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

Project	Hydro Kurri Kurri site redevelopment project	From	Bridie Halse
Subject	Community Reference Group Meeting	Tel	1800 066 243
Venue/Date/Time	Thursday 15 June 2017 Hydro Aluminium Kurri Kurri 6.00pm – 7:30pm	Job No	21/23175
Copies to	All committee members		
Attendees	Mr Andrew Walker – Hydro Kurri Kurri Project Manager Mr Gareth Curtis - Director of Planning and Environment, Cessnock City Council Clr Darrin Gray – Cessnock City Council Mrs Kerry Hallett – Hunter BEC Mr Kerry McNaughton – Environmental Officer, Hydro Kurri Kurri Mr Ian Shillington – Manager Urban Growth, Maitland City Council Mr Alan Gray – Community representative Mr Michael Ulph – CRG Chair, GHD Ms Bridie Halse – Minutes, GHD		
Guests/observers	Mr David Barrett - Containment Cell Designer - GHD Central Coast		
Apologies	Clr Arch Humphery – Maitland City Council Mr Toby Thomas – Community representative Ms Debra Ford - Community representative Mr Richard Brown – Managing Director, Hydro Kurri Kurri Mr Rod Doherty – Kurri Kurri Business Chamber		
Not present	Mr Bill Metcalfe – Community representative Mr Brad Wood – Community representative		

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1 Welcome and Acknowledgement of Country Meeting commenced at 6:00 pm **Michael Ulph (Chair)** Acknowledgement of country.	

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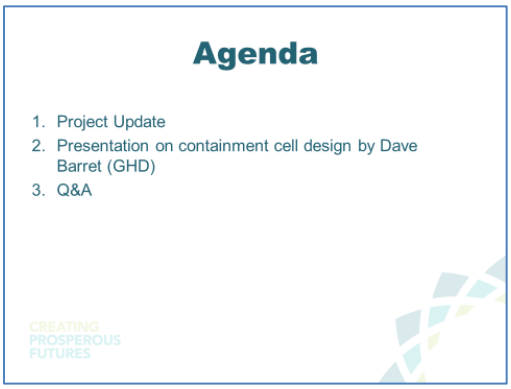
2 Meeting agenda



- Welcome and meeting opening
- Apologies
- Acceptance of minutes from the last meeting
- Project update
- Containment cell design
- CRG questions and answers / All other business
- CRG membership & Terms of Reference review
- Next meeting / Meeting close

3 Welcome and meeting opening

Michael Ulph welcomes the committee and notes apologies.

Introduction of David Barrett from the Tuggerah office of GHD, who will be talking about containment cell design. Introduction of Bridie Halse from GHD.

Around the room introductions.

Provided draft guidelines in relation to pecuniary interest and discussed the need for people to indicate if they have a pecuniary interest (e.g. engaged to be there). (appended to meeting minutes).

Michael Ulph: Is anyone in any doubt about having a conflict of interest in a meeting such as this and what it means? I will ask people to acknowledge if they have a conflict at all.

I will declare a conflict, my employer is paying for my attendance here tonight therefore I have an interest in being here. Would anybody else like to declare interest?

Michael Ulph and Bridie Halse as Hydro contracted staff declared interest.

Hydro staff as representatives of the owners of the land declared an interest.

Notes	Action
4 Last meeting minutes Michael Ulph requested a motion that the minutes be accepted as a true and correct record of the last meeting. Moved: Darrin Gray Seconded: Kerry Hallett **Michael Ulph**: Were there any actions from the last meeting? I will note that there was mention about sending out more information about the project. The latest newsletter, which we have been preparing, is completed and will be emailed out and posted out to those who we do not have an email address for. If there is any questions about this, please feel free to contact us. [Copies provided to CRG members]	

5 Project update

Andrew Walker: Preparation for demolition has begun. The demolition contractor has mobilised to the site and demolition will be ready to start very soon.

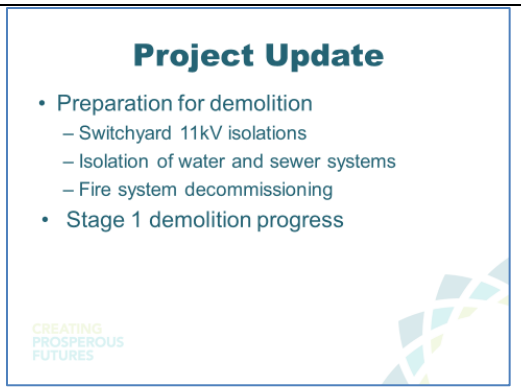
We have been working on completing isolations for the 11 KV cables around site, which leave the switchyard and distribute around the site. We have been working on water and sewer systems, isolating those and decommissioning the fire systems of buildings that are earmarked for demolition. We have four service transformers in the switchyard. Although the cables have been isolated, the switchyard is still energised.

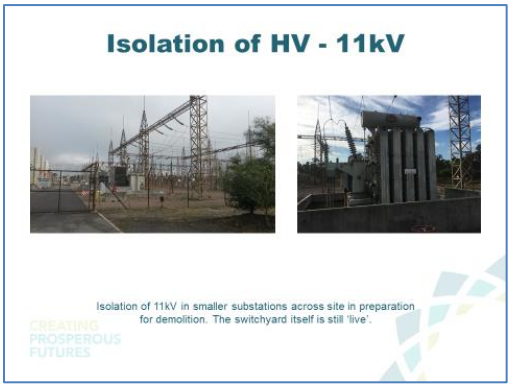
We are also isolating low voltage cables. Low voltage control cables including alarm cables, sirens and emergency stops go out into the potlines and connect through to the tunnel boards in the main control room for the switchyard called 29 A/C switch room. We have been working in the tunnel boards isolating 415 and 240 V cables. This work is nearly complete.

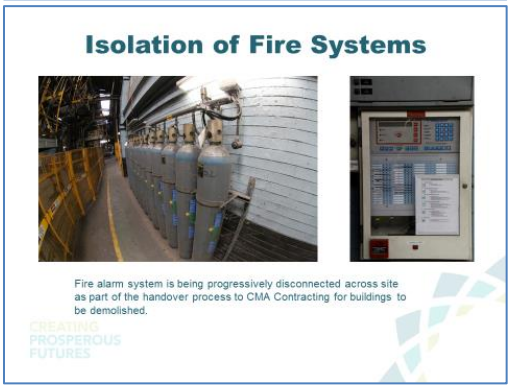
We are in a handover process to CMA the demolition contractor, and as we sign off that the power, natural gas and water have been isolated. Any hazardous material like asbestos is noted in the handover process. Fire systems have been isolated progressively. Inergen and other inert gases that are used for fire suppression are being decommissioned and transported off site.

