Nuclear Restoration Services (NRS)

ENVIRONMENTAL STATEMENT

Trawsfynydd site: Demolition of the ponds complex to ground slab level, infilling of its below-ground voids, capping of its footprint, and modifications to the surface water drainage.

Trawsfynydd Nuclear Power Station, Blaenau Ffestiniog, LL41 4DT

Contents

PART 1

1. Introduction

1.1 The Applicant

1.1.1 The Applicant is Nuclear Restoration Services Limited[1] (NRS), hereinafter referred to as "the Applicant". The Applicant is a nuclear site licence holder as defined in the Nuclear Installations Act 1965[2]. The Applicant is a wholly owned subsidiary of the Nuclear Decommissioning Authority (NDA), who own the Trawsfynydd site. On behalf of the Nuclear Decommissioning Authority, the Applicant is responsible for the general management of, and all operations at, a fleet of nuclear sites including Trawsfynydd.

1.2 Overview of the Proposed Development

1.2.1 The Applicant carries out the decommissioning and waste management processes at the Trawsfynydd Nuclear Licensed Site (NLS). Decommissioning involves the systematic removal and management of plant, buildings and waste previously associated with electricity generation and subsequent operations.

1.2.2 This Environmental Statement (ES) has been prepared, in accordance with the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017[3], to accompany a full planning application for the following works (collectively referred to as the 'Proposed Development'):

i. The demolition of the Trawsfynydd NLS ponds complex;

ii. The infilling of its below-ground voids of the ponds complex, mainly with radioactively contaminated demolition arisings, and the permanent retention of the infill (which, in environmental permitting terms, is the disposal of radioactive waste);

iii. The permanent retention of the radioactively contaminated residual below-ground structures of and around the ponds complex (which, in environmental permitting terms, also involves the disposal of radioactive waste) within the 'Disposal Area' (**Graphic 1.1**);

iv. The capping of its footprint of the former ponds complex with a concrete cap; and

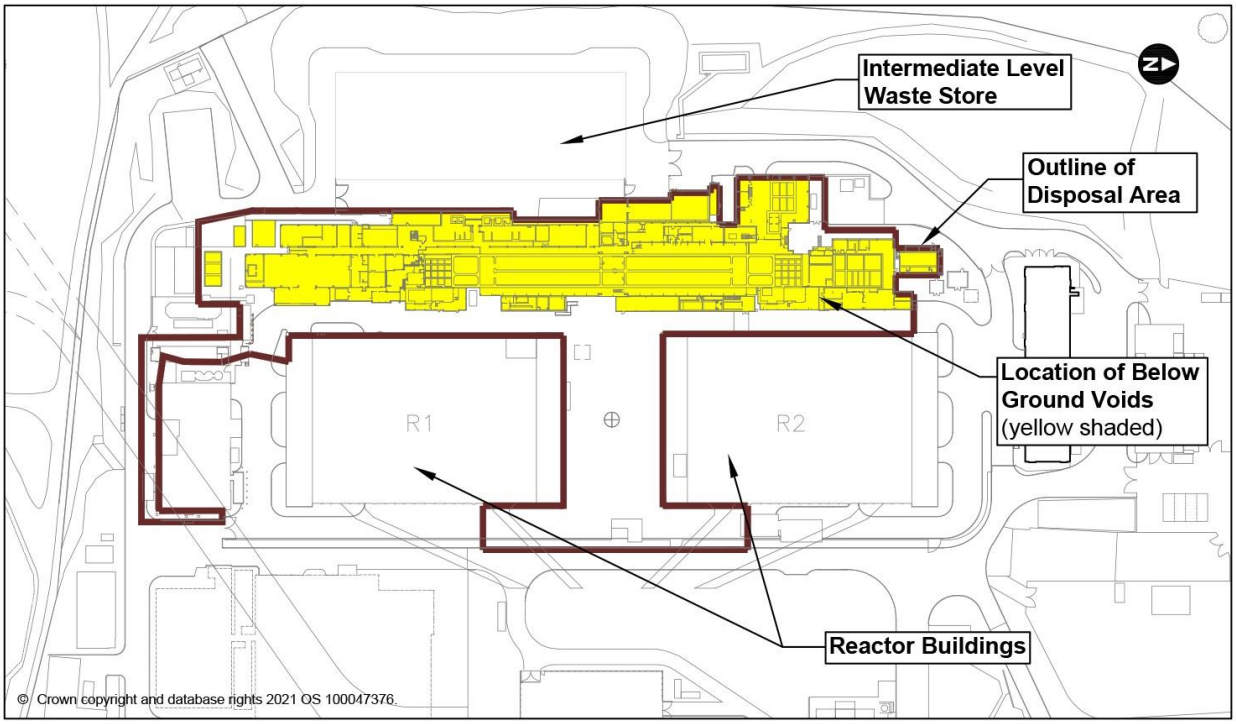
v. Modifications to the local drainage on and around the concrete cap.

