion, is to find an outlet that takes the material in its raw form. A'la Bell Bay, a'la Norwegians first cut, a'la the solution Hydro has for their smelters in Brazil. Lots of plants like that.	

Notes	Action
Landfill and storage. We looked at that and as we said, if it were permissible. It has the same challenges socially and corporately as the capped waste stockpile. Essentially we are transferring the responsibility of this material onto somebody else. Here is a bucket of money, you go and do with it what you like. That's not Hydro's view. Treatment prior to disposal. We talked a bit about that in the last option. The technologies don't currently exist; they certainly don't exist in this country, where you can treat it to a state where the material can be guaranteed to be inert enough where it's able to be disposed of in an unrestricted way. So that leads us back to the solution that we have talked about previously. What does that conclusion about spent pot lining to do the overall risk that we talked about earlier? We have got a containment cell which is designed to manage materials that have properties that are the same. So the inclusion of 80,000 tonnes of spent pot lining into that solution doesn't actually change the risk profile of the overall picture that we presented earlier. Arguably if it is acceptable to contain to capped waste stockpile and the other materials. Then environmentally there is no additional risk by including the spent pot lining in there. What that does is it gives the site the ability to move forward because it gives it a timeframe that is certain. That means that that can be placed in the cell in conjunction with the overall site remediation and we don't have spent pot lining sitting in sheds or temporarily in the bake furnace for an indefinite period of time. This means that the potential for redevelopment of the site can move forward. I guess if there is any solace to be gained in it again it doesn't mean that we are trying to move the responsibility of this to someone else even if it is at some great cost. Here is a bunch of money, here, find a solution for this material. This containment solution means that the spent pot lining is managed along with the other waste materials and it Hydro's responsibility. So that's how and why we ended up with the remediation solution that we have talked about now for quite a few months.	

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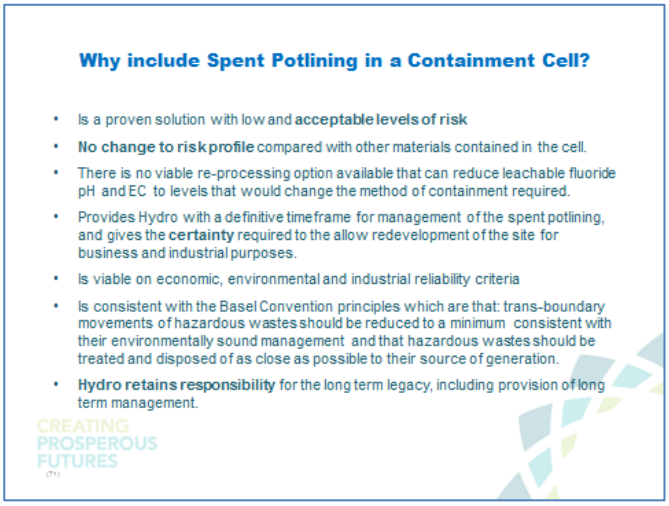

As I said, most of that is a refresher. It's a refresher with all of you being more informed. Through this mechanism and through your own research.

Toby Thomas: Can I read this email out?

Alan Gray: On that there at the end your comment about storing the stuff that's in the shed in there. Still go back to what I said before. I believe it should be processed. But if it was to be stored in that containment cell. Can it be stored in such a way that the technology, rather than put it with everything else, could it be put in so as technology improves, if we want to recover it, we can do it?

Rod Doherty: I thought we covered that last time.

Richard Brown: My understanding is that that is possible. I am not a designer. That is something if we need to we can work with our designers to do that. But yes I guess that is possible.

Michael Ulph: OK, Toby, please go ahead.

Toby Thomas: [Reads out - Email attached].

Michael Ulph: Do you have any response to this email? No? Ok.

Colin Maybury: There was an application sent through to the Federal Department of Environment. Can we have that included in the minutes please?

Richard Brown: It's there Col, I sent it. [Refers to previous slide] there. [see link above on page 8].

Rod Doherty: It's on their website now.

Richard Brown: There, that's the referral that you were talking about.