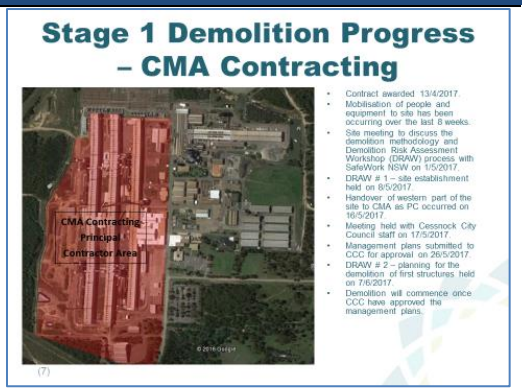
Half of the site is now handed over to CMA contracting. The cast house, the three potlines and the bath crushing plant. The carbon plant, central workshops, SPL sheds and front office area is still under Hydro control. CMA are now the principal contractor for their area. A contract was awarded to CMA on the 13th of April, they presented at the last CRG meeting, over that period they've been mobilising people and equipment to site. They've got three large excavators here ready to start demolition.

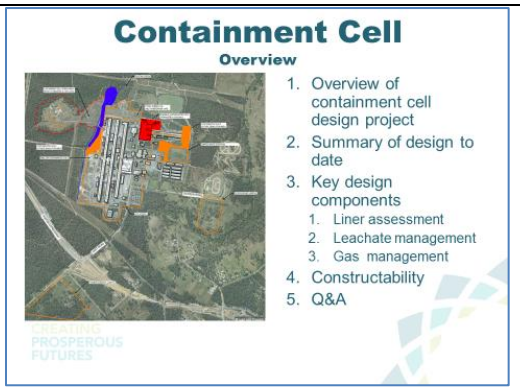
A site meeting was held with Safework NSW to go through the demolition methodology, explaining the DRAW process, which stands for 'demolition risk assessment workshop'. WorkCover were happy with this process. The first DRAW was on site establishment on the 8th of May. The handover occurred on the 16th of May, and on the 17th of May we met with Cessnock City Council staff to discuss management plans and CMA made a presentation outlining demolition methodology. Management plans were submitted to the council on the 26th of May, with a

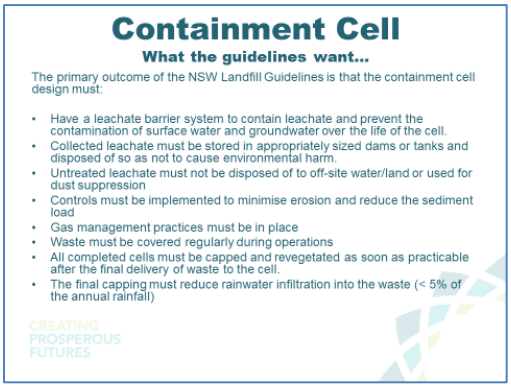






Notes	Action
two to three-week turn-around, we are hoping that these will be approved in the next week. The second DRAW was held to plan the methodology of the demolition of the first structures. Demolition is planned to commence in the next couple of weeks. **Michael Ulph:** Are there any questions around Andrew's presentation? **Alan Gray:** Lime will be put in the septic tanks, are these hooked up to the sewerage? **Andrew Walker:** Yes it is. There is a pumping station near the central workshops. The septic tanks around the potlines on CMA's site are being shut down. Small shallow tanks that are less than 1.5 m deep are being removed, which would have to be removed as part of Stage 2 Demolition. Standard procedure is to pump them out, coat them with lime, then smash them in and fill them with earth and clean soil, which has been done. This will make it safe for a machine to drive over it. This concrete will be removed later as a part of the demolition process. **Alan Gray**: I'm more interested in whether other companies that come on site will have access to the sewerage. **Andrew Walker:** We are looking to keep it. The sewer line runs along the main road and off to a 45-degree angle through the bush and under the expressway into the bush to the sewerage treatment works on the other side of the expressway.	





6 Containment cell design

David Barrett: First, I will run through an overview of the containment cell design. I will give you a summary of the design to date and key parameters which we want to achieve in the design. The key components to discuss tonight are the life of liner, the leachate gas and then we'll move onto constructability. Questions are invited throughout the presentation.

We are planning to build a containment cell to hold the contents of the capped waste stockpile and various waste items from the demolition. When we began, we looked at the NSW Guidelines for landfill, which had only been re-issued in 2016. The basis of what they are looking for is:

- a leachate barrier system to prevent contamination to surface water and groundwater;
- to be able to collect the leachate and store it on site in a dam structure reducing any in-cell storage;
- to ensure untreated leachate could not be disposed of offsite or on the land, including use for dust suppression;
- controls for surface water between swales and dams preventing sediment laden water discharge.
- gas management practices to be put in place are appropriate to the waste generated.
- waste to be covered regularly, during daily operations. In a putrescible landfill you would usually have a 100 mm of clean fill placed over to stop waste being blown around etc. On a site like this we would probably use tarp controls which makes it easier for the operator to get it on and off without using too much clean fill.

Michael Ulph: So do "daily operations" refer to the construction of the cell?

David Barrett: This contract will require a contractor to build, fill, cap and maintain the cell for a period of 52 weeks. The operations phase in this instance is during the deposition of waste within the cell.

- All cells to be capped and revegetated as soon as possible
- The final capping to account for less than 5% ingress of the annual [rainfall].

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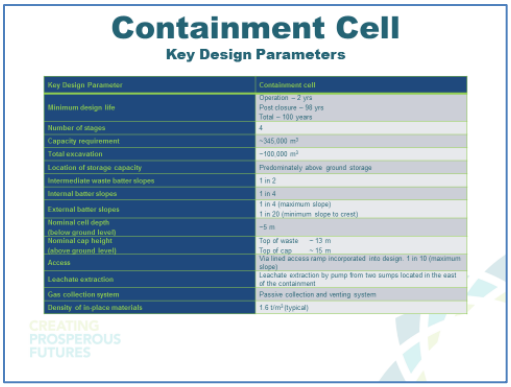
While this is within the guidelines, we are aiming to design a “dry tomb”. We have used similar concepts in Queensland, where we extract the leachate during deposition phase of the waste, install a cap that will prevent ingress of water to achieve a dry tomb. The reduction of leachate production assists in reducing degradation on the liner systems and reduces future gas production. Granted that on this site there isn’t really any gas production, very little.



These are the key design parameters:

A minimum design life of about 100 years, which we weren’t really concerned about. We wanted four stages of construction to give one large bowl, broken into quarters so that we could stage the capping.

Darrin Gray: Minimum design life is 100 years but the cell will be managed in perpetuity, shouldn’t the life of the cell be indefinite?

David Barrett: Yes. The life of the liner will be discussed about halfway through the presentation, but consider that the liner is one aspect of the system. The system is in perpetuity. I’ll demonstrate this and ask as many questions as you want.

I’ll also give a ‘show and tell’ of various liner types, what we’ve tested, and so on.

