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Submission to the Parliamentary Standing Committee on Public Works re the Australian Nuclear Science and Technology Organisations radioactive waste management extension and upgrade

March 2016

The Australian Conservation Foundation (ACF) welcomes this opportunity to comment on ANSTO's proposed radioactive waste management plans.

ACF has an active and long-standing interest in a range of nuclear issues, including ANSTO's operations and in advocating for responsible radioactive waste management in Australia.

ACF's key observations in relation to the application before the Public Works Committee include:

(i) This application should not be viewed in isolation from the current wider National Radioactive Waste Management Project (NRWMP) These issues share clear synergies and decisions would be better informed through reference to the wider policy landscape.

(ii) There is a compelling case for upgrading extended interim storage capacity at ANSTO

(iii) ANSTO's wider nuclear medicine assumptions are contested and its business plan to increase radio-pharmaceutical production for the international market has significant downstream consequences and should be further interrogated.

Please find attached a position paper from national environment groups titled *Responsible Radioactive Waste Management in Australia* exploring options for an integrated and inclusive approach to advancing this objective. We provide this to further inform the Committee's consideration of this submissions observations in relation to point (i) above.

ACF would be happy to provide further material or speak to this submission should the Committee require any further detail. ACF's contact person on this matter is Dave Sweeney via d.sweeney@acfonline.org.au or 0408 317 812

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(i) Current radioactive waste policy issues and developments: the NRWMP

PWC members would be aware that radioactive waste management has been a long contested public policy area. Multiple attempts by successive federal governments to identify a remote or regional site for a co-located national storage/disposal facility have failed to deliver either community consent or a facility location.

ANSTO's application for a waste management facility extension and upgrade occurs at the same time as a key period in the revised National Radioactive Waste Management Project (NRWMP).

The NRWMP was initiated following the end of an earlier protracted and fiercely contested plan to develop a national radioactive waste facility at Muckaty in the Northern Territory.

Under this process there are currently six sites under active consideration as a potential location for a future dedicated national radioactive waste facility. ACF has formally welcomed the government's repeated commitment over the progress of the NRWMP that any facility would require broad community support and would not be imposed on an unwilling community.

It is our view that this is an essential pre-condition to any future success of the NRWMP and also that has not been realised at any of the six sites currently being considered.

Given this ACF supports improving ANSTO's waste management capacity and maintains that extended interim storage at ANSTO makes sound regulatory and radiological sense and provides an important opportunity to remove unnecessary and unhelpful time pressures and thus provide scope for a dedicated public examination of the full range of management options, including – but not restricted to, the current preferred central co-location model.

It is ACF's view that such an approach would significantly increase the likelihood of developing a responsible and lasting national approach to radioactive waste management.

(i) The public interest case for extended interim storage at ANSTO

ACF, along with many national environment and civil society organisations, maintains that extended interim storage at Lucas Heights is the current least worst management option, as:

- ANSTO has certain tenure, a secure perimeter and is monitored 24/7 by Australian federal police. Security at Lucas Heights is far more rigorous than has been proposed for remote sites.

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- ANSTO is already both the continuing producer of and current home to the vast majority of Australia's higher level radioactive waste

- Storage at ANSTO means the waste would be actively managed as operations at the site are licensed and anticipated to continue for many more years.

- ANSTO storage keeps waste management on the radar of the facility/people with the highest concentration of nuclear expertise and radiation response capacity in Australia.

- Since the government realised in 2012 that the planned national waste facility at Muckaty would not be in place prior to the return of reprocessed spent nuclear fuel waste from France in December 2015 ANSTO has constructed and commissioned a new purpose built on site storage shed dedicated to housing this waste.

- Extended interim storage at ANSTO helps reduce the political pressure to rush to find a 'remote' out of sight, out of mind dump/store site and increases the chances of advancing responsible management.

- Storage at ANSTO has been publicly identified as a credible and feasible option by ANSTO, nuclear industry lobby group the Australian Nuclear Association and the federal nuclear regulator, the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

- Storage at Lucas Heights would negate risks associated with transportation over thousands of kilometres - also if waste is moved out of Lucas Heights some decades into the future, it would be considerably less hazardous due to radioactive decay in the interim.

- This approach avoids potential double-handling – e.g. LLILW being moved to a remote store only to be moved again later to an as yet undecided deep geological disposal site.

- This approach would require producers of radioactive waste management to take increased responsibility for their own waste – a practise consistent with accepted waste minimisation principles.

- Importantly, this approach also provides the ability to have a circuit breaker in this long running issue in the form of an evidence based and open review of the full range of longer term management options.

It is important to note that Lucas Heights would continue to operate as a waste storage site even if an off-site storage/disposal option was available as ANSTO routinely produces radioactive waste at the site and any future removal of waste from Lucas Heights would only occur on an infrequent basis.