Notes	Action
Michael Ulph: So that's it there, we will put that in. As I said earlier we will put that in as a separate line so you can click on it and go straight through. **Colin Maybury:** I would suggest everyone read that because there is no mention of spent pot lining or very little. **Toby Thomas:** There is, I actually read through it today I noticed it didn't mention the spent pot lining in the sheds. It spoke about the spent pot lining in the capped stockpile but not in the sheds. Somehow I picked that up when I read it. **Michael Ulph:** Thank you. Any other questions? Alan. **Alan Gray:** Just an update on the hospital, the floods and that closing everything. We know the Metford side didn't get flooded, but nobody could get to it. We have written on that since the last meeting at the Business Chamber we spoke with Scot Macdonald and tabled copies of the Regain stuff as well as our notes on the unsuitability of that site and that there's a suitability of the site here, on Hydro. I'd like to table that to you with all the comments. Also on Tuesday, although that's cancelled the hospital meeting, I presented that copy along with the thumb drive and everything to Eyvonne Patrick's secretary to ask if they could possibly forward them through to Michael DiRienzo [CEO, Hunter New England Local Health District]. We have tried to hit it from both ends. Thanks Michael. **Michael Ulph:** Thank you, I am very conscious of time. It is after eight now. I do appreciate that you have all stayed back for this. Any other questions or comments or general business? **Rod Doherty:** Just a comment on Scot Macdonald. Scot Macdonald isn't a Minister for the Hunter any more he is a Parliamentary Secretary. Somehow he's got to be brought up to speed. He was talking to us at that Chamber dinner that night, he has misinformation. **Michael Ulph:** Thank you, that's good feedback. **Rod Doherty:** The information he was telling us was incorrect. **Michael Ulph:** Right. **Richard Brown:** We'll try and make an appointment to see him. **Rod Doherty:** Well he won't talk to you because of	

Notes	Action
the ICAC stuff and stuff like that. But somehow he needs to get the information. **Michael Ulph:** Alright thank you, anything else around the room, around the table? **Ian Shillington:** A quick one on the waste water treatment plant. Is that above the 1 in 100 [flood level]? **Fiona Robinson:** It would be yes. **Michael Ulph:** The flood level. Yes.	
Next meeting **Michael Ulph:** Shall we have another meeting next month? The 16 July is the Thursday. [Consequently changed to 23 July].	
Meeting close **Michael Ulph:** Thank you very much for attendance. I will close the meeting at 8:05 pm.	

Janita Klein

GHD – Stakeholder Engagement and Social Sustainability

Subject: SPL At HYDRO ALUMINIUM

From: Garbis Simonian [redacted]

To: [redacted]

Date: Wednesday, 17 June 2015, 10:01

Dear Toby
Thank you for sending me a copy of the minutes of the last meeting of The Community Committee. Thank You.
It appears from reading the minutes that Hydro clearly prefers to bury the SPL on Site at Kurri Kurri.This is the least sustainable option. That is why it is banned to landfill SPL in most developed countries in the world ,including Australia since 1992.
Even the best designed Landfills leach eventually.It is only a matter of time. There are respected experts who will verify this position.That is why the EU has banned landfilling of any SPL.
The statement that Weston Aluminium's SPL Process is not sustainable is not true.We process the SPL into a product. This transformation of waste SPL into a product has been confirmed in writing by NSW EPA.We are currently supplying this product regularly to 2 countries, where it is used in industrial processes & turned into products & sold.. Our Process is clearly Sustainable.
If Hydro do not wish to process the SPL in Australia , there is another sustainable option.The SPL can be shipped to a processor in Europe. Tomago & Alcoa have done this in past years. There are at least 2 SPL processors that are sustainable in Europe I am aware of. The biggest is a Spanish company called BEFESA. Tomago & Alcoa Portland have both shipped SPL to this company in the past.
As for our processing capacity, we can increase the tonnage , if we are given a long term processing contract. With a contract we could invest in new machinery & can easily increse our capacity to 3,000 to 4000 tons per month.
We can process the 90,000 tons of SPL in the sheds, about 30,000 tons SPL in pots & the buried mixed waste within 5 years..
I am happy to come & present to the Committee & answer any questions you have
Feel free to pass on this email & my offer to the Committee
Kind Regards
Garbis Simonian
Managing Director
Weston Aluminium Pty Ltd