There will be four stages, capacity requirement is for just under 350,000 cubic metres, expected to excavate about 100,000 cubic metres out of the area, which will be used in the infrastructure itself.

Michael Ulph: Just for your benefit David, most people here, would understand where the clay borrow pit is.

David skips forward a slide to a layout of the site, describes the area, proposed access tracks and proposed cell area.

David Barrett: The clay burrow pit is located on the western side of the site. New culverts and a new bridge will create access to what I have been referring to as the “cell”, or the clay borrow pit.

- Internal batter slopes, we have gone with one in four - a very low gradient. Everything we have put into the design has been an enhancement of what the guidelines require. This is what we call a turkey’s nest, half of it is below ground and half of it is above ground, in this case the majority of it is above ground. This is due to the

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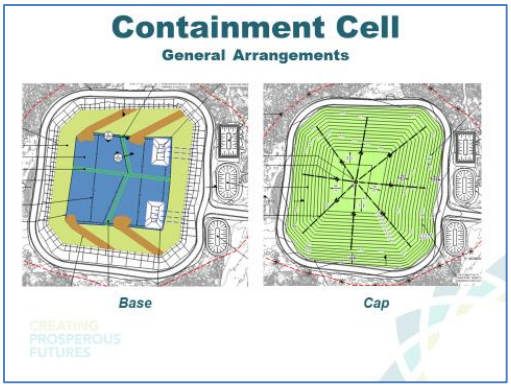
existing gradient of the clay borrow pit, we're going roughly 5 metres below ground level and going nominally around 13-15 metres above ground level.

- Purpose built access ramps within four locations around the cell, it will be utilised for access purposes, and during deposition it will allow trucks to go down one ramp and up another for health and safety purposes.
- Leachate is to be extracted by two sumps on the site,
- A passive collection and venting system.
- We have assumed density of 1.6 to give us our 345,000 cubic metres.

Gareth Curtis: I'm just trying to work out the visual look of the site. How high are the current stacks?
Andrew Walker: The highest stack is 137 m, so the cell will be 10% of the height of the current Line 1 stack.

David Barrett: In the clay borrow pit, there's a tree line all around the current clay borrow pit. The cell will be below the tree line. You can't visually see it from the Hunter Expressway based on the data we have.
Gareth Curtis: I'm assuming all that is in the Major Project Application?
Andrew Walker: Yes, in the visual amenity section of the EIS.

David explains the layout of the cell and access tracks using the slide.



We've split the cell up into four areas because once we place waste in one location, as soon as rain hits it, that rain is classed as leachate and has to be treated as such. We will commence placement in one area, and others areas remain 'clean' so it is classed as surface water i.e. could be directed to the ponds or release directly it into the creek, depending on the load hitting the creek at the time. This will cut down leachate generation, which is standard practice.

David points to bunds on slide.

These bunds are known as rain flaps, keeping clean surface water on one side, and leachate on the other.

Darrin Gray: How do the swales work?

David Barrett: At the top level, excluding the stone and geotextiles, the lining system will have a two millimetre thick, high density polyethylene [shows sample]. We'll build a bund

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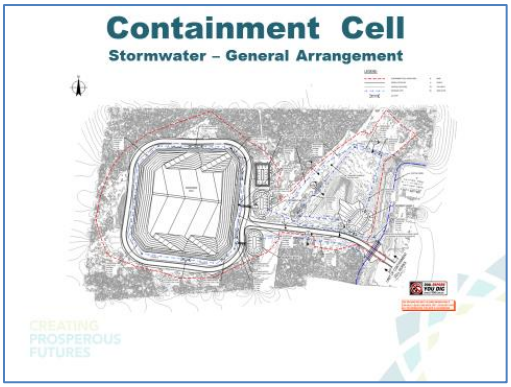
that will be lined with the same lining system used everywhere else on the site. That will basically maintain clean surface water on one side, separated from the waste. Before waste is moved into the cell, any water present is pumped out prior to placing the the waste. If the bunds didn't exist, the amount of leachate in the cell would double. Leachate should be minimised. Waste shouldn't be deposited when it is expected to rain. The last thing you want is to start in a new cell and have an April storm hit. You'd probably delay going into it.

On the other side is the cap, the cap system is simple for easy maintenance, with a low gradient running off and a much flatter area on top. The black lines (*on slide)* are the spiders, which are the lateral lines for gas extraction points. These will facilitate the gas going to one central location for extraction. These ones here are below the cap, into the waste and they facilitate getting the gas to the surface.

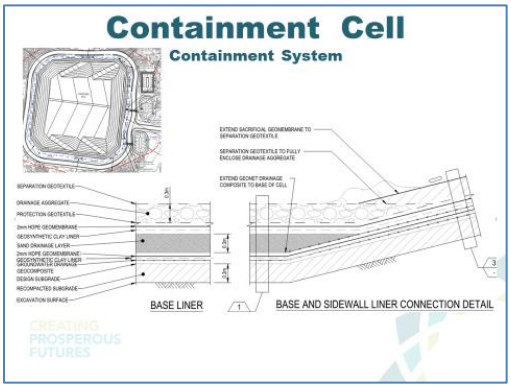
In relation to stormwater, when waste deposition begins, we'll come across Unnamed Creek, into the cell, down through the access ramps.



David points to sediment ponds on slide.

These are sediment ponds, they're going to be utilised for stormwater control and to separate out sediment laden water. There are drains going around the cell to control water around the cell and into a sediment pond, prior to discharge to the creek. The northern pond is a leachate pond for buffer storage, which we will cover off at the back end. Around the perimeter of the site, there is standard surface water controls, which basically separates the clean from the dirty, and prevents water getting into the site and becoming leachate.

David points at slide, explains the containment system, and passes around samples of the liner.



The HDPE liners are the products that have been tested.

Below the landfill is clay rich, we will take about 300 mm of that and condition it, re-compact it down to build a good foundation for the cell. The next step is to put a groundwater drainage geocomposite in. There is no groundwater that we are worried about, but this will prevent any possible issues in the future.

We'll be putting in something very similar to these products, [David hands out geocomposite samples], which facilitate water flow. There are different types.

