



# Inspection report

<b>Licence holder:</b> Director of National Parks	<b>Licence number:</b> F0093
<b>Location inspected:</b> South Alligator Disposal Facility	<b>Date/s of inspection:</b> 29-30 May 2018
	<b>Report no:</b> R18/06660
<p>An inspection was conducted as part of ARPANSA's baseline inspection program to assess compliance with the <i>Australian Radiation Protection and Nuclear Safety Act 1998</i> (the Act), the Australian Radiation Protection and Nuclear Safety Regulations 1999 (the Regulations), and conditions of Facility Licence F0093.</p> <p>The scope of the inspection included an assessment of Director of National Parks' (Parks) performance at the South Alligator Disposal Facility against the Facility Performance Objectives and Criteria (PO&amp;Cs). The inspection consisted of a review of records, interviews and physical inspection of the facility.</p> <h2>Background</h2> <p>Uranium mining was conducted in the South Alligator River Region in the late 1950s and 1960s. Approximately 875 tonnes of U<sub>3</sub>O<sub>8</sub> was produced from 13 mines. These sites were abandoned at the end of mining without any attempt at remediation. A hazard reduction program was conducted in 1990/1991 and an intervention<sup>1</sup> conducted in 2009. This involved the construction of a near surface disposal facility and the relocation of low level naturally occurring radioactive material into this containment facility. This was undertaken by the Commonwealth Government in an agreement with the traditional land owners.</p> <p>Licence conditions on Facility Licence F0093 require the Director of National Parks to monitor the environment surrounding the facility to ensure there is negligible release of radioactive materials from the facility.</p>	

<sup>1</sup> The International Commission on Radiological Protection (ICRP) previously defined two broad classes of situations involving radiation. These were practices and interventions. Practices were defined as 'human actions increasing exposure either by introducing whole new blocks of sources, pathways, and individuals, or by modifying the network of pathways from existing sources to individuals and thus increasing the exposure of individuals or the number of individuals so exposed'. Interventions were defined as 'human actions that decrease the overall exposure by influencing the existing form of the network. These activities may remove existing sources, modify pathways or reduce the number of exposed individuals'. The ICRP updated the system of protection in 2007, and three types of exposure situations (i.e. planned, existing and emergency) was introduced. Within the new system, existing exposure situations most closely resembles what was previously known as an intervention.

The main codes and standards applicable to this facility are:

- Code for Radiation Protection in Planned Exposure Situations (2016) (RPS C-1)<sup>2</sup>
- Code of practice for the near-surface disposal of radioactive waste in Australia (1992) (RHS 35)

## Observations

### Performance reporting and verification

Parks is required to report to ARPANSA on an annual basis. The content of these reports is generated by two companies which have been contracted to collect technical data based upon the sensors and monitoring equipment installed at the site. In conjunction with this further inspections are conducted by the Supervising Scientist Branch (SSB) of the Department of Environment and Energy which carries out inspections of the site under the Environment Protection (Alligator Rivers Region) Act 1978. All inspections result in reports that are regularly provided to the Director of National Parks. These reports provide the technical content to assure ARPANSA that the facility is performing to an adequate level of safety.

### Configuration management

International best practice in radioactive waste management utilises the concepts of safety assessment and safety case in assessing, documenting and demonstrating that waste disposal facilities can be operated safely. These documents are used by the organisation operating the facility, the regulator and the public and forms vital reference material in maintaining knowledge of the design, and at a later date, performance of the facility. When the intervention was conducted in 2009, a consultant provided Parks with a plan and design for the containment facility. This information was used by Parks to obtain a licence for the containment facility. However prior to, and on the day of the inspection, the licence holder's representative was unable to provide any updated documentation reflecting the current status of the facility as it has evolved over time as a result of environmental influences (e.g. rainfall and bushfire). A safety assessment for the facility should exist. This should be a living document that reflects the current status of the facility. It should include the facility description, results of the risk assessment including hazards and mitigating measures, details of the conduct of operation, security arrangements, facility performance monitoring system, environment monitoring system, methods used for data analysis and their results, and the relevant historical records.

Regulation 49 requires that the licence holder take all reasonably practicable steps to manage safety, this includes having the plans and arrangements mentioned in item 4 of the table in clause 1 of Schedule 3 of the Regulations. However, the licence holder's representative was unable to provide this documentation.

