



Australian Government
Department of Industry,
Innovation and Science

**National
Radioactive Waste
Management Facility**

Barndioota Consultative Committee

Meeting Notes

Tuesday 24th July 2018

Agenda

Time	Item	Lead
Tea and coffee available from 09:30		
09:30-09:35	Welcome to country	Aaron Stuart
09:35-10:00	Housekeeping <ul style="list-style-type: none"> - Apologies - Overview of the meeting agenda - Business arising of meeting notes 26 June 2018 - Approval of the Draft Notes of meeting of 26 June 2018 - Observer Protocol – meeting attendees 	Paul Thomas, Independent Convener
10:00-10:30	Project Update <ul style="list-style-type: none"> - AECOM update - July Information - Transport, Infrastructure & Benefits - Heritage Survey Update - Confirm with BCC the dates for next meeting & draft agenda - Cadence to present on economic study - UQ conducted ongoing socio – economic study - WEWG report on construction evening 	DIIS – Bruce Wilson
10:30-10:45	Morning Tea Break	
10:45-11:15	AECOM – Site Characterisation study	AECOM – James Rusk
11:15-11:45	Dr Victor Gostin presenting geological implications of the NRWMF site in the Barndioota area	Adelaide University - Dr Victor Gostin
11:45-12:00	Geoscience Australia role with the NRWMF site in the Barndioota area	Geoscience Australia – Brian Hanisch
12:00 -13:00	Lunch Break	

13:00-13:30	Transporting radioactive materials	ANSTO – Hef Griffiths
13:30-14:00	Economic Impact Assessment of the NRWMF	Cadence Economics - Steve Brown & George Michalas
14:00-14:30	Other Items – questions on topics of the day from the BCC <ul style="list-style-type: none"> – Contract arrangements with BCC members and conflicts of interest – Traditional owner benefits – Costs and Economic Working Group contribution to the Industry day – Any further questions relating to ILW storage at the facility as a result of the information provided earlier today. 	Paul Thomas, Independent Convener Rebecca Mouthaan, DIIS

Attendees:

Paul Thomas (Independent Convener)	Greg Flint (Deputy Convener)	Philip Fels
Ashley Haywood	Jon Gill	Julia Henderson
Susan Andersson	Victor Clark	Aaron Stuart
Dianne Ashton	Steven Taylor	Cecilia Woolford
Denise Carpenter	John Hennessy	
Ronald Daniel	Janice McInnis	

Apologies:

David Michael	John Rowe	Rachel Vella
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Other Attendees:

Name	Organisation
Bruce Wilson	DIIS: NRWMF Project Team – Principal Advisor
Rebecca Mouthaan	DIIS: NRWMF Project Team - Manager of Community Consultation Team
Ian Carter	DIIS: NRWMF Project Team – Manager in the Community Consultation Team
Adam White	DIIS: NRWMF Project Team - Community Consultation Team
Nicholas Clifford-Hordacre	DIIS: NRWMF Project Team – Community Consultation Team

Stephanie Skinner	DIIS: NRWMF Project Team – Community Consultation Team
Zaheer McKenzie	DIIS: NRWMF Project Team - Community Liaison Officer
James Rusk	AECOM
Dr Victor Gostin	Adelaide University
Dr Brian Hanisch	Geoscience Australia
Hef Griffiths	ANSTO
Steve Brown	Cadence Economics
George Michalas	Cadence Economics

Observers:

Sue Tulloch	Bob Tulloch
Cynthia Clark	Malcolm McKenzie
Greg Bannon	Olga Ostin
Barbara Walker	Bronwyn Lucas
Janet Thomas	Leon Ashton

Action Items

Item	Status
1. AECOM to provide information from the seismic data on the liquefaction of the ground / what is the amplification at the site	Complete
2. Department to provide the links to the Geoscience Australia site that provide real-time data	Complete
3. Update on the Wallerberdina Economic Working Group Construction Workshop cost	Complete
4. Provide the presentations: <ul style="list-style-type: none"> • AECOM • Geoscience Australia • Dr Victor Gostin • ANSTO • Cadence Economics 	Complete – reports published on website
5. Fact sheets & reports available at: <ul style="list-style-type: none"> • Post office • Teague • Local office • Quorn library 	Complete
6. BCC members to provide contact address for OCA area	Complete
7. Provide a copy of the signed letter by Ms Sam Chard addressing concerns on the WEWG Industry Expo Day to the committee	Complete

Meeting opened 09:30am

Welcome to Country

- Aaron Stuart gave a Welcome to Country.

Housekeeping & Overview of the meeting agenda

Discussion

- The convener introduced the agenda and an overview of meeting.
- The convener acknowledge the 10 observers in attendance and noted the observer protocols had been submitted.
- Member raised the Wallerberdina Economic Working Group (WEWG) held an event on the 11th July 2018 in Quorn and requested an update from the WEWG.
- A member requested a presentation from ATLA or VYAC, it was discussed at the April meeting, and the member stated the convener took it on notice.
 - The department noted it was unusual to ask one stakeholder group to attend and not others. The department also noted some members of the BCC are Adnyamathanha. The department added the Adnyamathanha people have been involved in the heritage survey work at Wallerberdina.
 - The department informed the committee further queries on this topic would be addressed in the agenda - Other Items.
- A member requested further information on the event proposed for Quorn with ARPANSA presenting.
 - The department advised an information session will be held in Quorn and Hawker Tuesday 7 August. The NRWMF Facebook page has a list of events showing timings and location.
- A member raised concern of volume of information released by the department and that they were not released early enough. To give them due diligence they should have been released earlier so members had more time to reflect on the data.
 - The convener said that these reports were not released for discussion today, they were for public information.
 - The department added that the information was always scheduled to be released at this time to give the public time to digest the information before the ballot. All of this information was available to the public through the department's website and that it was important for BCC members to have the information to pass on.
- A member raised that it is difficult to distribute them when they are so large.
 - The department advised they would make the information available in public places. Members were asked for any suggestions of where copies should be located and to please pass that information on.
- A member requested at future meetings could the Q&A session be held earlier in the agenda.