[1] Prior to the renaming of Nuclear Restoration Services Limited on the 2nd April 2024 the Company was named Magnox Limited.

[2] UK Government (1965). Nuclear Installations Act 1965 [online]. Available at: Nuclear Installations Act 1965 (legislation.gov.uk) [Accessed March 2024].

[3] UK Government (2017). The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017. [online] Available at: https://www.legislation.gov.uk/wsi/2017/567/contents [Accessed March 2024]

1.2.3 The permanent retention aspects of ii and iii above are referred to later in this document as “on site disposal”. Retaining structures (iii) is also referred to as “in situ disposal”, whereas infilling voids (ii) is also referred to as “disposal for a purpose”.

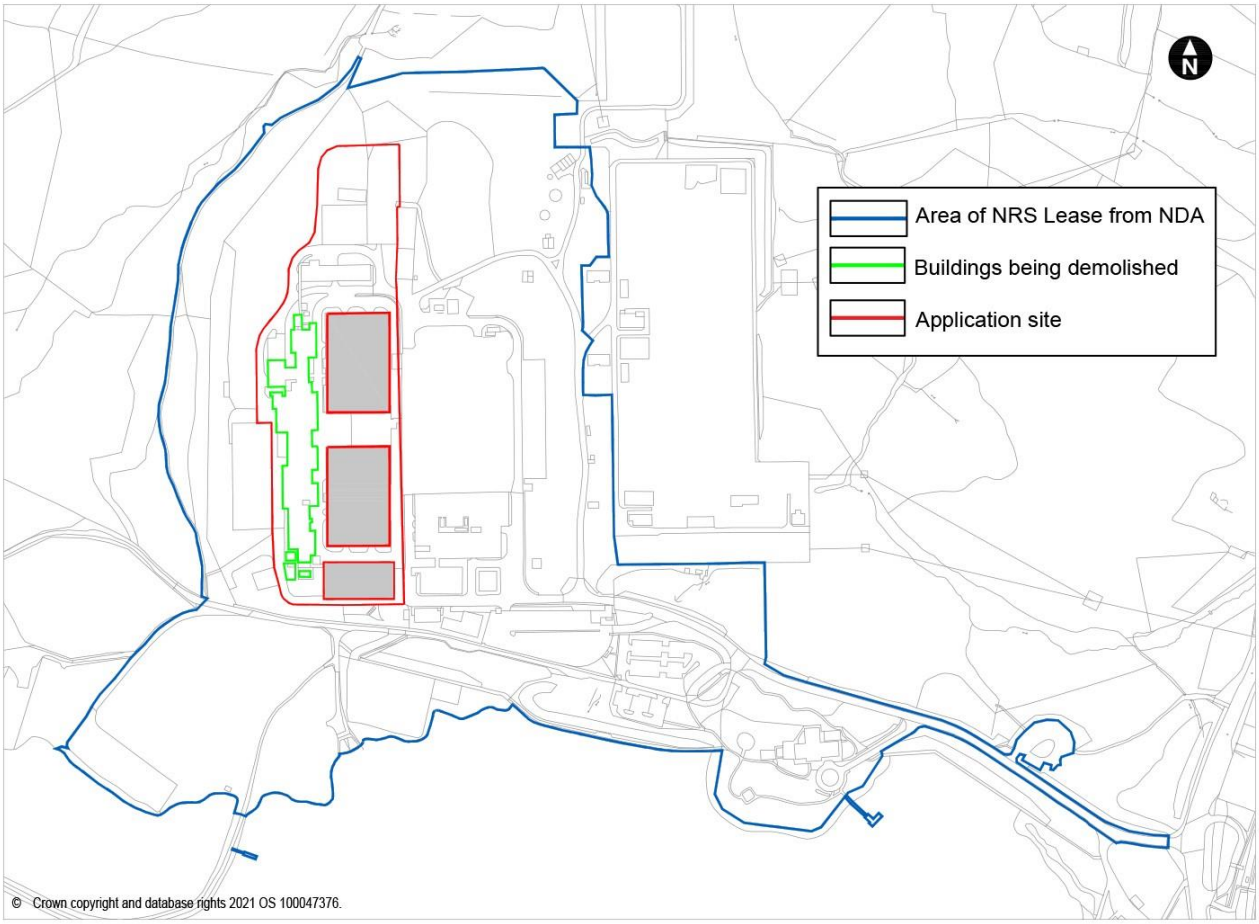


Graphic 1.1 Disposal Area - Indicated by brown line. Structures Highlighted in Yellow are those with Substantial Below-Ground Voids

1.2.4 The Disposal Area includes several redundant underground features which require no further physical works, but which are proposed to be permanently retained in place. This is the reason for inclusion of the inverted T-shape towards the centre of the graphic between the reactor buildings and the C-shape on the left of the graphic, south of reactor 1 (labelled as [R1] on **Graphic 1.1**).

1.2.5 The permanent retention aspects listed above include disposals of radioactive waste, at least as defined under environmental permitting regulations. The associated permit variation application required under Environmental Permitting (England and Wales) Regulations 2016 was submitted to Natural Resources Wales (NRW) in December 2023. Within this Environmental Statement, the term “Proposed Disposals” is used to reflect these aspects.

1.2.6 The extent and location of the site is shown on the site location plan below (**Graphic 1.2**), where the blue line shows the area under the applicant’s control, the redline shows the Application Site boundary (which excludes the two reactor buildings from the Application Site as well as the reactor area Access Control Block), the green line shows the ponds complex buildings to be demolished and the pink line shows the access route and work compound.



Graphic 1.2 Site Location Plan

1.3 Purpose of the Environmental Statement

1.3.1 Planning applications for certain types of development are, or may be, required to be accompanied by an "Environmental Statement". Such development is referred to in Town and Country Planning legislation as "EIA Development".