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Relevant government organisations and other stakeholders have acknowledged that ongoing storage at Lucas Heights is a viable option:

- Dr Ron Cameron, ANSTO, when asked if ANSTO could continue to manage its own waste: "ANSTO is capable of handling and storing wastes for long periods of time. There is no difficulty with that. I think we've been doing it for many years. We have the capability and technology to do so."[1]

- Andrew Humpherson, ANSTO: "Lucas Heights is a 70-hectare campus with something like 80 buildings. It's a large area. We've got quite a number of buildings there which house radioactive materials. They're all stored safely and securely and all surrounded by a high-security perimeter fence with Federal Police guarding. It is the most secure facility we have got in Australia."[2]

- Dr Clarence Hardy, Australian Nuclear Association: "It would be entirely feasible to keep storing it [radioactive waste] at Lucas Heights ..."[3]

- Former ARPANSA CEO John Loy: "Should it come about that the national approach to a waste repository not proceed, it will be necessary for the Commonwealth to devise an approach to final disposal of LLW from Lucas Heights, including LLW generated by operation of the RRR. In the meantime, this waste will have to be continued to be handled properly on the Lucas Heights site. I am satisfied, on the basis of my assessment of the present waste management plan, including the license and conditions applying to the waste operations on site, that it can be."[4]

- Department of Education, Science and Tourism: "A significant factor is that ANSTO has the capacity to safety store considerable volumes of waste at Lucas Heights and is unlikely to seek the holding of frequent campaigns to disposal of waste holdings generated after the initial campaign."[5]

- ANSTO's submission to the current PWC process states that the facility is secured, isolated and maintains that "with over 50 years expertise in safely managing nuclear material and its by-products, ANSTO is well equipped to store small amounts of radioactive waste which are produced through its operations on an interim basis."

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[1] ARPANSA forum, Adelaide, 26 February 2004, http://web.archive.org/web/20040610143043/http://www.arpansa.gov.au/reposit/nrwr.htm#forum
[2] September 2008, www.abc.net.au/news/2008-09-22/new-nuclear-waste-site-for-sydney/517372
[3] ARPANSA forum, Adelaide, 26 February 2004, http://web.archive.org/web/20040610143043/http://www.arpansa.gov.au/reposit/nrwr.htm#forum
[4] April 2002, Decision by the CEO of ARPANSA on Application to construct the Replacement Research Reactor at Lucas Heights. Reasons for Decision", p.30.
[5] Application to ARPANSA, 2003, Vol.iii Ch.9 Waste – Transfer and Documentation p.5.

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(section 2.1.4) Further section 3.4.5 flags the possibility or future modification or new construction associated with ANSTO's waste management regime.

However the purpose of this submission is not to argue that waste stored at Lucas Heights ought to remain there. Rather ACF maintains that extended interim storage at Lucas Heights is both technically feasible and that this option warrants consideration alongside other options – and that the assumption that a remote repository/store is the best or sole management solution needs to be tested.

Nothing about the nuclear industry, especially nuclear waste, is clean or uncomplicated but we view extended interim storage as the least worst approach and one - that if coupled with a wider public review of the full range of longer term management options - is most likely to create the shared understanding required to most productively advance responsible radioactive waste management.

Although this is not strictly related to the specific application before the Committee it is clearly linked and we would welcome the PWC considering a recommendation that the federal government give further consideration of the full range of longer term radioactive waste management options in any PWC report arising from the Committee's consideration of ANSTO's specific application.

(ii) ANSTO's contested nuclear medicine assumptions and the consequences of the planned increase in radio-pharmaceutical production

Much of the debate around radioactive waste management in Australia has been unhelpfully and sometimes inaccurately conflated with nuclear medicine access and supply issues.

This was also evident in relation to media associated with ANSTO's current application and the PWC process. News Limited newspapers and websites ran the story below on February 4, 2016. On February 11 in response to questioning in Senate Estimates about this report ANSTO CEO Dr Adi Paterson outlined that the article was based on information that has been 'superseded'. There is no credible risk that medical isotope production will stop in fact the opposite is true as ANSTO is significantly increasing radio-pharmaceutical production.

ACF is not aware of any public clarification or correction from ANSTO addressing this report or the superseded nature of a widely conveyed threat. ACF has further not received a formal response from ANSTO to a request for clarification and detail on ANSTO's response. Coming at a pivotal period in a public consultation period around potential siting of a national radioactive waste facility ANSTO's failure to clarify this issue added extra pressure to affected communities and was not consistent with measured policy development or Dr Paterson's Senate Estimates assertion that ANSTO's role is to provide a 'factual and evidential basis'.

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AUSTRALIA'S only nuclear reactor will be forced to stop manufacturing lifesaving medicines by the middle of next year unless radioactive waste storage facilities are expanded. (Peter Jean, News Ltd, 4/2/16)