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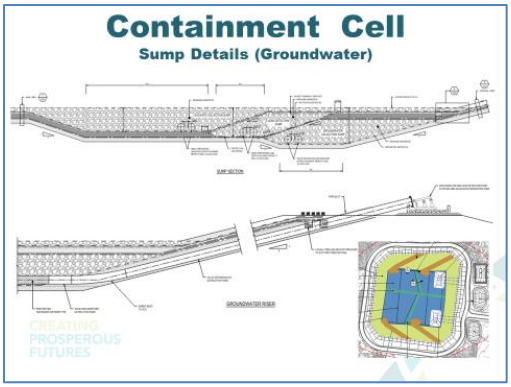
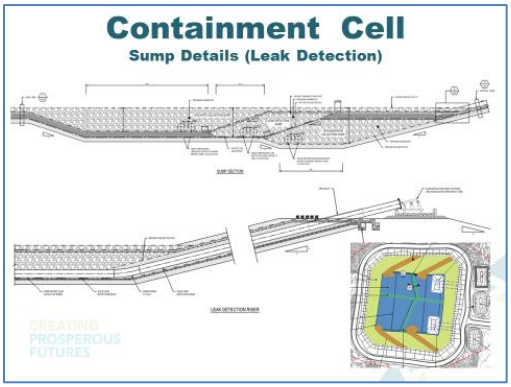
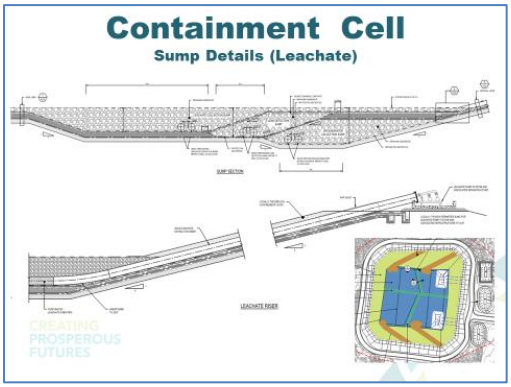
Above the geocomposite (GC), we will be putting in geosynthetic clay liner, which is similar to an underlay for carpet, and needle punched with bentonite. Once bentonite touches the soil, it will pull moisture out of it. The product will swell up, and is self-healing, so if a slight hole appears, it will repair itself. After this, it becomes impermeable in the region of one by ten to the power of minus 11. This is two magnitudes greater than the guidelines for a clay barrier. Above that, a 2 mm HDPE liner will be put in, this is known as the secondary liner, it is not your containment system, it is just a contingency liner. Above that is a sand drainage layer, then another GCL layer, so another layer of ten to the power of minus 11. On top of this to form intimate contact there will be another 2mm HDPE liner. Above that is more geotextile. This is a protection geotextile as it protects HDPE from damage from the 300 mm of stone that is placed on top of it. This stone facilitates conveyance of leachate to the sump for extraction. On top of that is a separation geotextile, which is to prevent fines coming into the stone and blocking it up. A very similar design goes up the side slopes. The only difference in the side slopes is not installing the sand drainage layer. However we are bringing in a drainage geocomposite, similar to the ones that are on the site, to facilitate getting any liquid into the sand layer below. Each side of the site will be drained from their corresponding sump. Each sump has three parts, three extraction points, all to the top of the slope. Each pipe will extract a different product, when and if needed. What we have in the plan view is three sumps - one is free to bleed out into the environment and into the groundwater, as it is the groundwater sump, used to redirect any groundwater or surface water that has hit the liner, so we don't end up with pressure on the liner, or a floating liner. There is another sump in the sand layer, which is known as the leak detection sump. The third sump is the leachate sump. Looking at the groundwater sump and layer, a pipe system will be installed to extract it if need be. This is a precautionary inclusion in case it is needed in the future, but we don't expect to be using it at all. The leak detection sump will extract any leaks that go through the primary liner into the sand layer, so they can be extracted and either put back into the cell, put into the buffer pond or taken off site by a third party.	  

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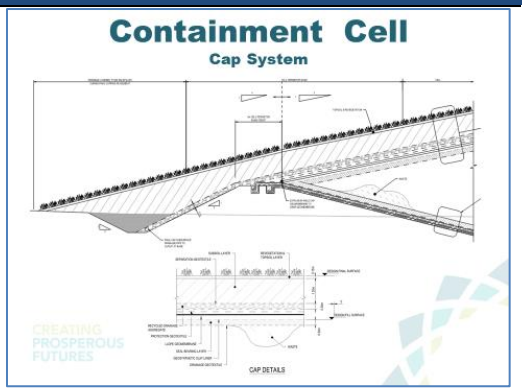
Finally, the leachate riser will allow for extraction to the leachate pond or extraction to a third party.

Each sump is independent and in no way linked.

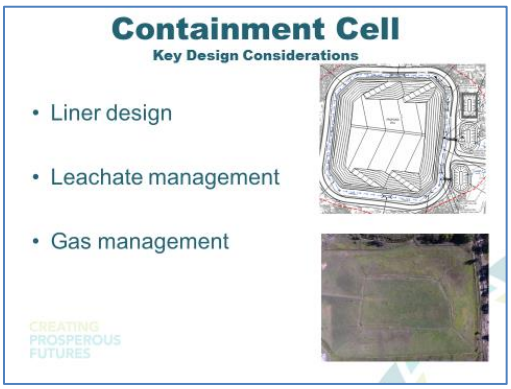
On the top is the cap system. This is double what is normally required. This is to maintain the "dry tomb", which means no leachate. We extract it during the construction phase, we extract it during the deposition of waste phase, we extract it for a period of time after we have finished the construction of the cap, and eventually it is just dry. We can dip the pipes to make sure. The cap system placed on the waste product will comprise a foundation layer (or a seal bearing layer). The clay from existing capped waste stockpile will hopefully be used in this layer, which is achieving 1 x 10^{-9} and 1x 10^{-10} at the moment, on top of that, a linear low-density polyethylene. This is about one mm of what you have there, so that it is much more flexible, giving the same permeability, but a higher flexibility as it will be used on the cap. Above that, there is a drainage layer for any surface water, and then a standard cap system which is sub-soils, soils and vegetation.



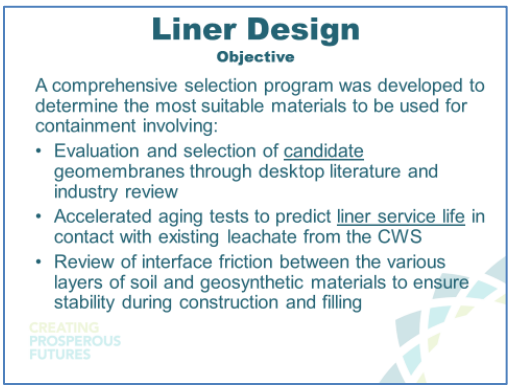
Michael and David discuss the difference in normal municipal waste systems and this "dry tomb" system.

David Barrett: The HDPE and LLDPE are then welded and sealed, sealing the extracted product inside. The only exit point is the one vent pipe to facilitate any gas that may come out.

The key design considerations are:



- Liner design. Standard in putrescible because there is so much of it, we know its proprietary and that it will withstand a lot. There was no dedicated site specific testing, so we designed the liner specific to be used on this site. We took the leachate in the current capped waste stockpile, sent them to Excelplas laboratories in Melbourne. We wanted to prove the 100 year life span of the liner material through scientific testing.
- Leachate management. The options considered were whether it will be treated on site by setting up a treatment plant, whether it will be pumped directly into the sewer system under a trade waste agreement, whether it is was treated on site and irrigated, or whether it will be taken off site by a third party. We used a multi criteria analysis to investigate all these options.