1.3.2 To determine whether a particular development is EIA Development, under the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (hereafter the "TCPA(EIA) (Wales) Regulations")[3] an "EIA screening opinion" may be obtained from the relevant local planning authority. To this end, the Applicant submitted a formal request for an EIA screening opinion to Eryri National Park Authority (ENPA) on 26th January 2022.

1.3.3 On 13th May 2022, ENPA issued a screening determination confirming the Proposed Development constitutes as EIA Development and an assessment of the likely effects of the Proposed Development should be undertaken and an Environmental Statement submitted with the planning application. A copy of the Local Planning Authority (LPA)'s screening opinion is enclosed at **Appendix 1A**.

1.3.4 By Regulation 17(3) of the TCPA(EIA) (Wales) Regulations[3], an Environmental Statement is a statement which should include a number of elements. These elements and where these are addressed in this Environmental Statement is set out in the table below:

Table 1.1 Elements to be included in an Environmental Statement listed in Regulation 17(3) of the EIA Regulations and where they are considered within this Environmental Statement

Elements to be included in an Environmental Statement	Where it is considered within this Environmental Statement
a) A description of the proposed development comprising information on the site, design, size and other relevant features of the development;	Chapter 3 – The Project and its alternatives
b) A description of the likely significant effects of the proposed development on the environment;	Chapters 5-9 on the Environmental aspects covered
c) A description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment	Chapters 5-9 on the Environmental aspects covered
d) A description of the reasonable alternatives studied by the applicant or appellant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen , taking into account the significant effects of the development on the environment;	Chapter 3 – The Project and its alternatives
e) A non-technical summary of the information referred to in sub-paragraphs (a) to (d); and	Separate Non-Technical Summary Document
f) Any additional information specified in Schedule 4 relevant to the specific characteristics of the development or type of development and to the environmental features likely to be significantly affected.	Chapters 5-9 on the Environmental aspects covered

1.4 Content of the Environmental Statement

1.4.1 Regulation 14(1) of the TCPA(EIA) (Wales) Regulations[3] states *"A person who is minded making an EIA application may ask the relevant planning authority to state their opinion as to the scope and level of detail of the information to be provided in the environmental statement (a "scoping opinion")"*.