Action Item: Distribute the AECOM reports to the local NRWMF office, council chambers, libraries and Teague’s Hawker.

Approve draft notes of 26th June 2018 meeting

Members approved the notes from the 26th June 2018 meeting with the following amendments.

- A member raised that the notes read that the ANSTO presentation was similar to one they had received previously. It was two presentations that were similar.
- A member raised the meeting notes show a Mr Fels as an apology, the member confirmed that the member had attended the 26 June meeting.
- A member advised that page 15 states “the department informed the committee the Wallerberdina Economic Working Group (WEWG) would not make a presentation”. The member asked the notes be amended to reflect that a member initiated this discussion, not the department.
- A member queried the cost of the WEWG Industry Expo day dinner.
 - The department informed the committee the information will be provided under today’s agenda.
- A member asked whether the socio-economic studies conducted by the department will investigate the criteria for emergency services.
 - The department responded this is addressed through Preliminary Safety and Waste Acceptance Report of the National Radioactive Waste Management Facility (NRWMF). The report is available on the NRWMF website, please find the [link to the report](#).
- A member advised there was some discussion around police presence at the facility and whether it would require a tactical response.
 - The department advised that they will provide a response today.
- Members noted the late submission of the meeting notes.
 - The department accepted the notes were submitted late.

Project Update

Mr Wilson (DIIS) informed the committee all information on the following has now been provided by the department and is available on the NRWMF website:

- Site characterisation reports
- Community benefits package
- Heritage reports
- Indigenous participation plan
- Factsheets covering most of the project
- Safety report

Mr Wilson asked if the BCC would consider holding another meeting prior to the vote and sought input from members on whether that meeting should go ahead.

Mr Wilson informed the committee of upcoming events:

- In Kimba, Quorn and Hawker the department has finalised a community information session planned for 6th & 7th August. The CEO of ANSTO, CEO of ARPANSA, officials from the Department of Environment, Geoscience Australia and radiation and nuclear medicine experts will be in attendance.
- A webinar will be held prior to the vote, on August 10th, regarding the management of Australia's radioactive waste. Invitees include Dr Jim Green, Mr Dave Sweeny and Dr Margaret Beavis.

Mr Wilson noted the community ballots were on track. The department was working with the Flinders Ranges Council (FRC) and the Outback Community Authority (OCA), and asked if any committee members know anybody living in the OCA area to please pass their details on to the department.

Action Item: BCC members to pass on people living in the OCA area

Discussion

- A discussion took place on who is eligible to vote.
 - The convener summarised and informed the committee – if you live there and you are on the roll you get a vote.
- A member raised that in previous notes it was stated that the committee asked the department to advertise the ballot and the department had responded that advertising was the responsibility of the FRC, as they are facilitating the ballot. The member noted they had only seen something small in the council newsletter and there has been no public advertisement. The member queried whether the department is concerned about advertising as we approach the vote.
 - The department noted that The FRC is facilitating the vote, and the department cannot comment on how they choose to advertise the vote. The department noted it had done everything it can to make sure that people are aware the vote is coming and need to get registered.
- A member raised the FRC vote application form said that they get one vote for a property, despite the property being co-owned by multiple people.
 - The convener noted that if you live there and are on the roll then you get a vote. However, if you are not registered in this area then you can apply and if you meet the criteria you will get one vote.
 - A member added that people who are registered on another roll, can apply because they live in the zone.
 - The department noted that some people who are normally on the roll will be automatically included, but this is supplemented by the application process. Criteria has to be met to be entitled to a vote. The department is contacting as many people as possible who may not automatically get a vote to encourage them to apply.
- A member proposed that alternate views be invited and included in the upcoming information session. The member stated during the time of the BCC only one alternate view presenter had been invited and the department had presented more times. That is not balanced.

- The department advised requests need to come through the convener from the whole committee rather than a few individuals. It is up to the committee to make the request and we have not refused any requests.
- The convener stated he has previously asked the committee to submit names of people to present. There are people you want to hear from, I believe we have had those people.
- A member asked whether the committee had the opportunity to ask for Geoscience Australia and AECOM to present today?
 - The department had individuals request certain people but it was waiting for the committee to give it the request. It was asked for AECOM and GA because we were asked for more information so that's what it was doing. The department proposed the agenda because it thought it is useful information. If other people have agenda items they were asked to please contact the convener and the department will respond.
- On the matter of the vote, the department noted there were tensions within the community and asked everyone respect each other's view, as the department would like to see the public debate and discussion done with respect. The department had a message left for one of its staff which was disrespectful. That was inappropriate and it was asked that debates and discussions are conducted without making it personal.
- The department asked the committee to read the published reports and factsheets to be fully informed. The department stated there was a lot of misinformation in the community at the moment in particular on where the proposed sites are. Discussion and delivery of facts through the published reports was encouraged.
- A member raised they would prefer the webinar with alternative views be held as a town hall scenario in a public forum.
 - The department was aware the community wants to hear information. The department is also hosting the community information sessions for members to come and receive information. It did not want to have a debate because it was not the department's role to advocate a position. If the community wants to hear other points of view then the community can do that. The department's role was to provide the facts. It could not see the value in organising a debate.
 - The convener questioned – If there are people who have an opposing opinion, is there a forum or a way to enable a webinar for those people to ask those questions?
 - The department agreed to look into this. The department welcomed the pre-submission of questions to make sure they are answered. There will be a moderator to help with the questions.