--

Kind Regards

Garbis Simonian

Managing Director

Weston Aluminium Pty Ltd

Tel ++61 2[redacted]

Fax ++61 2[redacted]

Mob ++61 [redacted]

email [redacted]

NEW LOWER HUNTER REGIONAL RURAL REFERRAL HOSPITAL

(Not a New Replacement Hospital for Maitland)

After the recent Anzac 100 year flooding at Maitland and surrounding area showed up the inaccuracy of the Metford site, as most roads to the site became impassable, some for well over a week, therefore showing the site presently selected by the NSW Government and Hunter New England Health on the PGH site at East Maitland does not meet most of the criteria outlined by HNE health in their community briefings, by Sue Carter in 2012.

Also the new Hospital at Metford is only a replacement hospital for Maitland resulting in the closure of the present Maitland, doing nothing for the people of the Hunter or taking any load of John Hunter

A new Regional Rural Referral Hospital in the Lower Hunter, was to be designed to take some load off John Hunter, by bringing services closer to the people and reducing travel time.

The community meeting held in Maitland on the 25 November 2014 was a farce and nothing but spin by the health bureaucrats. Members of the public were effectively gagged by the facilitator and one wonders if the people of Maitland actually realise that they will effectively have a reduction in services as the proposal of a new hospital at Metford is a replacement hospital and includes the closure of the existing Maitland Public Hospital.

A new Regional Rural Referral Hospital in the Lower Hunter, as outlined by HNE health in their community briefings, by Sue Carter in 2012. was said to be designed to take some load off John Hunter, by bringing services closer to the people and reducing travel for loved ones and would <u>not</u> require the closure of any of the existing Hunter Valley Hospitals

Things that were outlined for considered when locating a New Regional Rural Referral Hospital in the Lower Hunter were;

1. The location should have a flood free location with flood free access,
2. Should have public transport access.
3. Plenty of car parking,
4. Close to Hunter Express Way
5. Site not undermined
6. Availability of Power, Water and Gas
7. Within 40 minutes of Newcastle
8. Newcastle Uni Medical School.
9. Good access to all Hunter Valley Towns, Port Stevens Morisset and Central Coast towns.

10. The New Lower Hunter Regional Rural Referral Hospital should be located at a location so that an Ambulance at the Hexham Bridge or Morisset, in making a call could be directed to John Hunter Hospital or the newly location Hospital.

Some Location that could be looked at;

Branxton, near the new Huntly town development. Expected 20,000 residents over the next twenty years.

Greta, Lochinvar, between Hunter Expressway off ramps at Lovedale road, (old Greta army camp) and has access to the northern railway.
There are expected to be 5,000 new residents over the next couple of years in this area, including new developments to the north and west of Maitland and Lochinvar, towards the Hunter Expressway.

Hydro Smelter buffer zone @ Loxford, This site is located 3km west of the Kurri/ Maitland interchange on Hunter Expressway and at present has a South bound Interchange only at Harts road. This site has only just become available (May 2014) due to the closure of the Smelter. The area has a current bus services, to Newcastle, Morisset and Maitland railway stations by Rover Motors bus service. It also has rail access although at this present time only coal haulage is conducted. Passenger trains have not run since 1960s

POPULATION GROTH EXPECTATION UP UNTILL 2036. (source NSW Planning).

Maitland;- 71% growth 110.000, much of this development is located to the west of Maitland towards the Hunter Expressway

Cessnock ;- 40% growth to 67,500 (this does not include potential to redevelop some of the Hydro site into residential land)

Singleton;- 39% growth to 31,800

LOWER HUNTER REGIONAL REGIONAL RURAL REFERRAL HOSPITAL

The New Lower Hunter Regional Rural Referral Hospital should be located at a location so that an Ambulance at the Hexham Bridge or Morisset, in making a call could be directed to John Hunter Hospital or the newly location Hospital.