Three South Australian sites are being considered as possible locations for a new permanent home for Australia's radioactive waste. But the National Radioactive Waste Management Facility is not expected to be ready until 2020. In the meantime, plans have been developed for a $22 million upgrade and extension of two secure waste storage facilities on the Lucas Heights Nuclear Reactor campus in Sydney. The Australian Nuclear Science and Technology Organisation, which runs the Lucas Heights reactor, has stressed the urgency of the extensions in a submission to federal parliament's Public Works Committee. "Without additional interim waste storage capacity, ANSTO's ability to operate within its regulatory framework will be compromised when its current waste storage capacity is exhausted in the first half of 2017,'' the ANSTO submission said. "At this time, it would have to cease critical business operations, including the production of lifesaving nuclear medicines, impacting Australia's health system and patients." ANSTO's plans will be scrutinised by the Public Works Committee and it will have to be approved by the Australian Radiation Protection and Nuclear Safety Agency. About 85 per cent of the nuclear medicines used in the diagnosis and treatment of cancer, heart, bone and kidney conditions are manufactured at Lucas Heights. Federal Industry Minister Josh Frydenberg yesterday said Australia needed to have the capacity to safely manage waste produced at Lucas Heights. "Each week the Australian Nuclear Science and Technology Organisation delivers 10,000 patient doses of potentially lifesaving nuclear medicines to over 250 hospitals and medical practices across Australia and overseas,'' Mr Frydenberg said. "The Government is committed to safely and responsibly managing the byproducts from these processes by establishing a permanent, national radioactive waste management facility." Consultations with communities near the six short-listed sites for a permanent national radioactive waste facility are due to be completed next month. The three possible sites for a radioactive waste storage centre in SA are at Cortlinye and Pinkawillinie, northwest of Kimba, and Barndioota, along the Leigh Creek railway to Port Augusta. Mr Frydenberg, who will visit Adelaide on Friday, said a final site would be identified this year. "The outcomes and feedback of the consultation process will help inform the Government's consideration of the next phase of detailed assessment, which will involve further community consultation, technical assessment, and a shortlist of two to three sites with an expectation of a final site being identified before the end of this year,'' he said. A Royal Commission examining options for South Australia to become more involved in the nuclear fuel cycle is due to release its tentative findings on February 15.

(iv) Other issues in relation to ANSTO's PWC submission

- ACF is aware of the sustained critique from a number of stakeholders, including the Medical Association for the Prevention of War, in relation to ANSTO's insistence on reactor based radio-pharmaceutical production (2.1.1). Given that this is a key driver

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of planned increased future radioactive waste volumes it would be prudent to further interrogate this issue and test ANSTO's assumptions and business case.

- ACF queries ANSTO's assertion (1.3) that one in two Australians will require a nuclear medicine made at ANSTO during their lifetime. Is this an accurate reflection of current individual patient doses or an averaging of production rates to population? Many people will never need ANSTO materials, some will require large volumes of them and ACF seeks clarification of the factual and evidential basis of this figure.

- ACF disputes ANSTO's claim that the proposed NRWMF role is to provide for the 'permanent' storage of radioactive waste. ACF understands that the proposed facility is to be for the permanent disposal (shallow burial with no intention to retrieve) of low level waste but only for the extended storage of higher level radioactive waste pending disposal at an as yet undecided location.

- ACF seeks clarification with the apparent conflict in the representation of ANSTO's waste management capacity in sections 2.1.4 and 2.1.5.

- Along with ANSTO's review of current waste storage methodology (2.1.7) ACF urges the PWC to give consideration to recommending a parallel review of the rationale for increased waste production and options for enhanced waste minimisation.

- ACF seeks clarification on the apparent conflict between ANSTO's assertion that there will be 'an extensive regulatory review process' (2.6.3) and the fact that the planned extensions 'will not require a new license'.

End.

RESPONSIBLE RADIOACTIVE WASTE MANAGEMENT IN AUSTRALIA: THE CASE FOR AN INDEPENDENT COMMISSION OF INQUIRY

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1. Introduction

This paper explores advancing responsible radioactive waste management in Australia through a dedicated National Commission or comparable public inquiry mechanism that considers the full range of available management options. Such an approach would provide enhanced community and procedural confidence and rigour and ensure greater stakeholder engagement with and ownership of this issue. This is particularly important given the failure of successive federal governments to advance a decades-old approach based on developing a centralised remote radioactive waste facility. Long-held plans for such a facility at Muckaty in the NT were abandoned during the course of a Federal Court trial in June 2014 and the National Commission idea now provides an important opportunity to move toward a more inclusive and evidence-based approach in this contested policy arena.

Attempts by successive federal governments to impose a radioactive waste repository in South Australia (1998−2004) and the Northern Territory (2005−2014) failed. Those attempts were characterised by a crash-through-or-crash approach. State/territory legislation banning the imposition of nuclear waste dumps was ignored, and Aboriginal land rights and heritage protections were overridden.

The failed attempts to establish repositories assumed the need for off-site, centralised facilities, but a closer examination reveals that i) that assumption may not be warranted and ii) there are major information gaps that need to be addressed before informed decisions can be made.

Importantly, world opinion is shifting in the direction of bottom-up, consultative, consensual approaches to radioactive waste management and Australia needs to learn from those experiences.

To break the long-standing policy impasse and proactively address the deep trust deficit that exists within key stakeholders, the federal government should establish a National Commission to thoroughly investigate the problem and possible ways forward.

This paper outlines the reasons why a Commission of Inquiry should be established and raises a number of the issues it should tackle.

2. Radioactive Waste inventory

It is not possible to make informed decisions about Australia's radioactive waste management options without accurate information about waste stockpiles.

Rough figures have been provided by various government agencies regarding stockpiles of lower-level radioactive wastes (LLW − low-level and short-lived intermediate level waste) and long-lived-intermediate-level waste (LLILW). However the figures vary and gaps have been evident (because of the tardiness of state/territory governments in providing information, amongst other reasons). Moreover the radioactive waste inventory is of course in flux, due to the ongoing production of waste and also because of the radioactive decay of existing waste.

