Classification: OPEN

South African Nuclear Energy Corporation SOC Limited

Document No.	**NLM-PLN-00652**
Rev. No.	**00**
Department/Section:	**In-Service & Maintenance Support**
Title:	**WASTE MANAGEMENT PLAN FOR THE CLOSING AND SEALING OF CaF2 POND 4**

Authorization

	NAME	SIGNED
PREPARED	TE LABUSCHAGNE **(Chief Technician: WM)**	Signed by Theo Labuschagne, theo.labuschagne@necsa.co.za 16/04/2025 08:45:21(UTC+02:00) SIGNIFLOW
REVIEWED	M VAN ZYL **(Snr Technician: WM QA)**	Signed by Maria Maryna van Zyl, marietjie.vanzyl@necsa.co.za 16/04/2025 09:11:54(UTC+02:00) SIGNIFLOW
REVIEWED	LS DLAMINI **(Senior Technician: WM)**	Signed by Siyabonga Dlamini, siyabonga.dlamini@necsa.co.za 16/04/2025 09:25:44(UTC+02:00) SIGNIFLOW
REVIEWED	AR DAVIDS **(Supervisor RPO: PDO)**	Signed by Wally Davids, wally.davids@necsa.co.za 16/04/2025 17:03:27(UTC+02:00) SIGNIFLOW
ACCEPTED	E VAN HEERDEN (**Section Head : EMG: SHEQ)**	Signed by Eurika van Heerden, eurika.vanheerden@necsa.co.za 16/04/2025 17:05:07(UTC+02:00) SIGNIFLOW
ACCEPTED	MM THABALALA **(Scientist: Necsa Independent Contractor)**	Signed by Makgobe Matshediso Tshabalala, makgobe.tshabalala@necsa.co.za 16/04/2025 18:50:08(UTC+02:00) SIGNIFLOW
APPROVED	HJ SHILENGE **(Manager: PDO)**	Signed by Hlengani Shilenge, hlengani.shilenge@necsa.co.za 16/04/2025 19:57:45(UTC+02:00) SIGNIFLOW

Distribution list:

NO.	NAME	NO.	NAME	NO.	NAME
1	NLM QA RECORDS	7	M THEMBA*	13	HJ SHILENGE*
2	CJE DE JAGER*	8	NO RAMAILA*	14	ET LAYTE*
3	E VAN HEERDEN*	9	ES TSHABALALA*	15	TE LABUSCHAGNE*
4	RGF ROBBERTS*	10	MM THABALALA*	16	
5	AR DAVIDS*	11	LS DLAMINI*	17	
6	MA APHANE*	12	KK LETHUBA*	18	

*= Distributed via E-mail

Revisions

This document has been revised according to the following schedule:

Revision	Date Approved	Nature of Revision	Prepared by
00	See title page	First Issue	TE Labuschagne

Contents:

1.0 PURPOSE

The purpose of this document is to describe the waste management plan for the waste that will be generated as a result of the capping process of CaF_2 Pond 4 as prescribed in [1].

2.0 SCOPE

This document will cover the radiological clearance, removal and temporary storage of waste generated during the construction phase of the capping process of CaF_2 Pond 4.

3.0 REFERENCES

[1]. NLM-PRO-00182:	Capping Procedure for the Closing and Sealing of CaF2 pond4
[2]. NLM-PRG-031:	Solid Waste Management Program for Predisposal Operations
[3]. NLM-WAR-004:	Waste Acceptance Requirements for solid radioactive waste.
[4]. NLM-SUR-005	Rp Surveillance and Control Programme for Thabana Complex (Stores 1 to 5, The Thabana Pipestore,Thabana trenches and the CaF2 Ponds)

4.0 DEFINITIONS AND ABBREVIATIONS

4.1 DEFINITIONS

Capping: A process of the closing and sealing a pond to isolate the contents of the pond from the environment.

4.2 ABBREVIATIONS

CaF2	Calcium Fluoride
EMG	Environmental Management Group
HDPE	High Density Polyethylene
PDO	Pre-disposal Operations a section of WM
PPC	Personal Protective Clothing
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride
QA	Quality Assurance
RPO	Radiation Protection Officer
SHEQ	Safety, Health, Environment and Quality
WAR	Waste Acceptance Requirement
WM	Waste Management

5.0 INTRODUCTION

CaF_2 pond 4 is an open-air evaporation pond that contains chemicals and uranium-contaminated effluent where the aqueous part of the effluent is evaporated by natural processes. However, the degradation of the lining of the pond (mainly due to prolonged exposure to sun and ultraviolet rays, wind and temperature

differences) and the sporadic exposure of the top of the sludge during dry seasons has increased the risk of contamination to the environment from this pond.