Distances from Hexham to;	**John Hunter;**	**17km**	**22min**
	Greta;	40km	39 min
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Distance from Morisset;	John Hunter;	35km	39min
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Distances from John Hunter Hospital to Hydro Smelter buffer zone Loxford; 29km. 26 min

Distances from Metford to Hydro Smelter buffer zone Loxford;
Via Buchanan; 20km 20 min

Hunter Valley Health Services

planning for our future

Newsletter 1 | December 2012

Welcome

Welcome to the first newsletter of the Hunter Valley Health Services Planning Project – designed to keep you informed about aspects of the project and its progress.

The NSW Government has committed $20 million toward planning for improved health services for the people of Maitland and the Hunter Valley and to acquire land for a proposed new hospital.

The Hunter Valley Health Services Planning Project has been formed to deliver on that commitment and is the largest planning exercise undertaken by Hunter New England Health in recent years.

NEXT EDITION:

- *Due out in February 2013*

FOR MORE INFORMATION:

A range of fact sheets and other information is available on our project website at:
www.hnehealth.nsw.gov.au/hunter_valley_health_services

Email:
hne-hvp@hnehealth.nsw.gov.au

Call us: 02 4939 2280

Opportunity knocks

Finding a suitable site for a new hospital in the Maitland region is only one part of the overall project which covers the communities of Maitland, Cessnock and the Coalfields, Dungog, Singleton, Muswellbrook and the Upper Hunter.

Hunter New England Health Director of Planning and Performance Dr Sue Carter said the project will also deliver a clinical services plan for all health services in the Hunter Valley area, and an assessment of existing facilities and their capacity to meet growing demand.

"The increasing pressure on Maitland Hospital due to the area's rapidly growing population is certainly providing an impetus for change, but the project is about more than that," Dr Carter said.

"Maitland Hospital is also the main referral hospital for those rural areas of the Hunter Valley and part of an established network of health services. The needs of those communities must be considered also."

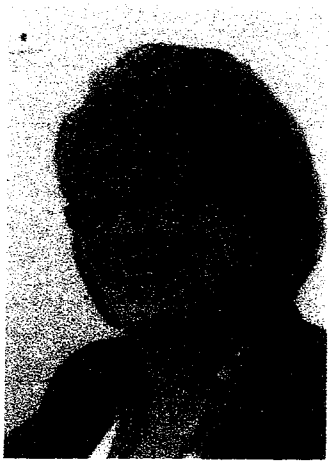
Maitland and parts of the Lower Hunter are among the fastest growing areas in NSW, with a projected population increase of 70,000 people by 2031. In the Upper Hunter, significant mining and economic development is driving population growth.

"We have a rapidly growing population, increasing demand for health services, an ageing population and ageing health infrastructure," Dr Carter said.

"Our region is changing and growing and the health landscape – the health care needed and how we deliver it – is also changing.

"Health services need to change, to adapt and evolve also.

"This is an exciting opportunity to do just that and to plan for improved health services across the broad spectrum of health care – from traditional hospitals



Dr Sue Carter

for the acutely unwell to rehabilitation facilities, day-only and outpatient services, and community health and primary care services."

The clinical services plan will identify the type and range of services required for a new hospital and for the existing network of hospitals and community-based health services across the Hunter Valley.

"It is not about assembling a wish list of health services," she said. "Clinical services planning aims to ensure communities can access quality, safe services. However, it must also demonstrate a critical mass of demand and affordability, and ensure there is an available and sustainable workforce."

Executive project lead Karen Kelly said the plan will build on existing services' strengths and identify opportunities for service improvements to better meet future health needs.

"The recommendations and outcomes of the planning process may require changes to the way we deliver our health services," Ms Kelly said. "It may mean that the function and role of some facilities will change to better meet the emerging needs of our communities and to embrace the opportunities that arise with different models of care."

A final draft plan will be completed by mid-2013.

Hunter Valley Health Services Planning Project
Site Acquisition

Briefing to Government Agencies and Organisations

21 November 2012

Project Description

APP

The NSW Government has committed $20 million toward planning for improved health services for the people of Maitland and the Hunter Valley.

It is an exciting and complex planning project that provides opportunity to plan for and deliver improved health services across the broad spectrum of health care, and covers the local government areas of Maitland, Cessnock, Dungog, Singleton, Muswellbrook & Upper Hunter.

