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Little Forest Legacy Site Licence Application

Document LFBG-PC-LA-SUM

LITTLE FOREST LEGACY SITE ‘POSSESS OR CONTROL’ LICENCE

SUMMARY OF THE LICENCE APPLICATION

(rev 0)

Prepared By

Australian Nuclear Science and Technology Organisation

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0	Original issue	Alamgir Kabir	Simon Bastin	Hefin Griffiths
1	Facility name changed to LFLS. Revised to reflect changes made in other documents including the safety assessment.	Alamgir Kabir 29/8/14	Simon Bastin 29/8/14	Hefin Griffiths 29/8/14.

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1 PURPOSE AND SCOPE

This document provides a brief summary of the additional information package supplied to support the licence application submitted to the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) for the Little Forest Legacy Site (LFLS). This additional information also clarifies that ANSTO is seeking a 'Possess or Control' Licence under the provisions of Section 30 (1) (c) of the ARPANS Act 1998 [1] and Regulation 39 of the ARPANS Regulations 1999 [2]. This document is prepared in accordance with the guidance provided in the ARPANSA regulatory guide for radioactive waste storage and disposal [3].

2 THE SITE

LFLS is located in bushland approximately 1.6 km north of the Lucas Heights Science and Technology Centre (LHSTC) within the buffer zone of ANSTO. The site was formerly known as Little Forest Burial Ground. During the period 1960-1968, the site was operated by the then Australian Atomic Energy Commission (AAEC) and was used to dispose of solid radioactive waste, some liquid wastes and beryllium/beryllium oxide waste. In accordance with internationally accepted practice at the time, seventy seven (77) shallow trenches were excavated into the weathered shale clay soil and about 1600 m^3 of waste was disposed of into the trenches.

The facility was closed in 1968 and no further wastes were added to the site. Since then, international practice in radioactive waste disposal has evolved significantly, and disposal of such wastes in this way is no longer considered appropriate.

The approximate dimension of each trench was 25 m long x 0.6 m wide x 3 m deep, spaced at intervals of about 2.7 m. The waste was buried under 1 m of consolidated top soil. The quantities of radioactive materials and beryllium-contaminated items buried at LFLS are given in the LFLS site description document [4] which is submitted as part of this licence application.

LFLS is maintained by ANSTO on an ongoing basis, including monitoring, surveillance, mowing, top dressing and fence repair as necessary. Extensive monitoring is carried out of groundwater, airborne particulates, soil and sediment samples, surface water samples and radiation levels.

To facilitate this monitoring the LFLS site has various monitoring devices and services, e.g. environmental radiation dosimeters, and boreholes. There are several sets of boreholes to collect ground water samples in and around the site. Airborne particulate monitors and gamma monitors are also deployed at the site. Surface water and sediment samples from local creeks are collected routinely.

To date this on-going monitoring, as well as independent assessments, has concluded the site is safe. Results from this monitoring are freely available and are published in ANSTO's Environmental and Effluent Monitoring Reports.

Further details of the monitoring program are provided in the *Safe Storage and Maintenance Arrangements* [5].

3 THE ADDITIONAL INFORMATION PACKAGE

The following documents form the additional information package in support of the Application seeking a 'Possess or Control' authorisation in accordance with the Schedule 3 of the ARPANS Regulations 1999 [2]. Note that at the time of the original application, the forms and templates for these documents did not exist and so the additional information and clarification is provided on the current form.

(a) ARPANSA Licence Application Form for LFLS

(b) LFLS Effective Control Plan, Document No. LFBG-PC-LA-D1

(c) LFLS Safety Management Plan, Document No. LFBG-PC-LA-D2

(d) LFLS Radiation Protection Plan Document No. LFBG-PC-LA-D3

(e) LFLS waste Management Plan Document No. LFBG-PC-LA-D4

(f) LFLS Security Plan Document No. LFBG-PC-LA-D5

(g) LFLS Emergency Plan Document No. LFBG-PC-LA-D6

(h) Safety Assessment of the LFLS, ANSTO/T/TN/2013-10

(i) Purpose and Description of the Facility, Document No. LFBG-PC-LA-FD.