The project will include the closing and sealing of the HDPE lined pond with sand and new HDPE liners, to isolate the sludge from the environment and rain water.

The activities include:

1. The removal of a steel bridge leading to a concrete sump structure inside the pond.
2. The partially dismantling of the sump structure.
3. The covering of the sludge and the HDPE liners inside the pond with sand and soil on different intervals.
4. The instalment of the drain system inside the pond with an associated drain system to the outside of the pond.

The surrounding areas around the pond are classified as a white contamination area and inside the pond a blue contamination area.

6.0 RESPONSIBILITY

1. It is the responsibility of the project leader to ensure that the requirements and instructions as specified in this document are adhered to.
2. Dedicated demarcated area's for all waste associated with rubble and secondary waste generated in the dismantling and construction process will be allocated by the PDO personnel for temporally storage during construction.
3. The facility RPO is responsible for the clearance of waste.
4. PDO personnel shall be responsible for the handling and package of the contaminated solid waste and to ensure compliance to PDO's WAR [3].

7.0 EXPECTED WASTE TO BE GENERATED

Note: All, dirt and rubble currently in the pond will stay in the pond and covered with the layer of sand as prescribed in [1] - Paragraph 8.2.

1. Metal waste generated during the dismantling of the steel bridge (e.g. handrails, support beams, grids and removed bolts and nuts).
2. Possible concrete offcuts from the pre-cast culvert used for the installation of the drainage system.
3. Concrete rubble, reinforcing steel and steel valves generated during the partial dismantling of the concrete sump structure.
4. Possible contaminated soil generated during the installation of the drainage system.
5. HDPE liner offcuts during the installation of the water drainage system and the new HDPE liners.
6. Personal Protective Equipment, paper, cloths, plastic that will be generated during the dismantling and construction process.

8.0 STRATEGY AND WASTE MANAGEMENT PLAN

8.1 STRATEGY

- PDO strategy is to minimize radioactive waste by the segregating of contaminated from non-contaminated material/waste and the releasing of the clearable waste thereafter as prescribed in [2].
- The waste will consist mostly of steel, soil, concrete rubble and disposable PPC and PPE.
- Sign posting shall be in accordance with the requirements specified in [2].
- All waste will be monitored for contamination. Any radiologically contaminated waste will be handled according to the requirements as stipulated in [2].
- All radioactive waste generated shall be controlled in accordance to [3].

8.2 WASTE MANAGEMENT

The below table shows the waste type to be generated, estimated amount and the management approach.

Waste type generated	**Estimated amount of waste to be generated**	**Management approach (disposal, recycling etc.)**
Metal waste: (e.g. hand rails, support beams, grids, reinforcing rods, valves and removed bolts and nuts)	± 1500Kg	1. Contaminated metal will be decontaminated if possible <u>If not possible:</u> 2. Contaminated metal will be handled according to [2]. 3. Uncontaminated metal will be recycled internally at Necsa or disposed of at Necsa's scrap yard.
Concrete rubble	± 4 m^3	1. Contaminated concrete debris will be handled according to [2]. 2. Uncontaminated concrete to be used as part of the construction of the water control system to the environment.
Loose soil generated during the digging of the trench for the drain water system through the wall.	± 10m^3	1. Excess contaminated loose soil generated during the digging of the trench at the outlet of the water drain system at the lower end of the wall inside the pond shall be handled according to [2] 2. Excess loose soil generated during the digging of the trench outside

		the pond needs to be spread evenly on the area next to the new drain water trench.
HDPE liner offcuts.	± 0.5m³	1. Contaminated HDPE liner offcuts will be handled according to [2]. 2. Uncontaminated HDPE liner offcuts will be disposed of at Necsa's scrap yard or can be removed by the installation contractors.
Compressible waste: PPE, paper, cloths, plastic sheeting etc.	To be determined during construction	Placed inside 160L red drums and handled according to [2].

9.0 RECORDS

The documentation pertaining to the radioactive waste and the results of the tests, checks and inspections carried out shall be retained as quality records at PDO as prescribed in [3].