

Trawsfynydd Site: Application to Natural Resources Wales for on-site disposal of solid radioactive waste (Ponds Complex structures and other minor structures):

Non-technical summary of proposal

Magnox Ltd¹ is presenting proposals for the demolition, infilling, and capping of the Trawsfynydd “Ponds Complex” (PC). This is a set of relatively low-profile buildings about 230 metres in length, situated between the two reactor buildings and the intermediate level waste (ILW) storage building (Figure 1). The central structures of the PC are the concrete cooling ponds formerly used for cooling and interim storage of used nuclear fuel before being sent to Sellafield in Cumbria for reprocessing (an operation completed in 1997). The cooling ponds and adjoining radioactive waste storage vaults have box-like below-ground structures with voids between three and six metres deep (Figure 2), with a total void volume of about 5,000 cubic metres (twice the volume of an Olympic-sized swimming pool). During the late 1990s and 2000s, the cooling ponds were drained and much of the contamination on their internal wall and floor surfaces was shaved off and disposed of off-site as low level radioactive waste.

The planned demolition of the above-ground concrete structures of the Ponds Complex will result in a volume of slightly radioactive mainly broken concrete approximately equal to the volume of voids to be infilled. Infilling the voids in this way will be regulated by Natural Resources Wales as a type of on-site disposal of solid radioactive waste termed “disposal for a purpose”. In addition, leaving radioactively contaminated structures in the ground will also be a type of on-site radioactive waste disposal (termed “in situ disposal”). This applies not only to ground-level and below-ground radioactive parts of the Ponds Complex but also to redundant below-ground radioactively contaminated pipes, manholes, etc. outside the footprint of the Ponds Complex. The area encompassing all the proposed on-site disposals is termed the “Disposal Area” (shown in Figure 3).

Plans for the timing of demolition of the Ponds Complex are still being refined as part of the overall site decommissioning programme. The work is currently thought likely to commence around 2030 and take one to two years to complete.

Regulatory permissions will be required for the proposed on-site disposals, including a variation (amendment) to the site’s existing Environmental Permit granted by National Resources Wales (NRW) under the Environmental Permitting (England and Wales) Regulations 2016. This non-technical summary relates to that particular application, submitted in December 2023.

Before granting such permission, NRW will need to be satisfied that the proposed on-site disposals will not prevent the site as a whole from being released from regulatory control after all decommissioning work at the site is completed in several decades’ time. Guidance from NRW and other UK environment agencies² states “*Our **fundamental protection objective** is to ensure that a nuclear site is brought to a condition at which it can be released from radioactive substances regulation, through a process which protects the health and interests of people and the integrity of the environment, both during the period of regulation and afterwards, and which inspires public confidence and takes account of costs*”. To address this objective, NRS/Magnox Ltd is submitting to NRW a “site-wide environmental safety case”, supported by over 30 technical reports. This includes current cautious³ estimates of the amounts of radioactivity in the proposed disposals, the rationale behind the design of the proposals, and assessments of potential impacts of the proposed disposals

¹ As of December 2023, the operator of the Trawsfynydd site is Magnox Ltd, which (since 31 October 2023) has been re-branded as Nuclear Restoration Services (NRS) and is a wholly owned subsidiary of the Nuclear Decommissioning Authority (NDA), which owns the site. NRS (Magnox Ltd) is responsible for safely decommissioning the first-generation nuclear power and research sites across the UK.

² Scottish Environment Protection Agency, Environment Agency and Natural Resources Wales. “[Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation](#)” [with [Non-Technical Summary](#)], July 2018 (on www.sepa.org.uk)

³ Here “cautious” means erring towards over-estimating rather than under-estimating the amount of radioactivity present, where sufficient measurements have not yet been made (but will be before demolition).

on people and the environment, extending from the near term into the far future. Overall, the site-wide environmental safety case demonstrates that the “fundamental protection objective” quoted above will be met, and in particular that NRW’s quantitative guidance levels for impacts from radioactivity will not be exceeded and that regulatory objectives for protection of groundwater will be met. In short, the proposed disposals will be safe, while they are being implemented, for the decades while the site remains under regulatory control and then afterwards into the indefinite future.

Estimates of the amounts of radioactivity in the proposed disposals are expected to decrease in the next few years, before implementation of the disposals. This is because, as further decommissioning work within the Ponds Complex progresses it will become possible to measure the actual remaining levels of radioactivity on the surfaces of structures that are currently inaccessible or awaiting further planned decontamination.

During 2024 there will also be some additional borehole investigations of groundwater beneath the site, to refine understanding of certain aspects of how groundwater flows around, beneath and beyond the Ponds Complex structures.

As well as the environmental permit variation application to NRW, NRS/Magnox Ltd will have to submit an application for planning permission to Eryri/Snowdonia National Park Authority, which will be supported by an Environmental Statement (containing an environmental impact assessment) and by a Health Impact Assessment. The planning application documentation will be made public and will include a non-technical summary of the environmental impact assessment.

The demolition of the Ponds Complex is just one of several major operations in the multi-decade programme of works to fully decommission the Trawsfynydd site. A summary of the currently envisaged forward programme is set out in the Site Development Plan that also accompanies this application to National Resources Wales.