It is likely that the planning process will recommend a reconfiguration of services and include a new Hospital for the Hunter Valley. The new hospital would be a rural referral hospital providing a comprehensive range of acute services and supporting a network of Hunter Valley hospitals

NSW Health Infrastructure

NSW GOVERNMENT Health Hunter New England Local Health District

Minimum criteria

APP

Expressions of interest are sought from land owners in the lower Hunter between Metford and Branxton, who wish to nominate available land that may be a suitable for the new Hospital.

The land must meet the following minimum criteria:

- A usable, appropriate site within the preferred location boundary.
- A site of between approx. 6 and 20 Hectares.
- A site that is not known to be in an area subject to flooding.

NSW Health Infrastructure

NSW Health Hunter New England Local Health District

Submission Details

Expressions of Interest close Friday 25th January 2013 at 17.00.

For further information or to submit an Expression of Interest contact Gillian Geraghty, Project Director from APP Corporation Pty Limited at:

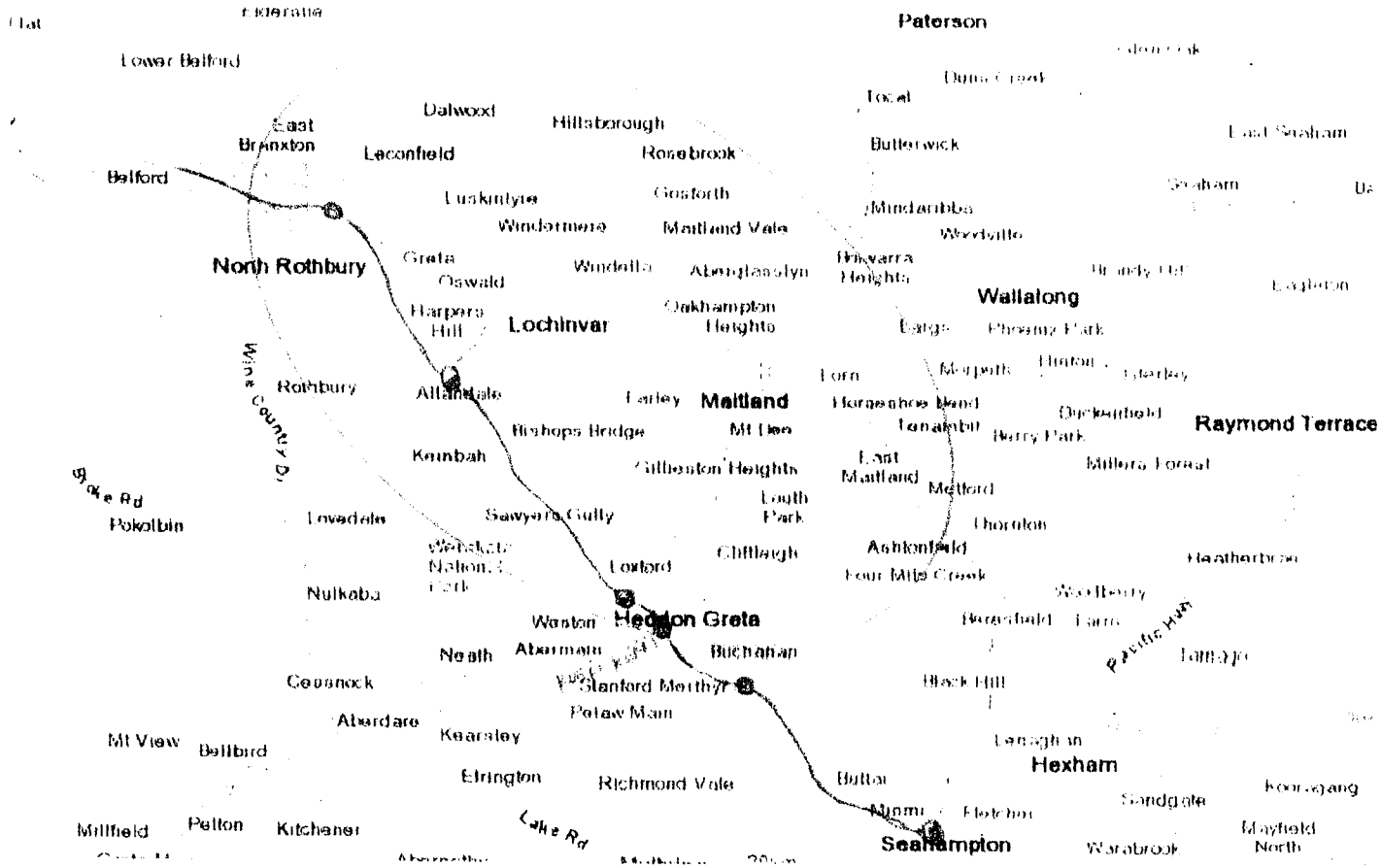
email: Gillian.Geraghty@app.com.au
fax: 02 4927 0930