\$31 million funding package

The convener invited the department to discuss the Minister's announcement on the \$31 million funding package.

Mr Wilson provided a summary of how the package was developed:

- The department listened to the community, and \$10 million was deemed not sufficient.

- The package:
 - An \$8 million Community Skills and Development Program, delivering grants over the four year licencing and construction period to maximise the community benefits from the construction and operation of the facility
 - An increased \$20 million National Radioactive Waste Management Facility (NRWMF) Community Investment Fund, to deliver long term infrastructure and development benefits to the community
 - The \$20 million investment fund which is available once the facility is licenced, that is structured differently to the Act. We will structure that with the host community, managed independently from government.
 - Up to \$3 million over three years from the Government's Indigenous Advancement Strategy (IAS) to strengthen Indigenous skills training and cultural heritage protection in the successful community
 - The department will not manage the fund. Appropriate government controls will be put in place as the details are finalised.

Discussion

- A member sought clarification on the details which are to be determined. Is there a commitment on that in writing?
 - The department advised that there was a short amount of time to get the package pushed through. It has been agreed by government and the offer is on the table. The implementation details are very clear the department will need to come back and get that locked in. The department will do that in consultation with the host community.
- A member sought clarification that Kimba council had requested a fund that would generate \$1 million per year, if they did not receive this they would withdraw from the process.
 - The department stated that was not correct.
- A member questioned how the \$31 million value come about and how did the discussion take place?
 - The department derived the package in consultation with the communities, councils and submissions over the past year.
 - The package was formed on the basis of letters, community discussions, Economic Working Groups, various groups who went to Canberra and met the Minister including indigenous members. The department provided the feedback and cabinet made the decision.

AECOM Site Characterisation Presentation

James Rusk spoke to the site characterisation studies that AECOM had conducted.

Purpose and objectives: Identify any hazards or infrastructure hazards.

AECOM had utilised a range of dedicated technical specialists to conduct the studies including but not limited to seismologists, geologists, hydrogeologists, geomorphologists and hydrologists. AECOM had conducted its assessment against a range of site characteristic criteria that were developed with reference to Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and International Atomic Energy Agency (IAEA) guidelines relating to the selection and evaluation of sites being considered for the siting of radioactive waste facilities.

The study investigated the:

- Location
- Below ground environment
- Above ground environment
- Cultural heritage
- Infrastructure

Findings

- Originally there were three sites, through the heritage process two were discounted.
- Investigated the threatened species in a 10 km radius of the area.
- Climate studies took place from Bureau of Meteorology records,
 - Findings - hotter climate over time and less rainfall.
 - Potential for higher intensity rainfall to occur.
 - Potential for bushfire with dryer conditions.
 - Low fire risk because the shrub is sparse.
 - If you do get a fire front it can be stopped quickly.
- Background radiation levels are very low. 1 percent of safe levels. From future monitoring, with low levels, should anything occur you could quickly pick that up.
- Surface water. Large area that was mapped, data was used as part of the cultural heritage assessment, accuracy of 10 cm.
- Detailed view of where some of the drainage lines were.
- Localised and catchment scale flooding.
- Studied events and peak flow rates to occur once in 5, 20, 50, and 100 years.
- Floods can be mitigated by design solutions.

AECOM summarised the hazards identified and the data collected ensuring the design would take into consideration the magnitude of floods and seismic activity. AECOM conducted predictive modelling on what the impacts would be on the site. AECOM stated from the work conducted to date the hazards are manageable.

Discussion

- A member asked what happens when the bridge on Hookina Creek blocks up?
 - AECOM advised the study considered the rail line and other areas that can channel water, which were mapped. If the culvert gaps are not large enough then they might cause blockages. In terms of the bridge across the creek

AECOM have not considered that because we are interested on the impacts on the site itself (rather than potential impacts from a flood event on the redundant rail line and rail bridge over Hookina Creek).

- A member stated if the creek blocks then the water goes back. A lot of water was there in 2007 when it flooded.
 - AECOM stated it would have to look at that event. That might have been a 1 in a 300 year event.
- A member asked what faults were identified?
 - AECOM stated no evidence of faults at the three sites. Bedrock was estimated at 240 meters below the surface and no evidence of faults.
- A member asked if the drilling intersected coal?
 - AECOM stated there was organic material at 220 meters below the surface.
- A member asked at what depth water was intersected and are the wells permanent?
 - AECOM stated four wells were used to target the shallow zones, around 40 meters below the surface. The wells are permanent but they can be decommissioned.
 - AECOM informed the BCC wire logging of wells occurred. This method provides information on the density of the different rocks and indicates if water is present.
- A member asked if the drilling intersected the bedrock?
 - AECOM stated the well did not intersect bedrock, there were difficulties with the well and after four weeks the decision was made to stop drilling.
 - AECOM informed the BCC seismic data confirmed the depth to bedrock.
- A member asked what was the quality of the water?
 - AECOM stated water was suitable for livestock but would need to be treated for drinking water.
- AECOM informed the BCC of other findings on land form stability. The site is on a flood plain. Material observed at the site occurs from rare and infrequent flood events. A number of sand dunes were observed. Vegetation forms on the dunes and maintains the structure. AECOM identified the dunes have potential for curving over time. AECOM recommended further modelling.
- A member asked could the facility connect to current infrastructure or would new plant be required?
 - AECOM stated there are arguments for and against this. AECOM investigated upgrades to roads, connecting to powerlines and building sub stations. AECOM considered renewable options such as solar. Solar would require batteries to increase reliability but diesel power would be required as backup.
 - AECOM stated for communication reliability a tower would be needed.
- A member asked for clarification on the ground water. There is a channel that runs north to south in the site. If I understand correctly the worst case scenario is that it will flood to a foot?
 - AECOM advised that was correct based on a 1 in 100 year event.
- A member asked with the tributary taking off, would the railway line act as a levee?
 - AECOM informed the member the spacing of the culverts and heights of the ground surface have been measured along the rail line. AECOM has identified

areas of preferential channelling between the culverts and this has been considered as part of the model.