(j) Safe Storage and Maintenance Arrangement of LFLS, Document No. LFBG-PC-LA-SS

4 SAFETY ISSUES AND ASSESSMENT RESULTS

In the late 1950s and 1960s, it was international practice to use earth trenches to dispose of low-level solid and liquid wastes. The LFLS was selected by the former Australian Atomic Energy Commission (AAEC) at that time for the purpose of disposing of such wastes in accordance with that international practice..

ANSTO is supplying additional information in support of the licence application submitted some time ago. This additional information also clarifies that ANSTO is seeking an authorisation to possess or control the site.

Part of this additional information is a safety assessment for the purposes of justifying that the site can be managed safely in the short to medium term under a 'possess or control' licence.

The safety assessment was undertaken using an internationally accepted method, namely Features, Events and Processes (FEP) analysis, which was applied to examine various potential hazardous scenarios associated with the wastes. However, given that this site is a legacy one, ANSTO considers that the site can never lose institutional control in its current state, and so the consideration of FEPs was specifically limited to scenarios where institutional control remained*.

A risk assessment of the hazardous scenarios was performed using the ANSTO risk assessment guide.

There were no radiological fault sequences whose consequences were assessed to be **major** or more severe, or where doses to members of the public could exceed 1 mSv. Additionally, the risk assessment of two scenarios involving Pu-239/Am-241 contamination, which was undertaken quantitatively, showed that the consequences of those scenarios were **minor** or **negligible**. All other fault sequences were assessed semi-quantitatively using engineering judgement: no formal assessment of frequency or consequence was undertaken for those sequences.

The study identified that the resuspension of radionuclides (i.e. Pu-239 and Am-241) in the air could cause an internal radiation hazard which would pose **low** or **very low** risk to the public (e.g. bike riders) and to the worker who mows the grass at the LFLS. The study also found that the risk of environmental damage due to the migration of radionuclides into the environment is **very low.** The risk assessment report identified that the Safe Storage and Maintenance Arrangements [5] for LFLS is adequate to minimise these risks further during the 'possess or control' phase of the site. Other safety issues such as bush fire and toxicity of beryllium are also discussed in the report.

The risks considered in the safety assessment report were assessed taking into account the existing administrative controls and safeguards exercised by ANSTO staff. It is expected that the safety of the site during the 'possess or control' period would be further improved with the satisfactory implementation of the short and medium-term plans identified in the Safe Storage and Maintenance Arrangements.

5 FUTURE PLANS – DISCUSSIONS

ANSTO is committed to the following management plan in the short, medium and long term. The long term management plan will depend on the results of the findings of the medium term investigations.

a) Short Term Management Plan (approx. 3 years)

* For disposal sites, the FEPs are normally expected to include scenarios well into the future where institutional control may have been lost, and so mitigative controls cannot be applied.

- Maintain current monitoring and maintenance
- Continuation of the current research project by the Institute of Environmental Research (IER)
- Prepare a communications strategy
- Update ARPANSA on current status, findings of research and discuss licencing strategy

b) Medium Term Plan

Undertake an engineering assessment to implement measures to prevent water entry to the trenches and improve the stability of the trenches.

c) Long Term Management Plan

The medium-term plan, as stated above, will extend to the point where a final determination has been made as to the disposition of the LFLS and the material contained therein...

6 REFERENCES

1 Australian Radiation Protection and Nuclear Safety (ARPANS) Act 1998.

2 Australian Radiation Protection and Nuclear Safety (ARPANS) Regulations 1999.

3 Australian Radiation Protection and Nuclear Safety Agency, Regulatory Guide: Licensing of Radioactive Waste Storage and Disposal Facilities v2, OS-LA-SUP-240L, March 2003.

4 ANSTO, Little Forest Legacy Site -Purpose and Description of the Facility, Document No. LFBF-PC-LA-FD, November 2013.

5 Safe Storage and Maintenance Arrangements, Document No. LFBG-PC-LA-SS.