1.4.2 Further to ENPA's EIA screening opinion (Ref: NP5/73/287J - dated 13 May 2022 – **Appendix 1A**), A formal request for a scoping opinion was submitted to ENPA on 15 September 2022. The Authority issued its scoping opinion (Ref: NP5/73/287M) on 30 November 2022 broadly agreeing that the scoping report (Ref: 807521-WOOD-XX-XX-RP-QA-000001), prepared by the then Wood Group UK Limited, addresses the main issues for consideration.

1.4.3 In light of Natural Resources Wales (NRW) consultation response to the request for a scoping opinion, the Applicant submitted further information to ENPA on 2nd

February 2023. This mainly related to the groundwater monitoring arrangements to support the proposed on-site disposals of the cooling ponds complex and near-by features. In response to this, ENPA issued a revised scoping opinion, dated 23rd March 2023, acknowledging the submission of further information regarding groundwater monitoring.

1.4.4 A copy of the LPA's revised scoping opinion is enclosed at **Appendix 1B** of this statement. The Applicant's response to the scoping opinion is included in **Appendix 1C**.

1.4.5 **Table 1.2** lists the environmental factors outlined in Schedule 4 (paragraph 4) of the TCPA(EIA) (Wales) Regulations[3] as requiring consideration and highlights where these have been considered or whether they are not relevant to the specific development proposed such that they have been 'scoped out'. The text following the table addresses the remaining topics.

Table 1.2 Environmental factors, as listed in Schedule 4 (paragraph 4) of the EIA Regulations, to be addressed and where they are considered within this Environmental Statement

Factor	Chapter scoped in or out of further assessment	Where it is considered within this Environmental Statement
Human Health	Scoped out and considered in a separate Health Impact Assessment document.	Whilst Human health as a separate EIA chapter is scoped out of the EIA, **Chapter 6: Noise and Vibration, Chapter 7: Geoenvironmental Impacts and Surface Water Quality** and **Chapter 9: Long-term Radiological and Non-radiological impacts** all consider impacts on people.
Biodiversity	Scoped in. Also considered in a shadow Habitats Regulations Assessment submitted with the application.	**Chapter 5: Biodiversity** **Chapter 9: Long-term Radiological and Non-radiological impacts** all consider impacts on non-human receptors.
Land / soil / water	Scoped in.	**Chapter 7: Geoenvironmental Impacts and Surface Water Quality** **Chapter 8: Flood Risk and Drainage** **Chapter 9: Long Term Radiological and Non-Radiological Impacts**.

Factor	Chapter scoped in or out of further assessment	Where it is considered within this Environmental Statement
Air	Air quality impacts are scoped out. Dust impacts on people are scoped out.	N/A (though see Planning Statement submitted with the application and Biodiversity chapter of this Environmental Statement).
Climate	Scoped out.	N/A
Material Assets	Scoped out.	N/A
Population	Socio-economic impacts are scoped out.	Whilst Human health as a separate EIA chapter is scoped out of the EIA, **Chapter 6: Noise and Vibration, Chapter 7: Geoenvironmental Impacts and Surface Water Quality** and **Chapter 9: Long-term Radiological and Non-radiological impacts** all consider impacts on people.
Cultural heritage	Scoped out.	N/A (though see **Planning Statement** submitted with the application).
Landscape	Scoped out.	N/A (though see **Planning Statement** submitted with the application).

Potential for major accidents and disasters

1.4.6 In accordance with paragraph 8 of Schedule 4 within the TCPA(EIA) (Wales) Regulations the ES should include "*A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned*."