- A member asked about climate change predictions to the year 2090 and noted the area would be drier than today. Is there a chance the vegetation will dry up and drift away?
 - AECOM stated they did not expect this to occur as the vegetation is robust to the conditions. There will be longer periods of heat which needs to be monitored.
- A member asked what is the height difference between the site and Hookina Creek?
 - AECOM stated it did not have the number at hand but confirmed the site is the last area that would flood.
- A member asked what is the height difference between the site and Hookina Creek?
 - AECOM stated it did not have the number at hand. In terms of areas on the site, with the exception of some of the ranges, from a major event point of view where there is breakout from Hookina Creek it's the last area that gets any flooding.

ACTION item: AECOM to provide information from the seismic data on the liquefaction of the ground / what is the amplification at the site

ACTION item: provide AECOM presentation – [please find the link to the presentation](#)

Dr Victor Gostin University of Adelaide Presentation on Flinders Ranges Geology

Dr Gostin spoke to the geological history of the Flinders Ranges based on his work on the area over 40 years.

Geological history of the Flinders Ranges

Dr Gostin discussed the changes in the landform and how uplift and erosion have resulted in today's features of the ranges and surrounding landscape. Dr Gostin informed the BCC that drainage patterns were established around 45 million years ago. This was typical of that time, the deposits hold material such as coal, clay and sand.

Dr Gostin informed the BCC the gorges geologists observed today were formed recently and that implies recent uplift of the landscape. The uplift occurs because of the tectonic compression from the SE to NW direction. This informs us the ranges are pushing upwards. This compression with resulting earthquakes still continues and has resulted in the old bedrock of the ranges becoming thrusting west and over the alluvial fans. The compression occurs against the thick stable crust. The rate is very slow by human standards but it is fast geologically. The rate of movement from the east and upward along faults occurs at 20 to 50 meters per million years. The ranges have pushed up and over the gravel that is 30,000 years old.

Earthquakes of the region

Dr Gostin presented a series of slides on seismicity in Australia over the last decade. Dr Gostin cited Pilia et al 2013. Dr Gostin presented to the BCC the findings and stated the Flinders Ranges region is a relatively high seismicity zone. Dr Gostin cited the work of Cummins, P., C. Collins, A. Bullock, and D. Love (2004) “compared to the rest of continental Australia, the Flinders Ranges region of South Australia stand out not only because of its high topographic relief, but also because of its high seismicity and high fault density.”

Climate Change

Dr Gostin related climate change to the sedimentary rocks he has studied. The sedimentary rocks identify past sea level changes and weather changes. The changes can be measured by chemical isotopes. The isotopes indicate the warm and cold periods about every 100,000 years. Alluvial fans south of Barndioota have been constructed over 40,000 to 30,000 years. Dr Gostin stated we have to look at what happens around the last glacial maximum. The alluvial fans were then deeply incised about 15,000 years ago. Around 20,000 years ago the last glacial maximum, strong westerly winds eroded the dry Lake Torrens, covering all the ranges with thick silts. Flooding winter rains rapidly washed the slit down into the main creeks, choking them and depositing silts upstream of all gorges.

Summary statements by Dr Gostin

- The 2007 flood reached the rail bridge.
- In 1955 a 85 tonne concrete pillar was washed downstream.
- In the 1955 flood the creek rose over 10 meters carrying trunks of big gum trees.
- Lake Torrens is 100,000 years old. It is maintained by continuous degrading by wind, it will not stop in the future.
- Any waste facility site should occur on stable crust.
- Long term outlook is to look at past constructions and mines, for example Fukushima (nuclear power plant), Ok Tedi and Ranger mine have underestimated the power of natural catastrophes.
- Deep geological containments are preferable than sites on the surface.
- Nuclear waste is best buried in bedrock such as granite.
- A site on alluvium is the worst possible site. Sediments amplify the effect of seismic waves such as Christchurch, NZ. Attenuation is due to surface alluvium.

Discussion

- A member asked what is the opposition of LLW?
 - Dr Gostin responded that he has no opposition to the LLW. Putting the ILW on a high seismic area is risky. We do not know what climate change will bring.
- A member asked Dr Gostin to clarify Emeritus Prof. Chris von der Borch statement that the material would be radioactive for tens of thousands of years.
 - Dr Gostin responded, this was a question for ANSTO. He stated the need to have a long term view.
 - The department advised the radioactive time frame for the LLW is less than 100 years up to approximately 300 years.
- A member stated the ILW will not be stored there indefinitely.