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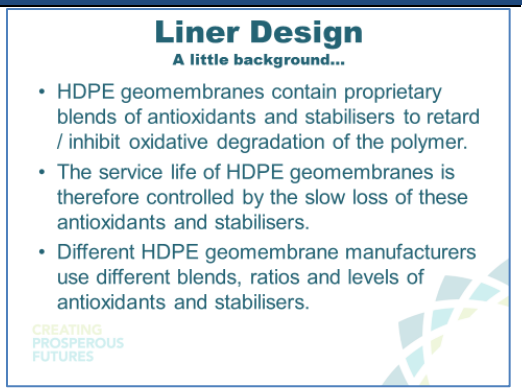
- Gas management. This consideration is unusual because we aren't generating gas. The stockpile as it stands has been monitored on a monthly basis and there is little or no flow of gas. While the capped waste stockpile has multiple exit points, we're going to connect exit points all underground and just have one vent pipe. This exit point or vent would be built in an area where we could increase the cap depth, and small trees could be planted around it.

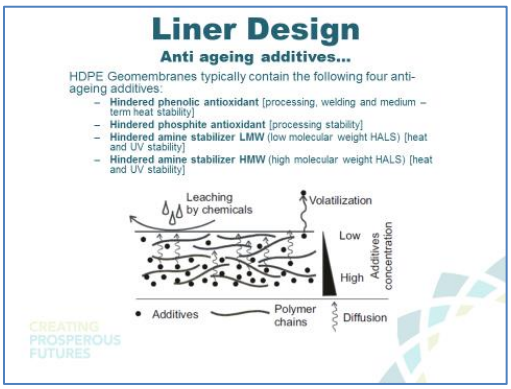
The liner design went through a comprehensive selection process, where candidate liner types were assessed. These were listed based on our experience, industry experience and talking to the manufacturers around the world. We took these liner types and undertook accelerated aging tests to predict the liner life in a leachate that was generated in the capped waste stockpile on this site.

HDPE (high density polyethylene) geomembranes contain their own recipe [combination of elements], and each manufacturer has their own unique combination. It has antioxidants and stabilisers. Phenolic and phosphite antioxidants are added to inhibit the oxidative degradation of a polymer during the short term construction of the product (extrusion, welding etc). The stabilisers (the low and high HALS) are to help in the long term if there was expected to be heat on the site or exposure to UV .

When you have a two-millimetre piece of HDPE plastic, it is made up of polymer chains. Embedded in that are additives. When water and oxygen start to leach and deplete these additives, anything placed on top or in contact with the plastic including sand or geotextiles slows the depletion process. It is another protection layer. When we are testing we use the absolute worst case scenario. We drop one piece of plastic, completely immersed in liquid, we are increasing the temperature up to 55 – 95 degrees to accelerate the degradation process, it's happening on two sides of the liner, but in this cell it can only happen on one side.

Three candidate liners were evaluated. We initially started with about ten but we went down to three. There was two-millimetre high performance HDPE, a two-millimetre BPEM, and a two millimetre premium high-density series. We cut them into dogbone shapes and they are hung into a system, weighted in the bottom to keep them nice and still in the site-specific leachate. This testing was carried out over six months. The





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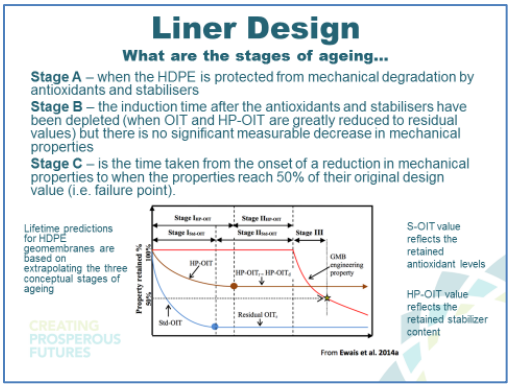
manufacturer tells us how long it will last. We initially carry out testing to verify that the manufacturer was telling the truth. The manufacturer had actually underestimated the product.

We immersed it in a liquid at a few different temperatures, carried the testing out after three months and six months. These results were extrapolated to come up with a service life.

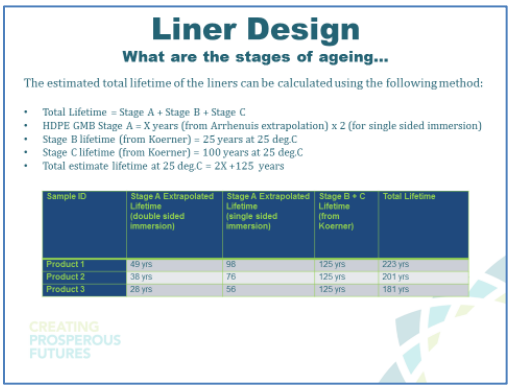
There are three stages to the aging process. A, B and C. Stage A is the antioxidants and stabilisers. They deplete the quickest and are there during the extrusion, manufacturing and installation processes. They are not a long-term requirement. Stage B. is the induction time after the antioxidants and stabilisers have been depleted. There is still no depletion of the mechanical properties of the liner, they are still doing what they were designed to do. Stage C is the final stage where the mechanical properties start dropping. Once they have dropped by 50%, that's the shut off period.

We test for S-OIT and HP-OIT to look to determine the time it takes for the liner to age. S-OIT reflects the antioxidant levels in the short term, and HP-OIT tests for the stabilisers, which is in the long term. We take the three stages and we can estimate the life of the liner.



In our [chosen] product, stage A is double due to the exposure of only one side of the liner, stage B and C is based on years of research. This gives us the overall life- stage B is 25 years, stage C is 100 years, and stage A is 49, 38 and 28 years based on the product tested. Due to the many layers, these numbers are increased still. The life of the liners were between 181 and 223 years. This should be taken into account that this liner is only one part of the whole product.

David briefly lists the layers previously stated to explain how the liners life is extended by them.



We only test the top liner.

Darrin Gray: So this will degrade in 300 or 400 years?

David Barrett: No it will reduce down to its mechanical properties and sit there. It rarely ever goes below that. What is causing the oxidation is leachate. Because we have a dry tomb, there won't be contact with leachate or oxygen and water.