Thus an important, preliminary task is to establish an accurate and up-to-date database of Australia's radioactive waste stockpiles including:

- volume/mass;
- radioactivity (since volume/mass is not a good indicator of hazard − for example 2,000 cubic metres of radioactive soil stored at Woomera accounts for around half of the volume of waste destined for repositories in SA and the NT until those projects were abandoned, but the soil accounts for far less than 1% of the radioactivity of such wastes);
- nature and adequacy/inadequacy of current storage conditions; and
- nature and adequacy/inadequacy of institutional control.

3. Net benefit as a guiding principle

The principle of net benefit is useful to frame the discussion. The NHMRC Code of Practice for the Near-Surface Disposal of Radioactive Waste in Australia (1992) requires that "No practice involving exposures to radiation should be adopted unless it produces sufficient benefit to the exposed individuals or to society to offset the radiological detriment it causes."[1]

Likewise, section 41 of the ARPANSA Regulations 1999 lists matters the CEO of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) must take into account when considering a licence application, including: "Whether the applicant has shown that there is a net benefit from carrying out the conduct relating to the controlled facility." That requirement is also specified in subsection 32(3) of the ARPANS Act.[2]

Yet successive federal governments have made no effort whatsoever to attempt to demonstrate a net benefit with their (failed) radioactive waste repository proposals.

[1] www.arpansa.gov.au/pubs/rhs/rhs35.pdf
[2] www.comlaw.gov.au/Series/F1999B00034

In 2004, ARPANSA held an inquiry into the proposal for a waste repository in SA.[3] A government official was asked to justify the claim that a centralised repository would reduce the cumulative risk of storing waste. The response was that: "In terms of someone sitting down and doing that risk assessment, that hasn't been done − the short answer is it hasn't been done." The official said that the repository proposal was being pursued on the basis of a "general belief" and another official said it was a "general feeling".

The situation has not changed in the 10 years since the 2004 ARPANSA inquiry − there has been no effort to assess waste management according to net-benefit principles, not even a superficial attempt.

Prof. Ian Lowe, who sat on the ARPANSA panel that held the 2004 inquiry, summed up some of the unresolved questions and problems:

> *"DEST [the federal Department of Education, Science and Tourism] told the forum that "Disposal of the waste in a purpose-built national repository will reduce the cumulative risks of storing wastes", leading to the conclusion that "The community and the environment will benefit". Questioning revealed that the basis for this assertion is shaky. ... There are some difficult issues to be resolved if the applicant is to show that the proposal would provide a net benefit to the community, most obviously including a risk assessment to determine whether the increased risk of collecting and transporting waste is outweighed by the reduced risk of storage at a properly engineered repository; this study should take into account the continuing need for local storage of waste between the proposed disposal campaigns. A professional risk assessment cannot be conducted until a firm waste acceptance plan and transport code are developed."*[4]

Clear cost-benefit and net-benefit rationales should be explicitly applied to assess radioactive waste management options and to inform credible prioritisation within the suite of options.

4. Free, prior and informed community consent as a guiding principle

Public involvement in decision making, and informed consent to proposals, is essential if an equitable outcome is to be achieved. Involvement and informed consent are also desirable from a practical point of view − around the world, communities have successfully mobilised to force the abandonment of nuclear repository proposals on numerous occasions.

The NHMRC Code of Practice for the Near-Surface Disposal of Radioactive Waste in Australia (1992) states: "Site selection shall include a suitable consultative process to establish public consent to the location of a disposal facility at the particular site."[5]

But in practice, successive Australian governments have pursued top-down, crash-through, Decide−Announce−Defend approaches which have failed in SA and the NT (and in many other locations around the world).

The UK Committee on Radioactive Waste Management noted in a 2006 report:

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[3] http://web.archive.org/web/20040610143043/http://www.arpansa.gov.au/reposit/nrwr.htm#forum
[4] http://web.archive.org/web/20040610143043/http://www.arpansa.gov.au/pubs/nrwr/lowe_rpt.pdf
[5] www.arpansa.gov.au/pubs/rhs/rhs35.pdf

> *"Experience from the UK and abroad clearly demonstrates the failure of earlier 'top down' mechanisms (often referred to as Decide-Announce-Defend) to implement long-term waste management facilities. It is generally considered that a voluntary process is essential to ensure equity, efficiency and the likelihood of successfully completing the process. There is a growing recognition that it is not ethically acceptable for a society to impose a radioactive waste facility on an unwilling community. ... Willingness to participate should be supported by the provision of community packages that are designed both to facilitate participation in the short term and to ensure that a radioactive waste facility is acceptable to the host community in the long term. Participation should be based on the expectation that the well-being of the community will be enhanced."*

Likewise, the UN Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management – to which Australia is party – notes that "public consultation on radioactive waste management strategies was not only a good practice to follow, but was also essential for the development of a successful and sustainable policy."[6]

Likewise, the OCED Nuclear Energy Agency's report − 'The Decommissioning and Dismantling of Nuclear Facilities: Status, Approaches, Challenges' stated: It is widely accepted that openness and transparency are essential for the winning of public approval ... The local public is increasingly demanding to be involved in such planning and this may accelerate introduction of concepts such as “stepwise decision making”. The challenge for the future, therefore, will be satisfactory development of systems for consulting the public, and local communities in particular, and the creation of sources of information in which the public can have full confidence."[7]