1.4.7 The condition of the site at commencement of the development will be such that there are no high hazard radioactive or non-radioactive substances (other than some asbestos containing materials) remaining within the application site boundary.

1.4.8 The Radiation (Emergency Preparedness and Public Information) Regulations (REPPIR)[4] apply to the Trawsfynydd site. However, there is no longer a requirement for an off-site emergency plan to be maintained by the Local Authority because progress with decommissioning has eliminated the potential for an accident of sufficient severity to warrant having such a plan. The Proposed Development will not change this situation, during the works or afterwards.

1.4.9 Post-works, there will be no remaining significant hazards, whether related to radioactive or non-radioactive substances, within the Application Site boundary. The site of the Proposed Development will be capped with a concrete layer engineered to provide a safe working surface to allow decommissioning activities of the wider Trawsfynydd site to be conducted with an increased working area for doing so.

1.4.10 All below ground disposals will comply with Natural Resources Wales (NRW) requirements, including the protection of public health, natural resources, and the environment.

1.4.11 Where appropriate, the risks of disasters have been considered as part of the relevant chapters, specifically the risk of the failure of the dams on Llyn Trawsfynydd have been considered as part of **Chapter 8:Flood Risk and Drainage**.

Climate change

1.4.12 A greenhouse gas (GHG) assessment was scoped out of the air quality assessment as the demolition works will have negligible GHG emissions. Given the nature of the Proposed Development and limited requirement for material resources, it is expected any emissions arising from material use (e.g. concrete for capping) will be negligible. Furthermore, due to the short duration of the Proposed Development, there will be no requirement for significant power generation from diesel generators.

Cumulative Effects

1.4.13 In accordance with paragraph 5 of Schedule 4 within the TCPA(EIA) (Wales) Regulations the ES should include "*The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary,* ***cumulative****, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development."*

1.4.14 Cumulative effects of a development can occur as a result of the combined impacts of multiple developments on the same sensitive receptor, for example the noise impacts of two developments taking place in the same area on a nearby receptor that may, on their own not be significant, but when combined the effect could become significant. These are sometimes referred to as inter-project effects.

[4] UK Government (2019). *The Radiation (Emergency Preparedness and Public Information) Regulations 2019.* [Online] Available at: https://www.legislation.gov.uk/uksi/2019/703/contents [Accessed 02 April 2024].

1.4.15 Cumulative effects of a development can also occur as a result of the combined impacts of multiple in-scheme impacts on a sensitive receptor, for example the combined noise and dust impacts on an ecologically sensitive receptor. These are sometimes referred to as intra-project effects.

1.4.16 With respect to inter-project cumulative effects the anticipated schedule for the completion of the Proposed Development, as one part of the decommissioning of the Trawsfynydd site, is such that there is not expected to be any other major development activities taking place at the site over the same time period. Decommissioning activities at the site will be ongoing, but at a comparable intensity as exists at present. Therefore, this continuation of activities has been captured and accounted for when establishing the baseline for the impact assessments completed. **Chapter 3 The Project and Its Alternatives** describes the alternatives that have been considered across the Trawsfynydd Site in relation to the Proposed Development, and wider strategies. Whilst options are described, they are not part of any application at this time and therefore not considered in relation to inter-project cumulative effects. However, the cumulative effects of any such future developments will, at the time they are proposed, need to take into account other relevant developments.

1.4.17 There are also no consented, or proposed, developments, or allocations in the local development plan[5] the that the Applicant is aware of that are scheduled to take place in the locality (off-site) that are expected to be carried out during the relatively short operational period ("Works Phase") of the Proposed Development, that have the potential to result in cumulative impacts.

1.4.18 With respect to inter-project cumulative effects, where relevant, the combined effects of the Proposed Development on receptors are detailed within the relevant chapters of this Environmental Statement. For example, the combined effect of noise and light disturbance on ecological receptors is addressed in **Chapter 5: Biodiversity**.

Box 1.1 - Cumulative Impacts and Future Change

*Cumulative Impacts during the Works Phase (**Chapter 5, Chapter 6** and **Chapter 7**).*

There are no significant works planned to take place on the Trawsfynydd site during the Works Phase that need to be considered in a cumulative impacts assessment in respect of biodiversity (**Chapter 5**), noise & vibration (**Chapter 6**) or the geoenvironmental and surface waters (**Chapter 7**).