Leachate management was the next key consideration, down to what makes up the leachate. We sampled the stockpile, which is what will be going into the cell. We carried out a full suite of

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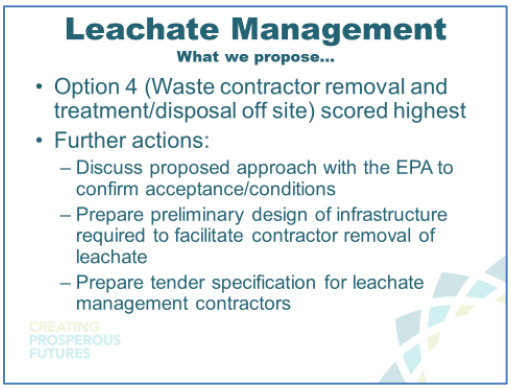
analysis in the laboratory- every component was looked at to see if there was any concerning elements. Option one was to treat on site and use for irrigation and dust purposes. We looked at everything in the treatment option including reverse osmosis, membranes etc. the second option was to treat on site and then discharge into the sewer system. At this stage you put it straight into the system and pay for the wastewater treatment plant to take it. Option three is to store and mechanically evaporate in a pond. This is where you force the liquid out through a very small valve and it evaporates immediately. This is very successful at a site north of here. Option four is the use of a third party, where a third party comes onto site and tankers it off site. This wouldn't normally be the most attractive option however you wouldn't be trying to create a dry tomb or close it as rapidly as this site is trying to do.



Within leachate management we also considered

- health and safety risk,
- ability to meet water quality,
- environmental impact and risk associated with it,
- total cost,
- cost sensitivity based on total leachate volume, i.e. the rainfall events, how long we'll be operating the cell, how long until we can cap certain sections.
- Social e.g. noise and odour, and;
- the people required to run it. If there is a highly technical operation on site, then we need a highly technical person to run it properly.

What we proposed was option four - the third party. Mainly because we are going to close the site so quickly, this is the most viable option. We looked at three contractors, got the leachate delivered to them, they analysed the leachate and see no issue with the treatment they proposed. Some of the are going to be doing trade waste, some will do ocean outfall. We need to discuss the approach with the EPA, prepare a preliminary design for the infrastructure, option four requires the least amount of infrastructure. It will require things like a concrete pad beside the leachate pond for the truck to back up on. The concrete pad will be bunded back to the pond in the case of any leakages. The pumping systems aren't going to be permanent due to the dry tomb. Everything to do with leachate

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will be temporary. Two concrete pads will be constructed at the top of the pad just below the sumps. The leachate pond won't be needed at the end of the project as there will only be small amounts of leachate left in the cell. Tender specification will be dictating the terms to which the third party is chosen.

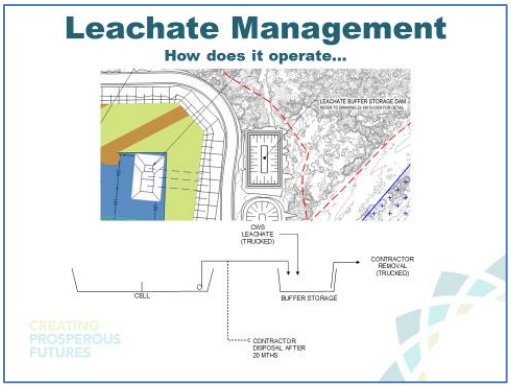
How it operates is very simple. We take the leachate form the sump, we have in cell storage, containment outside for storage, the contractor will reverse up here or here (*points to buffer storage diagram)* to take it out. After about 20 months, we will decommission the leachate pond and store the liner, into the cell and start extracting the remaining leachate directly from the cells. At that stage we've achieved the dry tomb. This should occur around 24 months. If we double that, i.e. 44 months, which is less than 10% of the stage A time period.

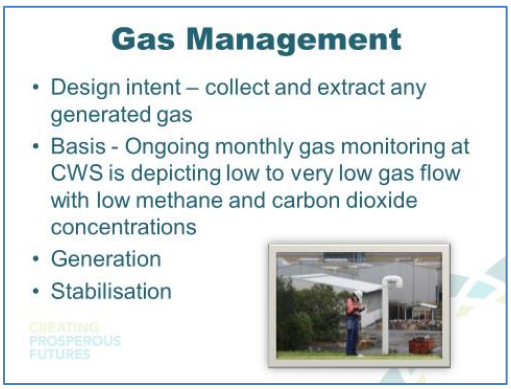
The other item is gas management. The design intent is to collect and extract any gas that is generated. The basis comes from what's happening on site, as we have been monitoring it every month. We have looked at the flow and the composition, and these have helped us determine whether we need to suck it out i.e. put it under negative pressure to encourage it to come out, whether we would be required to flare it or put it into an engine. In this case, there is low volumes and quantities of methane and carbon doxide of no value. What will happen is we'll increase the production of gas in the excavation of cap waste stock during the transportation of the cap waste stock into the cell. This will happen, as we will be exposing it to air. Stabilisation will occur within 18-24 months, bringing it back to the levels it is now, which is little or none. We'll install eight pipes under the cap, even though there is only one exit as gas will find the easiest path to flow into. Rather than putting in nothing, the gas will find the cap and the design will facilitate it.

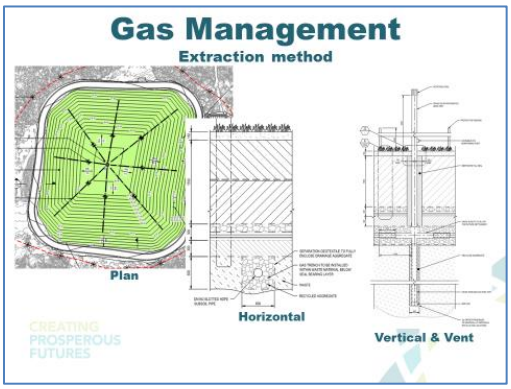
In relation to the extraction method, these black lines (*points to slide)* will be below the cap surface. They are gas trenches made of aggregate or crushed concrete to facilitate movement. Inside it, 160 perforated pipes to facilitate the gas.

David points at vertical and vent diagram- these here can be sealed with the LLDPE within the cap system. They can be built above, or below, right underneath the waste. LLDPE is used in putrescible landfill as there is expected to be movement within the cell and it allows for this.

Darrin Gray: will there be any waste settlement on this site?
David Barrett: the only settlement on this site that will occur is







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during the construction phase as we will be compacting it into place. There will be no significant long term settlement. We won't get the long term settlement as seen in putrescible landfills as there are no organics i.e. nothing is degrading.

Darrin Gray: Will the pipes and other materials from the demolition waste have the potential to settle?
David Barrett: Everything will be compacted during the deposition process. The contractors on site will be concerned about getting as much per cubic metre out of the cell design as they can, so they will be making sure it is compacted fully.

David reiterates that the waste won't degrade, and will not cause settlement issues for this reason.

Andrew Walker: As we are filling the cell, we will be driving over the waste compacting it and spreading it. This will be done in such a way that doesn't damage the liner material. By the time the cell is capped, the waste will be fairly well compacted.