Likewise, the European Union's 2006 'Inventory of Best Practices in the Decommissioning of Nuclear Installations' states: "[F]inal waste repositories must be sited where local communities are willing to give their consent to these facilities for many generations. Experience has shown that, without this consent, the project will sooner or later be cancelled, stopped or indefinitely delayed − one way or the other. Therefore, siting must focus on three key issues: the safety of the repository system; the impact on local image and socio-economy; the importance of public acceptance and how it can be reached."[8]

Radioactive waste management approaches emphasising consultation and consent clearly represent a qualitative step forward yet they raise challenges of their own, including:

- Situations where community consent is forthcoming but proposed sites are sub-optimal on other criteria (meteorological, geological, etc.).
- Impoverished communities offering land for toxic waste facilities to receive benefits which they ought to be entitled to in the first place as a basic citizenship entitlement. This situation has been called 'radioactive ransom'. In the Australian context, it is important to de-couple the linkage between radioactive waste management and addressing systemic Aboriginal economic marginalisation. Such an approach is needed in order to satisfy the pre-conditions for the application of Free, Prior and Informed Consent.
- Governments may not accept informed community decisions, such as the recent political manoeuvring following a decision in north-east England to reject a proposal for a radioactive waste repository.

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[6] www.iaea.org/Publications/Documents/Conventions/jointconv.html
[7] www.oecd-nea.org/rwm/reports/2002/3714-decommissioning.pdf
[8] http://ec.europa.eu/energy/nuclear/decommissioning/doc/05_2006_11_decommissioning_best_practice_report.pdf

Along with the UK experience there are also valuable lessons for Australia from the 'Blue Ribbon Commission' process in the US.[9]

International experience ought to be considered by an independent National Commission as there is much that could be applied to increase the likelihood of an effective, lasting and responsible approach to radioactive waste management.

5. Thorough assessment of all management options – LLW

Successive governments have assumed that a shallow, remote repository is the solution for LLW. That assumption needs to be tested. Measured by radioactivity, a large majority of LLW is stored at the Lucas Heights site operated by the Australian Nuclear Science and Technology Organisation (ANSTO). ANSTO expects to continue to operate at the Lucas Heights site for many decades into the future and it is by no means clear that a remote repository is preferable to ongoing storage at Lucas Heights − and no government has even attempted to demonstrate a net benefit of a remote repository.

It may be the case that ongoing storage at Lucas Heights is a preferable medium-term option for the following reasons:

- Australia's nuclear expertise is heavily concentrated at Lucas Heights;
- storage at Lucas Heights would negate risks associated with transportation over thousands of kilometres (moreover if waste is moved out of Lucas Heights some decades into the future, it will be considerably less hazardous due to radioactive decay in the interim);
- security at Lucas Heights is far more rigorous than has been proposed for remote repository sites;
- this approach would require producers of radioactive waste management to take increased responsibility for their own waste – a practise consistent with accepted waste minimisation principles;
- it avoids potential double-handling – e.g. LLILW being moved to a remote store only to be moved again to a deep geological disposal site.

It is important to note that Lucas Heights would continue to operate as a waste storage site even if an off-site waste storage/disposal option was available, because waste is routinely produced there. According to the federal government, removal of waste from Lucas Heights would occur on an infrequent basis.

All relevant government organisations (and others) have acknowledged that ongoing storage at Lucas Heights is a viable option:

- Dr Ron Cameron, ANSTO, when asked if ANSTO could continue to manage its own waste: "ANSTO is capable of handling and storing wastes for long periods of time. There is no difficulty with that. I think we've been doing it for many years. We have the capability and technology to do so."[10]

[9] Some of these lessons are detailed in Thomas Webber et al., 7 June 2012, 'Improving public and stakeholder engagement in nuclear waste management', Bulletin of the Atomic Scientists, http://thebulletin.org/web-edition/op-eds/improving-public-and-stakeholder-engagement-nuclear-waste-management.

[10] ARPANSA forum, Adelaide, 26 February 2004, http://web.archive.org/web/20040610143043/http://www.arpansa.gov.au/reposit/nrwr.htm#forum

- Andrew Humpherson, ANSTO: "Lucas Heights is a 70-hectare campus with something like 80 buildings. It's a large area. We've got quite a number of buildings there which house radioactive materials. They're all stored safely and securely and all surrounded by a high-security perimeter fence with Federal Police guarding. It is the most secure facility we have got in Australia."[11]
- Dr Clarence Hardy, Australian Nuclear Association: "It would be entirely feasible to keep storing it [radioactive waste] at Lucas Heights ..."[12]
- Then ARPANSA CEO John Loy: "Should it come about that the national approach to a waste repository not proceed, it will be necessary for the Commonwealth to devise an approach to final disposal of LLW from Lucas Heights, including LLW generated by operation of the RRR. In the meantime, this waste will have to be continued to be handled properly on the Lucas Heights site. I am satisfied, on the basis of my assessment of the present waste management plan, including the license and conditions applying to the waste operations on site, that it can be."[13]
- Department of Education, Science and Tourism: "A significant factor is that ANSTO has the capacity to safety store considerable volumes of waste at Lucas Heights and is unlikely to seek the holding of frequent campaigns to disposal of waste holdings generated after the initial campaign."[14]

However the purpose of this paper is not to argue that waste stored at Lucas Heights ought to remain there, but rather that this argument is one option that warrants consideration alongside other options − and that the assumption that a remote repository/store is the best or sole management solution needs to be tested.