Figure 1 – Aerial view of the site showing the location of the Ponds Complex (in red)

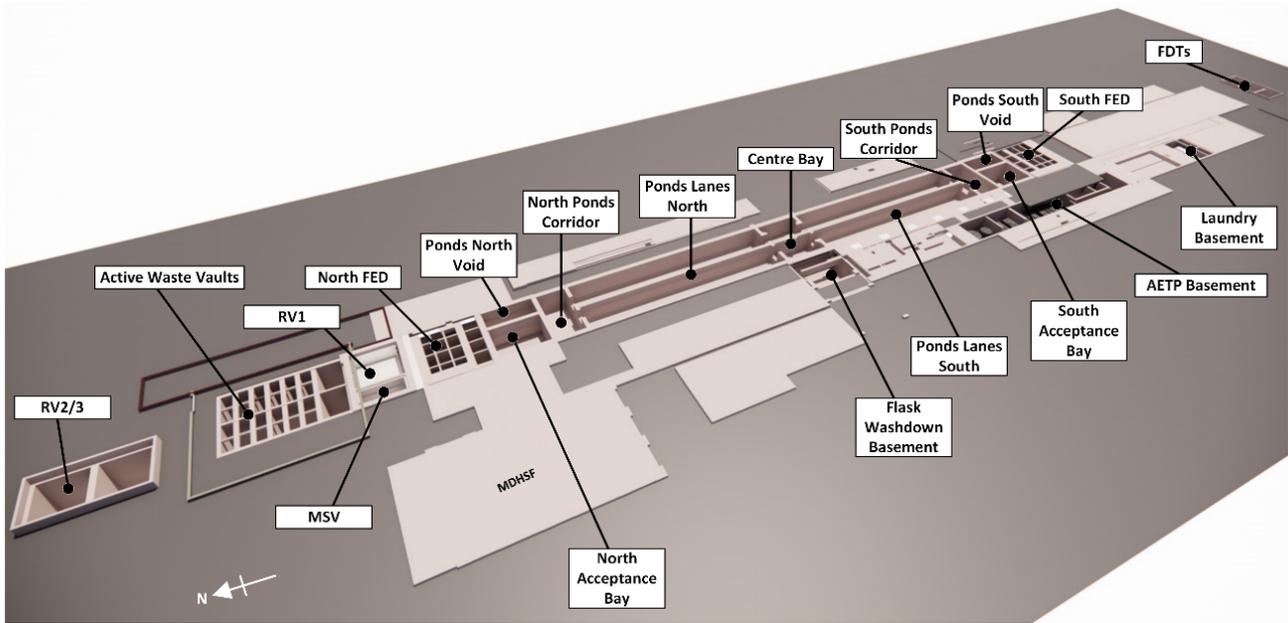


Figure 2 – Oblique 3D view of the void spaces within the Ponds Complex

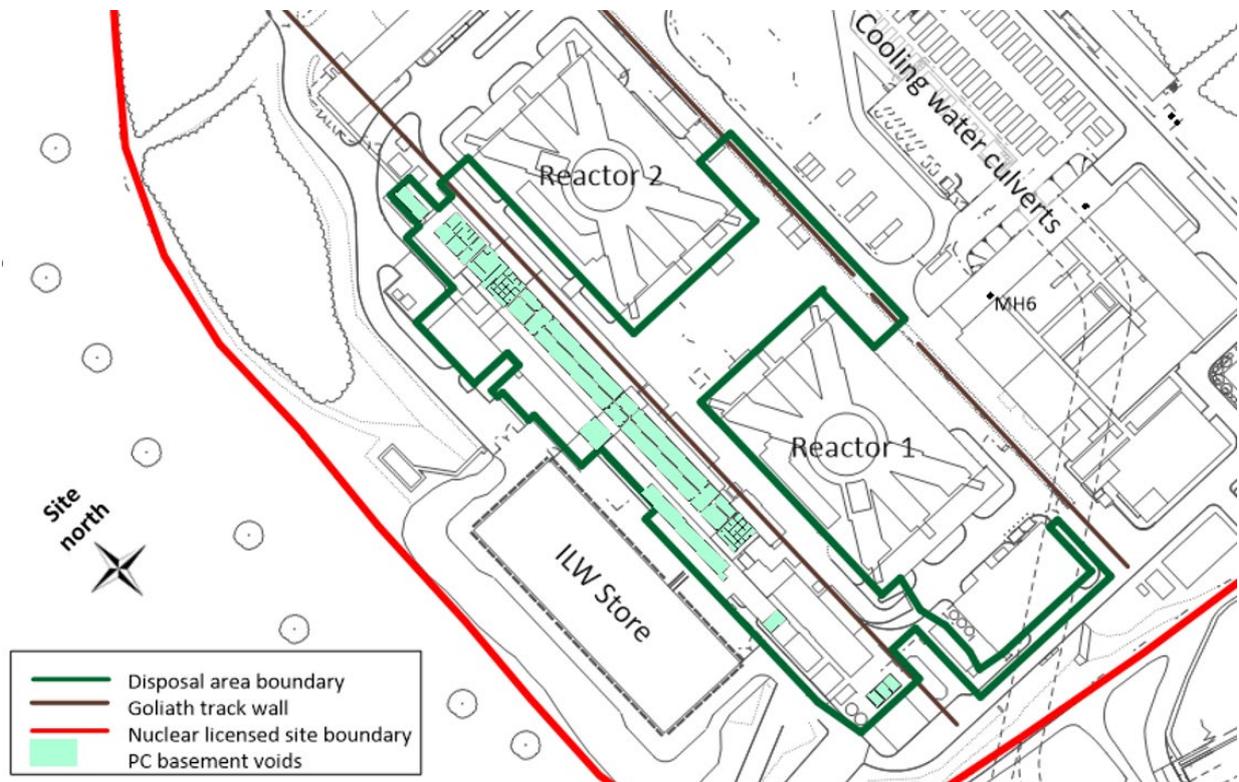


Figure 3 – Locations of the Disposal Area and Ponds Complex (PC) basement voids