David Barrett: There will be a landfill roller going over the waste in a region of about maybe three and a half metres of waste in the bottom, once that is placed and compacted, you can drive straight over it. This first lift takes a bit of time and dedication, and include using contaminated soils. Depth of a layer of waste is usually nominally three metres, with construction and demolition it gets a little higher and with putrescible waste, it gets a little lower. We place those lifts as we go. The contractor will do it properly to prevent leachate issues, otherwise it will slow their work down. The lifts are placed properly so that voids don't occur and this will actually save time in the long run.

Darrin Gray: Will there be anyone on site to conduct independent monitoring?

Andrew Walker: We're currently in discussions with the EPA, this has not been approved yet but we have meetings coming up to discuss our proposal. Once we get through the approval of the EIS, we start the process of actually talking to the EPA's technical people, who specialise in designs for landfill and containment cells.

David Barrett: The EPA don't rely just on the contractor or the client to deliver a cell. They rely on a construction quality assurance engineer. Materials come with their own materials quality assurance, which is then tested in a laboratory to make sure this is accurate. Everything gets tested to ensure their quality.

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David hands out "wedge welds" and "extrusion" samples.

Wedge welds are two pieces that have been welded with an air pocket between them. The seam was proven stronger than the parent material itself. This air pocket is tested under pressure to confirm the quality of the seam. This is done by blocking the seam at one end and putting an air needle at the other end and testing the bar pressure. The other method of welding is known as extrusion. This is adding a molten product to join two pieces of liner together. It is tested through a vacuum process, by covering it with a soapy water, subjecting it to vacuum pressure and watching for any escaping air bubbles. The extrusion weld is more expensive than the wedge weld for a contractor to place in, so the ideal system is for everything to get wedge welded, which we want. T joints where liners meet are all extruded. Every 150 m of continuous seam, or part thereof, we cut it out and send it to a laboratory for it to be tested. They get repaired with a new patch with an extrusion weld around it. If the installer is not going to use the vacuum box system, they would install copper wire down the centre and carry out a spark test, which is a brush with electricity in it that you brush along, if it sparks, there is a failure. This is very expensive and time consuming. The wedge welders are tested every four hours or whenever the temperature changes by five degrees, to make sure that the speed of the wedge welder is not too slow or too fast. Too slow, there is too much heat and stage A happens quicker, too fast and it won't adhere. Every single seam is signed off by a CQA engineer. On top of that, the lining product gets sent off to a laboratory to verify that each batch we get sent is exactly what we've been issued. The same rule applies for the GCL and geotextiles. These are glued / stitched together. The drainage geocomposite won't be seamed together because it is just for water flow so it doesn't matter as much. They're also overlapped by about 300 mm. The CQA engineer also looks at the width.

Each batch is monitored to verify its quality. From a batch of liner, 50 rolls out of 100 may get used.

Ian Shillington: So this is as you're constructing the cell, what about throughout the life of it?

Andrew Walker: we have to agree a long-term management plan. We've put forward a proposal which is being discussed with the department of planning and the EPA. The testing we've done on the liner is assuming its in constant contact with the leachate, but as there is two layers of HDPE, two layers of GCL,

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its on a site where the groundwater is five or 10 metres below the cell, above clay that has very high permeability. The data is showing 223 years for one layer if it's fully immersed in leachate, but this is dry so the life is exponentially longer.

Discussion about liner research and lifetime.

Stage one of constructability is not only about building the cell and liner types, but also how to get the least amount of environmental issues. This includes the access routes, temporary set down areas, storage areas. Stage two is to relocate the stockpiles that are in the future position of the cell.

Stage three is excavation and stockpiling of the material from the cell. Stage four is to construct the actual lining system itself, normally in a landfill we would finish stage four and start bringing in waste. We would use these small bones to control everything. But at this site we will build everything. Stage five is the placement of demolition and external stockpiles within the containment cell. Stage 6 is the removal and stockpiling of capped waste stockpile capping material, so we will take it away and use it as a new cap as it is very good quality material. Stage 7 is placement of capped waste stockpile within the containment cell, bear in mind stage 5, the stockpiles are already on site. This and stage 7 will happen simultaneously because we'll utilise the existing stockpiles to protect liner, and then we will bring in some waste.

Darrin Gray: Will contaminated soil come out of the demolition?

Andrew Walker: There will be some asbestos. We know there is asbestos still in the basement of line 1 underneath the basement slab in the fume duct trench. There will be possibly some small amount of fluoride laden alumina which will be stored in the back furnace area under cover. There will also be scrubber bags which contain a small amount of fluoride. We're intending to keep all that waste under cover, out of the weather. Once this goes into the cell, any leachate that comes off it will be treated on site or offsite.

David Barrett: Even with the capped waste stockpile, for constructability, you look at them as individual stages. The entire cap won't be stripped off, they'll do it in very small portions to reduce leachate generation.

Michael Ulph: is the pot lining out of the weather and will it be recycled?

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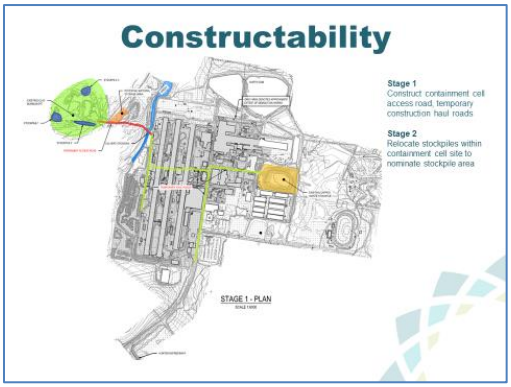
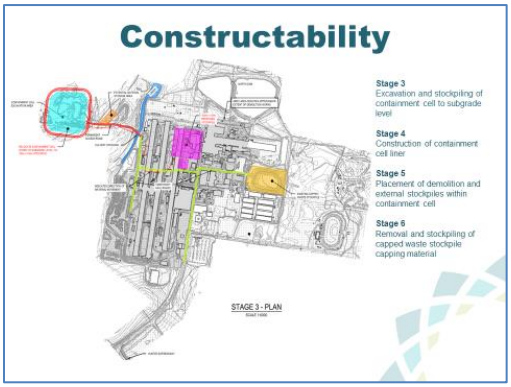
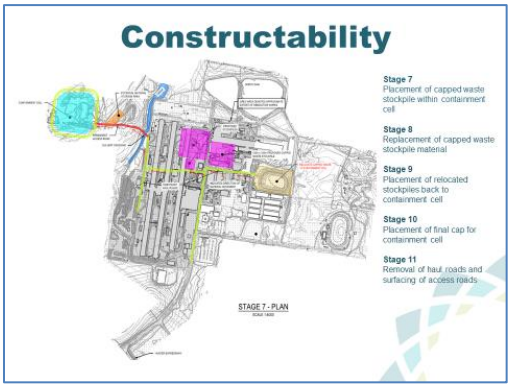
Andrew Walker: It is covered in a building until it will be recycled. That building won't be demolished until it's all been recycled.	
Allen Gray: Will there be any pot liner being put in? **Andrew Walker:** No.	
David Barrett: Stage 8 is the replacement of capped waste stockpile material. Stage 9 is the replacement of stockpile materials back into the containment cell. Stage 10 is the placement of final cap for containment cell followed by stage 11- the removal of haul roads and surfacing of access roads.	
Michael Ulph: Are there any questions for David?	
Ian Shillington: There needs to be an access road, doesn't there?	
David Barrett: There will still be a sealed access road in and around the site. It's just the temporary roads that will be surfaced. There will be removal of concrete pads by the leachate pond, the concrete pads at the sumps will be left but everything else will be gotten rid of.	
Andrew Walker: The whole road between the cap waste stockpile and the containment cell will be scraped in case of any leachate spill which has seeped into the surface of the road.	
Michael Ulph: You mentioned stopping work if there is rain planned, so do you have an estimated time frame from stage 1 to stage 11?	
Andrew Walker: Time frame is estimated to be 46 weeks is the critical phase for the period where the cap waste is exposed and waste is transported to the new cell. This should be minimised to reduce the chance of a major storm event occurring.	
David Barrett: Everything including the access roads and the bridge across unnamed creek has been built for very large trucks, which will accelerate the process, and then it's all about how much we can operate safely.	
Darrin Gray: Is there anything keeping community members, motorbikes out?	
Andrew Walker: There will be a long term maintenance plan for the site which will involve security. The cell should not be damaged by anybody getting into the site. There would be 1.5 metres of soil before you get to a liner.	
Michael Ulph: What angle is the external slope of the cell?	