Storage vs. disposal

An argument commonly made in favour of radioactive waste repositories is that they relieve future generations of any monitoring and management responsibility; and conversely, storage imposes a burden on future generations. The argument rests on the false premise that disposal repositories do not require monitoring and will not require remediation. Maralinga is a case in point (discussed further in section 7 below). Burial of radioactive waste at Maralinga has not lifted the burden of monitoring. Moreover, 19 of the 85 waste burial pits at Maralinga have been subject to erosion or subsidence barely a decade after the latest 'clean up'. Clearly long-term monitoring and remediation will be necessary.

Scientific and medical institutions

Similar arguments apply to scientific and medical institutions which continue to produce waste (typically at very low levels, and with small accumulated stockpiles):

- They require on-site radioactive waste stores even if waste is periodically removed (one government documents suggests that waste stores would be cleared out once every five years if and when a centralised repository was established).

[11] September 2008, www.abc.net.au/news/2008-09-22/new-nuclear-waste-site-for-sydney/517372
[12] ARPANSA forum, Adelaide, 26 February 2004, http://web.archive.org/web/20040610143043/http://www.arpansa.gov.au/reposit/nrwr.htm#forum
[13] April 2002, Decision by the CEO of ARPANSA on Application to construct the Replacement Research Reactor at Lucas Heights. Reasons for Decision", p.30.
[14] Application to ARPANSA, 2003, Vol.iii Ch.9 Waste – Transfer and Documentation p.5.

- They must have the institutional capacity to safely manage and store radioactive waste even if waste is periodically removed.

There has been sustained information deficiencies and errors and a lack of clarity regarding existing waste stores. Claims have repeatedly been made that waste stores are inadequate (e.g. hospital car-parks, filing cabinets and basements) to justify remote repository projects. One document released under Freedom of Information states that "none" of the waste "is stored satisfactorily" in existing stores.

Yet industry minister Ian Macfarlane said in September 2014 that current waste stores are "very, very safe".[15]

Likewise, a document released by Senator Nick Minchin, one of the Howard Government ministers responsible for radioactive waste management, stated: "The safety of the storage of radioactive waste is proven by the fact that there are fifty stores around Australia housing radioactive waste and there has never been an accident exposing a person to unsafe levels of radiation." Senator Minchin also said that "waste is already stored in downtown Adelaide in complete safety" and anyone claiming otherwise was trying to "whip up anti-radioactive waste hysteria." By that logic, successive government are guilty of attempting to "whip up anti-radioactive waste hysteria."

It is important to note that even while arguing that existing waste stores are inadequate, successive federal governments have shown no interest whatsoever in upgrading waste stores – including those that will continue storing waste even if an off-site disposal or storage option becomes available.

The following questions (from an environmental NGO) and answers (from the federal Department of Education, Science and Tourism (DEST) in 2003) illustrate the point:

> *Q: "What plans does the federal government have to upgrade stores since the government repeatedly claims that they are unsafe?"*
> *DEST: "This question should be referred to the appropriate state and territory regulators."*
> *Q: "Regarding the storage of radioactive waste in 26 towns and suburbs in SA, what number of these stores will still be storing radioactive waste even if the repository project goes ahead because of ongoing waste production?"*
> *DEST: "This question should be directed to the South Australian Environment Protection Authority or to the operators of the existing stores."*

It makes little sense for the federal government to repeatedly cite the existence of state-based radioactive waste stores as a key reason for advancing a national radioactive waste facility while taking negligible interest in the operation and status of these stores – including those that will continue storing waste even if an off-site facility becomes available.

An important task for an independent National Commission is to determine the state of existing waste stores. Since many scientific and medical institutions continue to produce radioactive waste, they must have adequate waste stores even if an off-site storage or disposal option becomes available. Thus a National Commission should issue recommendations about upgrading waste stores if indeed any are found to be inadequate.

[15] www.sbs.com.au/news/article/2014/09/30/government-searching-nuclear-waste-site-time-runs-out

Another important question for an independent Commission of Inquiry is how many existing waste stores would / would not be cleared out once and for all if an off-site storage or disposal option becomes available and to assess options for decommissioning the historic or legacy sites.

6. Thorough assessment of all management options – LLILW

Successive governments have assumed that deep geological disposal (or deep borehole disposal) is the solution for long-lived intermediate-level waste (LLILW) such as the waste from reprocessing of spent nuclear fuel from research reactors at Lucas Heights. That assumption needs to be tested for the reasons listed in the previous section.

There is not a single deep geological disposal site for high-level nuclear waste anywhere in the world. The only deep geological disposal site in the world − the Waste Isolation Pilot Plant (WIPP) in New Mexico, USA, for long-lived intermediate-level military waste − has been beset by accidents and scandals over the past year.[16]

Despite arguing that Australia's LLILW is destined for deep underground disposal, absolutely no progress is being made towards the establishment of such a facility. Preliminary work was carried out by the National Store Project in the early 2000s, but that preliminary work was terminated in 2004 in favour of a short-lived plan to establish a waste repository on a Pacific island.