- Dr Gostin stated the ILW will be on the surface and suggested the proposed site to be considered elsewhere.
- A member asked Dr Gostin on his views of LLW at the site.
 - Dr Gostin stated LLW doesn't concern me. There are two ILW categories. Our definition is different to the Europeans.
- A member questioned Dr Gostin on the seismic risk of a facility at Barndioota compared to Japan considering they build multi storey building to withstand earthquakes.
 - Dr Gostin responded, we do not need to consider this site, as it is in a high seismic active area.
- A member stated the geology goes back tens of thousands of year but the project is only for 300 years. It will reach a level where it is harmless.
 - Dr Gostin responded, the ILW is the concern.
 - The department agreed the facility is not suitable for long term ILW disposal. It is temporary. The ILW would be there for temporarily and then moved to a permanent site.
- A member asked Dr Gostin, throughout the studies, how did you look at aboriginal adaptation in regards to climate change? We did a study with Flinders University with John Tillby discussing how aboriginal people adapted to climate change? Part of the journey whether the site is suitable, surely mankind can adapt to climate change and future catastrophes. You did not touch on how the aboriginal people managed the change.
 - Dr Gostin responded, I am not an anthropologist.
- A member asked Dr Gostin, Aboriginal people arrived before others came to Australia. The world is changing but surely it is possible to come up with something to keep the facility safe with the right design?
 - Dr Gostin responded, as a scientist, he was merely making a point that we can choose many other areas that are more suitable. Extreme events of drought and other events that cover these areas. I was just presenting evidence. He noted changes such as the Antarctic and global warming, are all related and we don't know the future, we do not know what changes will be in the climate. It appears increased unpredictability is coming.
- A member stated, I think we have to adapt as humans on how to handle our waste.
 - Dr Gostin responded, of course but we need to take a longer term view.
- A member stated, we understand the ILW will come here for 30 years. There is a risk that the ILW could be stranded here.
 - The department responded, Dr Gostin analyses informs us that nothing has occurred in the last 15,000 years. Will it be stranded for that long? I accept the geological timeframes but the ILW will not be here for that period, the ILW time frame is known.
- A member stated some problems cannot be overcome and used the Fukushima plant as an example.
 - The department replied the example is not relevant to this site.
- A member informed the BCC that Alison MacFarlane was in Australia and she was Obama's nuclear safety advisor. She recommends ILW be stored underground. She said that strongly. We need to heed some advice from people who know this.

- Mr Griffiths informed the BCC he spoke to Alison MacFarlane about that. Ms MacFarlane said she was talking about disposal that should be in a geological facility. Interim storage has to cater for the existing context. In the USA at the moment all their waste is above ground.
- The department advised the government has agreed that ILW will be disposed of in a separate underground facility. When the facility is established one of the first jobs will identify an ILW disposal pathway. It was agreed this facility was not a long term disposal method of ILW.
- The department also agreed with Dr Gostin that this area was not suitable as a disposal site for ILW and that is why we are not proposing to do that. However, there was nothing in the work of AECOM, which looked at the site specific risks raised by Dr Gostin using up-to-date and site specific (not regional) data
- A member asked if it would have been better to dispose of LLW and ILW at the same facility rather than move it around the country.
 - The department responded, ILW has to be underground but LLW does not. The department could have put it off but it could be 30 more years. The department need to find a LLW disposal pathway now and we cannot put it off.
- A member stated that is an error of judgement?
 - The department stated, as we move forward our understanding gets better. Australia is moving forward, when the nuclear industry first started it was acceptable to put waste in a shed. We are at a point where the regulator is saying it is no longer acceptable to generate the waste and solve the problem later. The technology exists to solve it and that is what the department is doing.
- A member asked Dr Gostin to explain the state of sediments in a jelly like form and what was the impact?
 - Dr Gostin responded that amplification of the sediments was the issue.
 - James Rusk AECOM informed the BCC and Dr Gostin that information is in the report and will supply the information to the BCC.
- A member asked AECOM what degree of earth quake did you monitor?
 - AECOM responded, it is all about the return period, the worst case scenarios occur rarely are long periods – 1000 or 2000 events that may occur once every 1000's of years were considered. This information of AECOM's work was peer reviewed by Geoscience Australia.
- The department noted Dr Gostin's findings in relation to LLW. However it was noted this work has been sent to the department and reviewed. AECOM and Geoscience Australia were the experts. The department does not believe Dr Gostin's finding that this site (Barndioota) is not the right place is valid. Dr Gostin's assumption, the facility will be there for tens of thousands of years and blow into the lake, these are assumptions. The conclusion of Dr Gostin's work states this is not the place to deposit ILW and LLW. We do not agree with the conclusion for LLW. The risks over this timeframe do not apply. AECOM has taken the landscape analysis for the actual site and the worst case scenario in 1 or 2000 return period. The risks can be

managed and managed well. If we were proposing for a 10,000 year period then it would come into play. The ground will move 15cm over 300 years.

- A member asked Dr Gostin, what is your opposition to LLW?
 - Dr Gostin replied, not opposition. Putting the facility on a high seismic area is risky. We do not know what climate change will bring. If we go into an ice age then we will get flooding and droughts.
 - The department responded the ice age occurs every 100,000 years.
 - Dr Gostin responded that man made changes have altered the time frame with hot gas. We are in uncertain times.
- A member raised the point, even though there has not been a major earthquake here, it could happen at any time.
 - Dr Gostin responded, that is correct. We have that information from boreholes which have enormous stresses on them. We have evidence of rock moving up and over other gravel.
 - DIIS responded, our risk management is to mitigate that. If we had a major earthquake that would breach the barriers that is what we look at. Our approach is how do we stop that material getting to the environment.
- A member asked did the Japanese consider that or BHP?
 - The department responded, in Fukushima, the facility survived the earthquake. The pumps flooded and the cooling was lost.

ACTION item: AECOM to clarify what is the amplification at the site –AECOM response
Attached

ACTION item: provide Dr Gostin presentation to the BCC – [please find link to the presentation](#)

Dr Brian Hanisch Presentation on Geoscience Australia role of the Barndioota site

Dr Brian Hanisch spoke to Geoscience Australia's (GA) peer review of the site characterisation work conducted by AECOM.

Dr Hanisch provided an overview of GA's responsibilities as a national agency in the areas of mineral resources and mapping the Great Artesian Basin. He also informed the committee the range of scientific expertise at the agency, Geologists, Geophysicist, Geochemists, Seismologists and Hydrologists.