*Cumulative Impacts Post-Works (**Chapter 8**)*

Chapter 8 considers flood risk and drainage issues after completion of the works but prior to achievement of the site final end state.

The area of the former ponds complex will have a new concrete cap with associated new drainage for rainwater. The new drains, which are essentially the same as the drains that they will replace in terms of catchment area and

[5] Snowdonia National Park Authority, (2016). *Eryri Local Development Plan 2016 – 2031* [Online] Available at: https://planning.snowdonia.gov.wales/policy/local-development-plan/ [Accessed 02 April 2024].

drains routing, may be subject to gradual changes in demand over the decades due to climate change (drier summers, wetter winters, and an increase in storminess). However, the entire Trawsfynydd site drainage system will be maintained and its effectiveness subject to periodic review over the decades from around 2030 to the achievement of the final site end state.

*Cumulative Impacts on the Long-Term (**Chapter 9**)*

For the period in-between the end of the Works Phase and achievement of the site end state, the Trawsfynydd site will be an active decommissioning site, with many works going on, with maintenance of the proposed concrete cap over the former ponds complex, and maintenance of the site drainage systems. However, during this intervening period, the Proposed Development will not be having any significant adverse impacts. This is because no processes associated with the Proposed Development / Proposed Disposals that may lead to environmental changes are expected to occur to any significant degree during that period.

By the time the site is released from regulatory control, expected to be after around 2080, all physical works on the Trawsfynydd site will have ceased. For the long-term assessment, after the achievement of the site end state, all relevant likely or potential changes up to and after that time have been considered in the assessments, and the in-combination effects with radioactivity already in the environment due to past site operations and events have been considered.

The long-term assessments undertaken and reported in this Environmental Statement in **Chapter 9** have accounted for the expected site changes that will have been made by the time including the decommissioning of the site discharges system that currently pumps storm water run-off and captured groundwater from around the reactor buildings to Llyn Trawsfynydd. The potential effects of climate change on the long-term impacts after the site end state is achieved have been considered in the detailed assessments. The combined impacts of radioactivity migrating from the disposals, migrating from existing on-site radioactively contaminated land, and migrating from the lake, have been discussed in the Environmental Statement in the long-term impacts chapter (**Chapter 9**).

Whilst in the future on-site disposal of the reactor bio shields may be proposed, on the whole the assessments in the Environmental Statement have not included the in-combination effects of this. This is because it would be for that future development to account for past developments, and not for the current assessments to speculate about far future developments. This is standard EIA practice.

Transboundary Effects

1.4.19 In accordance with paragraph 5 of Schedule 4 within the TCPA(EIA) (Wales) Regulations the ES should include "*The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, **transboundary**, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.*"

1.4.20 The geographical extent of the likely potential impacts of the proposed development are discussed in each of the technical chapters (**Chapter 5, Chapter 6, Chapter 7, Chapter 8** and **Chapter 9).** The nature of the proposed development and its location are such that there is no potential for significant transboundary effects to occur.

1.5 Environmental Statement Structure

1.5.1 In accordance with Regulation 17 (4) of the TCPA(EIA) (Wales) Regulations an ES must:

"(a) be prepared by persons who in the opinion of the relevant planning authority or the Welsh Ministers, as appropriate, have sufficient expertise to ensure the completeness and quality of the statement;

(b) contain a statement by or on behalf of the applicant or appellant describing the expertise of the person who prepared the environmental statement…"

1.5.2 This ES has been prepared jointly by the Applicant and WSP. WSP is registered with the Institute of Environmental Management and Assessment (IEMA)'s EIA Quality Mark scheme. The scheme allows organisations that lead the co-ordination of EIAs in the UK to make a commitment to excellence in their EIA activities and have this commitment independently reviewed. **Appendix 1D** presents the Competent Experts and Competency Statement provided by the Applicant.