Successive governments have pursued (failed) plans to establish an above-ground interim store for LLILW. Among other problems, that strategy raised the spectre of transporting LLILW thousands of kilometres to a store site, and potentially thousands of kilometres again from a store to a deep geological repository if and when such a facility is established.

Because of delays to the plan for a LLW repository and above-ground LLILW store at Muckaty in the NT (now abandoned), in recent years federal governments have advanced plans for interim storage of spent fuel reprocessing waste at Lucas Heights.

Issues for an independent Commission of Inquiry to consider include:

- An accurate, up-to-date inventory of LLILW.
- Whether (overseas) reprocessing of spent nuclear fuel is essential; or whether alternative methods of spent fuel conditioning might be available and preferable; or whether storage might be preferable pending decisions at a later date regarding reprocessing / conditioning / disposal.
- How LLILW should be managed (e.g. on-site storage, deep geological disposal) in the short to medium term and the long term.
- The terms of contracts with France concerning the return of reprocessing wastes including options for extending storage agreements until a suitable storage/disposal site is constructed in Australia, similar to the terms of the UK contract.
- The adequacy of facilities at Lucas Heights for storage of spent fuel, reprocessing waste, and other LLILW.

7. Institutional control of Radioactive Waste

[16] www.wiseinternational.org/node/4067

"It is now widely believed that an important element in establishing public confidence in a particular waste management strategy is the perceived trust and credibility of the implementing organization and of the regulatory authority."
− IAEA 'Radioactive Waste Management: Status and Trends'

An often-ignored aspect of decisions over waste management options is the question of who should have responsibility for waste management. There is an ethical argument that waste producers should manage their own wastes rather than relocating the problem on others. This argument is strengthened since this is likely to lead to waste minimisation and to discourage profligate waste production. Of course, there are many other factors to consider and a Commission would help ensure such issues were appropriately identified and addressed.

Further, the agency capacity and culture of the relevant parties must be considered. In the case of proposals to transfer control of much of the radioactive waste to the Commonwealth Department of Industry, such proposals must consider the poor track record of the Department (and its many predecessors − DRET, DEST, DIST, DISR, DOPIE, etc), and the high degree of stakeholder concern.

The Department had oversight of the failed plans to impose a repository in SA and the NT. The Department's ability to manage the proposed SA nuclear repository project was seriously challenged by nuclear scientists who had first-hand experience of DEST during the Maralinga 'clean-up', including Prof. Peter Johnston (now with ARPANSA) and Alan Parkinson – and by other scientists including ARPANSA inquiry panelists Professor Ian Lowe and Mr. George Jack.[17]

The Department was responsible for the mismanagement of radioactive waste in relation to the 'clean up' of the Maralinga nuclear test site. ARPANSA officer Geoff Williams said in a leaked email that the 'clean-up' was beset by a "host of indiscretions, short-cuts and cover-ups". Nuclear engineer and whistleblower Alan Parkinson said of the 'clean-up': "What was done at Maralinga was a cheap and nasty solution that wouldn't be adopted on white-fellas land." Barely a decade after the 'clean-up', a survey revealed that 19 of the 85 contaminated debris pits had been subject to erosion or subsidence − the half-life of plutonium-239 is 24,100 years.[18]

These issues are rarely considered, yet they are vital to addressing stakeholder confidence and trust – and this is in turn essential to advancing an effective and responsible approach to radioactive waste management. If the Department had an impressive track record of responsible management of radioactive waste projects, it would strengthen the case for centralised storage/disposal under the oversight of the Department. As things stand, the Department's track record significantly weakens the case for centralised management.

Another important issue regarding institutional control is the adequacy of regulation. The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) has been subject to numerous substantive critiques, including critical assessments by the Australian National Audit Office.[19] ARPANSA has a considerable role to play in licensing any future radioactive waste facility and active engagement between the agency and the Commission would strengthen community and stakeholder confidence.

[17] www.foe.org.au/anti-nuclear/issues/oz/britbombs/clean-up
[18] www.foe.org.au/anti-nuclear/issues/oz/britbombs/clean-up
[19] www.foe.org.au/anti-nuclear/issues/oz/arpansa

Potential for conflicts of interest must also be considered. Earlier it was envisaged that ANSTO would be directly involved in the proposed NT repository, yet ANSTO is the main source of radioactive waste destined for any such repository. In such circumstances it is not difficult to envisage scenarios whereby the broad national interest may be subordinated to ANSTO's narrower agency interest e.g. in shifting waste away from its Lucas Heights site.

One final point regarding institutional control. An independent National Commission might consider recommending the establishment of a permanent commission along the lines of the UK Commission on Radioactive Waste Management. In a best-case scenario, such a Commission would provide enhanced competence, continuity and independence and there is a strong case that intractable radioactive waste management debates might best be handled at arms-length from the party-political process.

8: Advancing a Commission

A National Commission would restore procedural and scientific rigour, and stakeholder and community confidence in radioactive waste management. It would identify and evaluate the full suite of radioactive waste management options.