GA's key activities:

- Landscape and landforms
- Geology, geotechnical and geochemical
- Seismic activity and
- Hydrology

Key Points on the work between GA and AECOM:

- AECOM has been using GA data. We provide data to industry to identify potential areas for exploration.
- Hazards branch, look at exposure, vulnerability and hazards of an area.
- GA provided data to AECOM which is critical to the study.
- GA has a significant ground water role, the hydrology role builds on its significant expertise in mapping the Great Artesian Basin.

GA's role in the NRWMF

Dr Hanisch stated GA's role in the work is not for site characterisation. Dr Hanisch informed the committee GA's primary role with the project was the peer review of the work conducted by AECOM. The reports have been gone through by my team several times.

We did not want to receive a report at the end and then find problems. So GA were involved throughout the process, our standards in terms of data collection are quite high. Because we are maintaining that knowledge as an Australian asset we have been involved from the very start. We have attended a number of meetings with AECOM and question them on assumptions and findings and evidence that supports them. GA scientists have checked AECOM data. All through the process AECOM have been open. GA has generated a deep understanding in the science that sits behind the report. GA will continue to be involved as more data comes to light and ensure the site characterisation has been done professionally.

Dr Hanisch summarised the peer review process for the committee:

- Workshops and teleconferences with AECOM.
- AECOM responded to GA questions.
- Discussions and review AECOM data.
- Data package assessment and desktop assessment reports.
- More than 12 plus scientists have reviewed the data, information and reports.
- Each AECOM reports go through a GA internal review with section leaders, then branch heads and then the chief of division.
- This is a thorough review.

Discussion

- A member asked what information specific to South Australia was included in the review.
 - Dr Hanisch stated papers such as Dr Gostin's were referenced.
 - The desktop assessment is based on existing data. A lot of it is from GA. AECOM over the years has come to GA for their data.
- A member asked has GA read the report by AECOM and concur with all the findings?
 - Dr Hanisch stated, yes.
- A member asked, in regards to water, where on the GA site would we find the prediction and event and consequences of the rainfall in 2007? Would it be documented?

- Dr Hanisch replied GA has this information going back 30 years.
- Dr Hanisch provided an example of the peer review process with AECOM. GA provided instructions where seismic lines should be and how long. AECOM have taken that on board.
- A member asked how flood predictions were generated?
 - GA draws on expertise of Bureau of Meteorology (BoM), they have rainfall predictions. BoM have scientists that specialise in that. GA is not limited to its own data, GA works closely with state organisations and CSIRO. We have access to super computers which gives GA the ability to conduct predictive modelling.
- A member stated the report refers to 2007 as a 1 in 100 year event but data does not go back that far.
 - GA has published information on the flooding of events, which is used by insurance companies. This information is available on the flood risk website. GA have been able to pick up a lot of those water courses through the topography modelling.

ACTION item: the department to provide the links to the GA site that provide real-time data. Please find the links below.

Flood studies can be accessed here: <http://www.ga.gov.au/scientific-topics/hazards/flood>
 Water Observation from Space (WOfS) can be accessed here: <http://www.ga.gov.au/scientific-topics/hazards/flood/wofs>
 Information on earthquake risk can be accessed here: <http://www.ga.gov.au/scientific-topics/hazards/earthquake>
 Information on reflection seismic survey can be found here: <http://www.ga.gov.au/about/projects/resources/seismic>

ACTION item: provide GA presentation to the BCC – [please find the link to the presentation](#)

Hef Griffiths ANSTO Transportation Presentation

Mr Griffiths provided an overview of the transportation of radioactive material:

- ANSTO has lots of experience, 20 million packages each year.
- 20,000 shipments of spent nuclear fuel over the last 50 or so years.
- ANSTO has had 9 safe shipments of spent nuclear fuel from the High Flux Australian Reactor (HIFAR).
- Transportation like many sectors has regulatory controls, Australia has adopted International Atomic Energy Agency (IAEA) guidelines, implemented through ARPANSA standards.
- Australia is one of the 130 countries of the IAEA. Australia has an obligation to comply with their transport standards.
- The standards have been reviewed on a 5 year basis but hasn't fundamentally changed.

- Fundamental principle, the packaging has got to be sufficient to provide protection against both the normal rigours of transport and any foreseeable accident.
- The amount of material determines the level of protection required.

Testing of the packaging.

ARPANSA approve packaging for radioactive material. Each package must be designed and type tested to show it meets a range of requirements. For higher levels of radioactive material the standards get more stringent.

For example, one of the testing process of containers for ILW is that it must meet the 9 meter drop test. ARPANSA approve this testing method.

- Radioactive material can be shipped via road, train, sea or air.
- The material we would expect to leave Lucas Heights is similar to what you already see on the roads these days.

Discussion

- A member asked what are the transportation routes?
 - Mr Griffiths replied, we are still unsure of the location of the facility and once it is confirmed we will investigate the transport routes.
- A member asked how long have you been producing isotopes?
 - Since the mid 1970's.
- A member queried the volume of material associated with the TN81
 - Mr Griffiths said that the TN81 contains 20 canisters, each with a volume of 170 litres of vitrified waste. The waste currently stored in the TN81 is, therefore 3.4 metres cubed.
- A member asked the decay rate of material in the TN81?
 - Mr Griffiths informed the BCC – ANSTO estimate 99 percent of this material will decay within the first 600 years. The reprocessing removes the long-lived species, with the activity being dominated by isotopes with a half-life around 30 years. Vitrified and Synroc would be similar timeframes. The spent uranium filter cups from Mo-99 production will be longer lived, but a high proportion of that material would also decay significantly in the first 600 years.
- A member asked about the person who was injured at ANSTO in August 2017?
 - Mr Griffiths advised that he cannot talk about that because it was medical in confidence. ANSTO is very engaged with that worker at this stage and is giving as much support as ANSTO can. ARPANSA did their own investigation, ANSTO put a lot of effort in trying to rectify those conditions. Specifically to do with Quality Assurance of radiopharmaceuticals. After that ANSTO put a lot of measures in to eliminate the requirement for people to carry out the normal quality controls. One measure was to dilute the samples and that was done with the approval of ARPANSA.
 - ARPANSA is focusing on one small part of a licence as part of our 18 licences.