NSW Health Infrastructure

NSW Health Hunter New England Local Health District

Preferred Location

APP



NSW Health Infrastructure

NSW Health Hunter New England Local Health District

NEW LOWER HUNTER REGIONAL RURAL REFERRAL HOSPITAL

(Not a New Replacement Hospital for Maitland)

Updated June 2015;

The site presently selected by the NSW Government on the PGH site at East Maitland does not meet most of the criteria outlined by HNE health in their community briefings, by Sue Carter in 2012.

The community meeting held in Maitland on the 25 November 2014 was a farce and nothing but spin by the health bureaucrats. Members of the public were effectively gagged by the facilitator and one wonders if the people of Maitland actually realise that they will effectively have a reduction in services as the proposal includes the closure of the existing Maitland Public Hospital.

A new Regional Rural Referral Hospital in the Lower Hunter, should be designed to take some load off John Hunter, by bringing services closer to the people and reducing travel for loved ones.

Things that were outlined for considered when locating a New Regional Rural Referral Hospital in the Lower Hunter were. (Sue Carter briefing in 2012.)

1. The location should have a flood free location with flood free access,
2. Should have public transport access.
3. Plenty of car parking, (free or at a reasonable cost.)
4. Close to Hunter Express Way
5. Site not undermined
6. Availability of Power, Water and Gas
7. Within 40 minutes of Newcastle
8. Newcastle Uni Medical School.
9. Good access to all Hunter Valley Towns, Port Stevens and Central Coast towns.
10. Away from heave rail (coal) corridor and RAAF air space.

One argument put forward by HNEH is that Medical Practitioners would be reluctant to move to the area or travel more than 40 minutes from Newcastle. Let's remind them that some of these people already reside on the Vintage at Pokolbin and will surly move to the new Huntlee township as it progresses, with the Hunter Expressway a major conduit to Newcastle.

LOWER HUNTER REGIONAL RURAL REFERRAL HOSPITAL

The site presently selected by the NSW Government on the PGH site at East Maitland do not meet any of the criteria outlined by HNE health in their community briefings (Dr. Sue Carter)

Things ask to be considered when locating a New Lower Hunter Regional Rural Referral Hospital in the Lower Hunter were.

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10. Is away from heave rail (coal) corridor and RAAF air space.

The Loxford Hydro site for a LOWER HUNTER REGIONAL RURAL REFERRAL HOSPITAL meets all of the above criteria.

The Loxford site was for many years in the State seat of Maitland but is now located in the seat of Cessnock but close to the boundary with Maitland and has flood free access to the northern suburbans of Maitland.

There is a 50h+ site West of the Hunter Expressway on Hydro land next to the Harts Road Interchange that could be used as a Lower Hunter Hospital site, with room for a Private Hospital as an Emergency Service Pre-sink

Need;- North bound ramps at Harts road interchange,
This is needed now, as people from Weston, Abermain area are accessing the Harts road south bound ramp travelling to Kurri Kurri interchange roundabout then back north to the Upper Hunter, and a further need will be because of development at HEZ and Hydro sites.

Large residential developments west of the proposed hospital at Huntlee, Branxton east, Bellbird, Greta and Lochinvar.
Plus the residential developments in the Kurri Kurri, Heddon Greta Cliftleigh area.

LOWER HUNTER REGIONAL REGIONAL RURAL REFERRAL HOSPITAL

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