It is beyond the scope of this paper to provide detailed proposals regarding a National Commission, however some relevant issues are briefly discussed here.

Comparable processes overseas − such as the UK Committee on Radioactive Waste Management (CoRWM)[1], and the Blue Ribbon Commission[2] process in the United States − should be considered during the establishment of a National Commission, and by the Commission itself. The strengths of those processes should be incorporated into decision-making processes in Australia, and efforts should be made to avoid potential pitfalls (see section 4 above).

Composition: The panel should comprise people with relevant scientific and environmental expertise. In addition, the composition of the panel should also reflect the fact that there are important social as well as technical dimensions to the problem of radioactive waste management; and in particular it should reflect the importance of protecting the rights of Traditional Owners.

In some respects, previous ARPANSA panels − such as the ARPANSA 2003−04 inquiry into the proposed SA radioactive waste facility − may provide a useful point of reference.

Likewise, comparable overseas commissions provide a point of reference:

- The 15-member US Blue Ribbon Commission included experts from research facilities, academic and policy-centred institutions, industry, labour organisations, and environmental organisations.
- The UK CoRWM has a maximum of 15 members. Their appointments are made on merit and political activity plays no part in the selection process. Any appointees' political activity must be made public. Members are not mandated representatives of organisation or sectoral interests. Relevant skills may include: radioactive waste management; nuclear science;

[1] www.gov.uk/government/organisations/committee-on-radioactive-waste-management
[2] http:/brc.gov

radiation protection; environmental law; environment issues; social science (including public and stakeholder engagement); geology / geochemistry / hydrogeology; finance / economics; civil engineering / underground construction technology; geological disposal facility performance / safety issues; materials science, environmental impact assessment; and local government, planning, regulatory processes and ethics. The CoRWM website further states: "Members of CoRWM itself will not have all the skills and expertise necessary to advise government. The committee will need to decide how best to secure access to other appropriate sources of expert input during the course of its work. Within this, it will have the option of setting up expert sub-groups containing both members of CoRWM itself and other appropriate co-opted persons."

Conversely, the 1993 Research Reactor Review in Australia provides a good example of how to erode credibility and trust. The Keating Labor government appointed a panel of people with known pro-nuclear views, resulting in a major deficit of trust and credibility before the RRR even began its work. Moreover the approach back-fired − panel members turned out to be more inquisitive and sceptical than the government anticipated and they did not deliver the recommendations the government hoped for.

Likewise, ARPANSA's credibility was greatly weakened when the Howard government allowed the head of ANSTO to play a direct role in selecting the founding ARPANSA CEO in the late 1990s.

Principles and objectives guiding the work of a National Commission should include:

- Public health and safety
- Respecting the rights of Australia's Traditional Owners
- Informed community consent
- Environmental sustainability
- Cost−benefit and net benefit principles

Consultation: A National Commission could draw from overseas experience:

- The US Blue Ribbon Commission noted: "We are operating this commission in an open and inclusive manner. In conducting our work, we have heard and will continue to hear from a broad and diverse range of interested parties. We are mindful of the erosion of trust in the federal government's ability to meet its waste clean-up obligations, and we appreciate the advice and guidance on restoring trust that we have received from our invited speakers and through public comment, both at our meetings and through our web site."
- The UK CoRWM states that it aims to undertake its work in an open and consultative manner, to engage with stakeholders and to publish advice (and underpinning evidence) in a way that is meaningful to the non-expert.

Transparency: The UK CoRWM aims to build public confidence by working in an open and transparent manner. It has a published reporting and transparency policy. It aims to make information accessible. It aims to encourage people to ask questions and to make their views known. It aims to provide opportunities for people to challenge information, for example by making clear the sources of information and points of view on which the Committee's advice is based. It holds a number of its meetings in public and publishes minutes of its meetings.

9. A federal action plan for responsible Radioactive Waste management:

The approach to radioactive waste management in Australia has been characterised by contest, uncertainty and delay. Two parallel processes should be initiated to rebuild trust and advance moves towards open and responsible waste management practises. These include a radioactive waste audit and a National Commission or comparable public inquiry mechanism.

The federal government should immediately initiate an audit of existing waste stockpiles and storage. This could be led by ARPANSA in consultation with relevant state agencies with responsibility for radioactive waste. Specific issues include:

- volume/mass and radioactivity of waste at each current storage site;
- whether waste production is ongoing at each particular site and if so, whether storage capacity has been reached or is approaching and if so, whether increasing storage capacity is an option;
- nature and adequacy/inadequacy of current storage conditions;
- nature and adequacy/inadequacy of institutional control.

This audit would include developing a prioritised program to improve continuing waste storage and handling facilities, and identifying non-recurrent or legacy waste sites and exploring options to retire and de-commission these.

- Conduct an audit of existing waste streams, stockpiles and storage. This could be led by ARPANSA in consultation with relevant state agencies with responsibility for radioactive waste. This audit would include developing a prioritised program to improve continuing waste storage and handling facilities and identifying non-recurrent or legacy waste sites and exploring options to retire and de-commission these.
- Move to restore procedural rigour and stakeholder and community confidence in radioactive waste management through adopting a comprehensive and public National Commission to canvass the full suite of management options available to best advance responsible radioactive waste management in Australia.

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