- The department asked Mr Griffiths on the impact of not being able to transport nuclear medicine?
 - Mr Griffiths responded, on the experience ANSTO has had with the broken conveyer. The delay was because we just had to wait for the material to decay and to meet the Therapeutic Goods Administration (TGA) requirements to return to sterile production conditions. The delay reinforced the importance of having a domestic supply. It is a logistical challenge to get material from the USA. We have had technical issues on planes as material sit on tarmacs. More of an impact felt in regional areas because of the limited supply, the big centres were given material first. This would also be the case if you used cyclotron. M-99 has 66 hour half-life. Cyclotrons produce the actual material (Tc-99m) that has a 6 hour half-life. Can't take that further than the production facility. Also a lot of issues with the production process itself.
- A member asked about the certification of drivers.
 - Mr Griffiths responded that the material is classified as UN class 7 and all drivers must be trained for this. ANSTO also train other drivers from other companies who want radiation training. The security requirements for transporting is worked out by NSW police and AFP.

ACTION item: provide ANSTO presentation to the BCC – [please find the link to the presentation](#)

Cadence Economics Presentation

Steve Brown gave an overview of the economic impact study.

- During the construction phase total spending in Hawker economy would be \$10 million for the 4 year period.
- Construction worker expenditure in the local economy for the same period would be \$16.2 million.

Cadence was asked by the department to investigate the impact of a facility of comparable sites on agriculture and property prices. Cadence conducted a national and international study to determine a comparison case and did not find any evidence to support a negative impact on agriculture or property prices. Areas that were investigated Aube, France, Hope Island, Canada and Engadine, Sydney.

Key Points:

- Project assumed start in 2021.
- \$250 million in construction and \$75 million of enabling works.
- The economy of Hawker to supply this construction is not there. Other contractors would be required to come to the town during construction. 20 percent of the workforce is assumed to come from Hawker. On the flipside the migrant workers

from outside the region who settle here in the 4 year period account for local expenditure. There is a trade-off between doing it domestically and having people come in to do the work.

- Operational phase – the estimated spending from the facility that will take place until 2051. Just under \$7 million per year on ancillary services, fuel, servicing. Ongoing expenditure of what is supplied by the local region. In terms of employment, 45 full time jobs. Of those, 34 will come from Hawker/Quorn. It was not assumed that the 34 come from outside the workforce.
- 2023 is peak construction phase and then 2030 of when it is operational.

Discussion

- A member asked where will the 34 people come from?
 - Mr Brown responded, people re-locate. The benefit is a net. Like anything if someone offers another position with higher wages the lower will be harder to fill.
- A member asked the Cadence literature review did not find any adverse effects on house prices or tourism or agricultural?
 - Mr Brown responded, that is correct.
- A member asked, the 34 people will they come from Hawker? Have you done studies who takes those positions?
 - Mr Brown responded, the modelling had taken a conservative approach. The modelling assumed the 34 people move into positions that pay them more. The estimate is based on Commonwealth treasury numbers that backfill those positions. Any kind of project projection is how many people you can bring in in the workforce.
- A member asked, does the model take into account the 34 jobs that will shift from a standard pay job to a higher pay. The employer is impacted and then competing for employees with a government department pay rate compared to the current private lower pay rate. What is the impact on local business?
 - Mr Brown responded, that is included in this model. There is a fixed amount of resources, other resources can suffer. It is a net measure of the pluses and minuses. The GDP numbers included the positives and negatives. Overall the economy is a winner. When you get more people who will come into the workforce the pressure is eased. The best case scenario is we get all the people from the existing area. This would result in higher numbers.
- A member asked, do you mean Hawker and Quorn?
 - Mr Brown responded, correct. The more people to backfill the job the better it will be.
- A member asked, we don't actually have 34 vacancies, what if they get taken out?
 - Mr Brown responded, correct, people re-locate. The benefit is a net. Like anything if someone offers another position with higher wages the lower will be harder to fill.
- A member asked will the workforce for the construction phase be sourced from outside the towns of Hawker and Quorn?

- Mr Brown confirmed this and stated money could be spent in town from this activity.

ACTION: [please find the link to the Cadence presentation](#)

Other Items

Ms Rebecca Mouthaan spoke to the release of all fact sheets and reports now available on the department website and addressed questions raised by the BCC.

- RPS report – the report has not been redacted by the department. The report was redacted at the request of the Heritage Working Group (HWG) and related to the sensitivity of the information.
- The department asked the HWG / VYAC if they wanted to present on the report but they declined.
- On the question of the cost of the industry day held in May.
 - The total value of the event was \$50,000.
 - The WEWG were involved and instigated the event.
 - The department worked with the WEWG to advertise the event.