The licence holder uses a suite of operating procedures for the main business activities associated with running the park. An operating procedure describing the access arrangements and safety precautions to be followed when entering the facility was not available at the time of the inspection, but was provided at a later date. This document was less than three years old.

### Inspection testing and maintenance

The facility was designed and constructed with monitoring stations consisting of numerous sensors. These included a weather monitoring station, three soil monitoring stations and two tipping bucket stations to record the rainfall on the facility. These two tipping bucket stations are located down gradient on the slope away from the containment cap. The previous ARPANSA inspection in 2015 observed that the plastic water collection inlets to the stations had been damaged in a previous bushfire. In the

meantime the plastic had been replaced by Teflon sheets which is more resistant to deformation at the high temperatures that would occur during a bushfire. The vicinity of the stations was clear of dry vegetation and the tipping buckets themselves were operable even though a small amount of debris was present.

The service providers that collect technical data and inspect the facility provide reports to Parks. These reports commonly contain recommendations to improve the facility, repair components and perform works to return the facility to its original design specification. It was demonstrated that many of the recommendations have been implemented. However there is no formal register of the recommendations, no schedule for when recommendations will be implemented and no record of reasons why some of the recommendations have not been implemented. For example, it was reported in the Monitoring Data Summary Report dated June 2017, that surface depressions around the monitoring stations had resulted in water pooling in these areas. This would consequently affect the volume of water seeping into the clay layer, and possibly the waste material. However this had not been repaired and there was no record of reasoning behind this.

## Training

The personnel within Parks with responsibility for the day-to-day management of the facility has changed a few times since the facility was created in 2009. The most recent personnel had only been in the role for a number of months. There had been no training in radiation protection and no hand-over from the previous responsible officer. Having no operational procedure and no safety documents to fall back on, the responsible officer relied solely on the data presented in the contractors' technical reports. This is not considered to be adequate knowledge management and if it continues may introduce vulnerabilities in the future management of the facility.

## Event protection

The facility was designed to incorporate a 2 metre thick growth medium. This plays an important role in limiting the effects of erosion on the facility. This was initially designed to consist of native vegetation similar to that found in adjacent undisturbed areas. However the previous ARPANSA inspection in 2015 observed that there had been a significant invasion of annual mission grass on the containment. This has a higher fire loading than native species. This has decreased since 2015, but a relatively small patch of dry grass and low bush was found to remain near the northeast corner of the containment facility. Generally the top of the containment facility and the nearby vicinity were free of significant dry vegetation and bearing evidence of a recent controlled burn off. It is anticipated to be an ongoing challenge to vegetate the growth medium with enough native plants in order to fulfil the design objective and limit erosion to the cap on the containment.

## Security

The licence holder reported no safety or security incidents since the last ARPANSA inspection. The visit to the site showed no signs of any unauthorised access to the facility.

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<sup>2</sup> Although, the facility was constructed in 2009 as part of an intervention (i.e. remediation of an existing exposure situation), it was designed and constructed to the relatively modern safety standards that existed at the time. This included the Code of practice for the near-surface disposal of radioactive waste in Australia. Hence, ARPANSA has formed the preliminary position that the facility can be treated as a planned exposure situation. Hence, the application of the Code for Radiation Protection in Planned Exposure Situations in this instance.

## Radiation protection

Parks workers do not wear personal dosimetry. Their doses are estimated from the external gamma dose rate and radon activity flux density measurements performed by the SSB on a biennial basis. These measurements are also used to estimate the doses that may be received by the public. The doses to both groups are less than 30  $\mu\text{Sv}/\text{annum}$ .

## Emergency preparedness and response

As identified above, the licence holder was unable to provide plans and arrangements. As such it was not possible to assess the adequacy of the emergency plans for the facility.

## Findings

The inspection revealed the following potential non-compliance/s:

1. Failure to take all reasonably practicable steps to manage the safety of the facility.

The inspection revealed the following **areas for improvement**:

1. Development of a system to manage recommendations provided by service providers.
2. Knowledge management of the technical aspects of the facility.

It is expected that improvement actions be taken in a timely manner.