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David Barrett: One in five, to one in twenty. **Michael Ulph:** It's a pretty gentle slope. *The group discusses the potential future use of the site and site access.*	

7 Project update

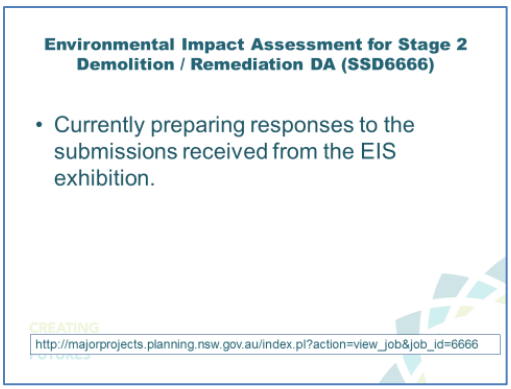
Andrew Walker: We mentioned at the last CRG meeting that because the main issues with the EIS and the State Significant Development are around remediation. We decided to take the demolition out of the main project and go for a separate approval with Cessnock Council and that's so that we can get on with demolition. Otherwise, there will be a big delay in the demolition of buildings. We want to get on with stage 1 and stage 2 and we have engaged a contractor and we do not want to have to demobilise and remobilise.

We have just received the Secretary's Environmental Assessment Requirements (SEARS) back from the Department of Planning and we'll be starting to work on an EIS which will cover stage 2 demolition. The scope of stage 2 involves explosive demolition of concrete structures - the three stacks and the water tower. Demolition of foundations and services to one and a half metres below ground level and demolition of any storage buildings storing SPL, after we've recycled the SPL.

Kerry Hallett: Have you organised the recycling through request for tender or expressions of interest?

Andrew Walker: We're still working through that commercial process but we're getting very close to moving forwards.

Part of the approval will be for a mobile crushing plant with the capacity of up to 1,000 tonnes a day to crush all the concrete from the demolition. That is designated development so we need to do an EIS for that.

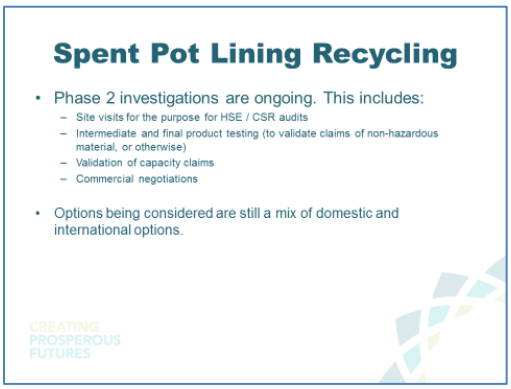


In response to the main EIS, that is covering the remediation, we're working on the response to submissions which should be ready in the next few weeks. We're still waiting to get some information back from one of our consultants with modelling from our floodwater study.

Michael Ulph: Is this flood study the same as the one used for rezoning?

Andrew Walker: No this is not the same one, this is mainly to do with the Unnamed Creek and making sure the site where the cell will be built is well above the height of probable maximum flood level.

We are also doing a site water balance to make sure that during the remediation, we can contain all the stormwater within the existing stormwater management system. This is also taking into

Notes	Action
account the input of water from rainfall and the use of water on site, like having water carts taking water from the north dam and using it for dust suppression on site. This is being modelled at the moment. The spent pot lining recycling is getting very close. We are still working through commercial processes, waiting for contractors to get back to us with quotes. We are hoping to get something going very soon. The rezoning hasn't changed since the last meeting. **Gareth Curtis:** Can I just mention, that Maitland Council got onto that flood modelling as quickly as you possibly could. Flood studies can take years. It might sound like a long time, but getting that done by the end of 2017 is actually not bad. **Ian Shillington**: Yes there are a lot of stages and processes to go through. **Gareth Curtis**: That process with the rezoning is progressing quite well. **Andrew Walker:** We are also working on a process to get a party interested in purchasing the site after the demolition and remediation has finished.	 

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8 CRG membership & TORs Review

This item was moved to next meeting due to time constraints.

Michael Ulph: This item will be held over until the next meeting unless there is anything pressing. I guess the previous action was asking whether other people should be represented here. The Mindaribba Land Council will hopefully be represented at the next meeting. Tara Dever, the new CEO has shown interest, but was in Tamworth today.

9 Questions and Answers from the CRG/General Business

Michael Ulph: Now time for questions; has there been any Questions from community members?

Alan Gray: The containment cell should serve the community, the community will be cautious about what happens on site. The first question the community will have will be about spent pot liner disposal. The community wants to know about recycling of the spent pot liner.

Darrin Gray: Distributing newsletters to put in front of the community is a good idea, for cell design for example.

Kerry Hallett: How long from demolition to development are we looking at?

Andrew Walker: I would say a minimum of five years to get through demolition and remediation, before anything else can occur on site.

Kerry McNaughton: A Site Developer is likely to come on board a lot sooner than the demolition/remediation time frame. A number of potential developers have expressed interest in the site and dialogue is continuing.

Notes	Action
10 Meeting close *Meeting closed: 7:55 pm* Next meeting: Thursday, 17th August 2017 6:00 pm to 7:30 pm