Discussion

- A member raised that there was a problem with the way department has handled the advertising of the ILW. The member provided the following timeline of events.
 - May 2015 department said the selection framework says that it will have LLW and ILW.
 - In September 2016 it was also said that LLW and ILW would be co-located.
 - When the French presented, there was a response that the department has been clear that the preferred solution was to co-locate LLW and ILW.
 - That was the first time maybe the facility would house ILW.
- The department responded, at the first town hall meeting the community were informed the facility would be LLW and ILW storage. It was always the government's preference to co-locate the LLW and ILW which is why we were upfront about it and it was discussed early. However we were waiting on government confirmation that this would occur and once that was confirmed we were able to inform the communities of that commitment.
- The WEWG was set up in April 2017. It was stated in there that it would be LLW and ILW. That was the first time it was confirmed the facility would house ILW.
 - The department responded, at the first town hall meeting the community were informed the facility would be LLW and ILW storage. It was always the government's preference to co-locate the LLW and ILW which is why the department were upfront about it and it was discussed early. However the department were waiting on government confirmation that this would occur and once that was confirmed we were able to inform the communities of that commitment.

- Ms Mouthaan informed the committee the department will attend a Senate Inquiry 2 August and the Information evening to be held in Quorn and Hawker on 7 August.
- A webinar will be held on the 10 August – Panel members include:
 - Mr Dave Sweeney
 - Dr Margaret Beavis
 - Mr Scott Ludlam
 - Dr Jim Green
 - Dr Adi Paterson
 - Dr Geoff Currie
 - Dr Ben Heard
 - Mr Bruce Wilson

August meeting

- The convener asked if the BCC would like to meet in August and opened the discussion on having an August meeting. The convener asked the BCC, do we see a benefit in that?
- The department asked the BCC for agenda items.
- The BCC agreed to a 14 August meeting on Q&A post the information event and webinar. Questions for the 14 August meeting please send to the convener. The convener stated we should also have a mechanism for taking questions on notice.
- The convener mentioned we want to have a meeting following the vote, whether it is positive or negative.

Post vote

- A member asked, when the vote is complete, when will the minister make a final decision?
 - The department responded, it will require due process. The Australian Electoral Commission will report back to the councils and whether they want to make it public. The department will have to get the results and report on other submissions and provide the Minister with that information. The department will do that ASAP but we do not know when the Minister will do that.
- A member stated in April the Minister said it would be October. Following that there will be a 60 day consultation.
 - The department responded, under the Act the Minister has to do that. The Minister will not cut corners and the Minister will take some time to consider the information.
 - The department informed the BCC, the community ballot is not the be all and end all. The Minister will take the views of community groups into account and the technical factors of each site, including cost. The community number is not the sole determinant.
- A member asked, when the Minister makes the decision, will the Minister say why?
 - The department informed the BCC that is what the Minister did that last time for the Kimba vote.

BCC Contracts

Ms Mouthaan reported on the question by a member on contract payment for BCC members.

- There is no differentiation for contracts.
- All BCC members are paid the same.

The convenor asked all members to consider conflict of interest declaration, if circumstances have changed you should update them.

Questions

- A member asked what happens after 2045 when the ILW goes somewhere else, what happens to the community and the town when it disappears? Another member mentioned the CEO ARPANSA stated once the ILW is removed there is no economic benefit.
 - The department stated that was not correct. What the CEO said was when you relocate the ILW, it is not like a daylong thing. There will be a wind up and wind down period. The facility with disposal will go along for 100 years. I cannot give you a guarantee of what will happen in 2045. Mr Griffith's can talk to staging a work program.
 - Mr Griffiths informed the BCC he put together the 45 jobs. There would not be a cliff edge with the ILW. Part of the modelling we are looking at is how to stage the legacy waste and the ILW to come to the facility so you can have the jobs for the longest period of time. ANSTO is looking at ILW disposal, there is no reason why people managing this facility could not manage the disposal of the ILW which would continue the jobs. With the LLW facility, the majority of those jobs would stay.
 - The department asked Mr Griffith's, how many jobs are attached to the ILW?
 - Mr Griffith's advised, 10 – 15 waste technicians.
- A member discussed the short time frame notifying the community of University of Queensland (UQ) conducting interviews in the community. The member was dissatisfied with the short notice.
 - The department informed the BCC, there was an ethics approval that needed to be complete before commencing. The department had to wait for that. Once approved the department had to make a date. The department also had to compete with the senate inquiry visiting the region. The department wanted to get UQ out as quickly as possible so there was maximum time for the community to access the study.
 - The member stated the UQ study was confusing and did not represent their feelings.
- A member asked, what was the WEWG involvement in the Industry expo day and what was the purpose of the day and were items sourced locally?
 - The department responded, this was the idea of the WEWG. The department tried to maximise local services. The department made every effort to include local contractors. The WEWG did direct the department to some businesses to ensure that as much work was filled by local contractors. For example the department searched locally for marquee hire but this was not possible.

- A member stated they were not informed of the construction event held in Quorn.
 - Another member confirmed the BCC had been informed.
 - The department responded, from the first few agendas, the WEWG asked to get some things done, one being an industry day to address local business. The second was a method to inform local business how to engage in training for the construction and operational phase of a facility. ANSTO provided school trips to Lucas heights and ANSTO presentations locally. These key outcomes by the WEWG were discussed early with the department.
 - A member disagreed they had been informed, the member stated they had asked at the same meeting for ATLA to attend the next meeting.
- A member asked would the remainder of Wallerberdina be granted to VYAC?
 - The department is not purchasing or granting the rest of Wallerberdina station to anybody. The landowners will decide what they want to do.
- A member highlighted to the committee the impact of the 45 jobs on local wages. They expect the facility would offer higher wages than those currently on offer. This could have serious impact on local business.

ACTION item: provide the BCC update on the cost of the Construction Workshop

ACTION item: provide a copy of the signed letter addressing concerns on the WEWG Industry Expo Day – please find Attached

Meeting Closed 02:30pm