Table 1.3 Structure of this Environmental Statement

Chapter	Principal Authoring Organisation
PART 1 – Introduction to the Applicant, the Development, and the Site and Surroundings, Proposed Development and Regulatory Context	
Chapter 1: Introduction	Applicant
Chapter 2: Site and Surroundings	Applicant
Chapter 3: The Project and Its Alternatives	Applicant
Chapter 4: Regulatory	Applicant
PART 2 – Technical Chapters	
Chapter 5: Biodiversity (Works Phase Impacts)	WSP
Chapter 6: Noise and Vibration	WSP

Chapter	Principal Authoring Organisation
(Works Phase Impacts)	
Chapter 7: Geoenvironmental Impacts and Surface Water Quality (Works Phase Impacts)	WSP / Applicant
Chapter 8: Flood Risk and Drainage (Post-works, prior to final site end state being achieved)	WSP / Applicant
Chapter 9 Long-Term Radiological and Non-radiological Impacts (Impacts after achievement of final site end state)	Applicant, based on Galson Sciences and WSP (formerly Golder) assessments.
Chapter 10: Summary	WSP
Glossary of Terms	WSP / Applicant

1.6 Assessment of Effects and Determining Significance

1.6.1 Environmental Impact Assessment is a process for identifying the likely significant environmental effects (positive and negative) of a project, and subsequently providing a tool to inform decision-making with respect to the granting of consent by the relevant regulatory body. The EIA process should be systematic, analytical, impartial, consultative, and iterative allowing opportunities for environmental concerns to be addressed.

1.6.2 The EIA process culminates in the provision of an ES (this document) which presents the findings of the EIA and describes the likely significant effects, including cumulative effects, associated with the Proposed Development.

1.6.3 This section outlines the general approach followed in undertaking the environmental aspect assessments within the EIA. However, the assessments presented in this ES follow different methodologies specific to that aspect, which are based on recognised good practice and guidelines specific to each technical area.

1.6.4 The determination of the significance of the likely environmental effects arising from a development is a key stage in the EIA process. To assess the overall significance of an effect it is necessary to establish the magnitude of the effect occurring (i.e. the change to the environment as a result of the Proposed Development), the likelihood of the effect occurring, the duration and reversibility of the effect, and the sensitivity or importance of the receiving environment or receptor. Assessment of significance for environmental topics will include professional judgement with the consideration of a number of factors such as these.

1.6.5 The value of the receptors is assessed according to the relative importance of existing relevant environmental features, or by the sensitivity of receptors, i.e. whether they are likely to be robust enough to be unaffected by the Proposed Development, or alternatively are highly susceptible to the type of effects likely to occur. Criteria for the determination of sensitivity or value of receptors are established based on approved guidance, legislation, statutory designation, and/or professional judgement.

1.6.6 The sensitivity or value of a receptor is largely a product of the importance of an asset, as informed by legislation and policy, and as qualified by professional judgement. For example, receptors for landscape, biodiversity or the historic environment may be defined as being of international or national importance; lower value resources may be designated as being sensitive or important at a county or district level. The use of a receptor would also play a part in its classification. For example, a receptor used for recreational purposes may be valued more than a receptor used as a place of work.

1.6.7 The magnitude of change or impact affecting a receptor that would result from the Proposed Development would be identified on a scale from negligible up to major changes or the total or substantial loss of the receptor. For certain topics, the magnitude of change would be related to guidance on levels of acceptability (e.g. for air quality or noise), and be based on numerical parameters, whilst for others it will be a matter of professional judgement to determine the magnitude of change using more descriptive or qualitative terminology.

1.6.8 The assessments in this ES identify and propose mitigation measures that are required to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment. In addition, best practice mitigation measures are identified and proposed, whether needed in relation to significant adverse effects or not.

1.7 Consultation

1.7.1 Consultation with relevant bodies assists in ensuring that all potentially important environmental issues are identified, together with the likely significant environmental effects of the Proposed Development. This enables the EIA to operate as an iterative process, and in this way, the Proposed Development can be refined through the incorporation of mitigation measures to limit its adverse effects and enhance its beneficial effects where possible.

1.7.2 Various stakeholders have been consulted about the Proposed Development and the EIA process. This is described in the Statement of Community Involvement that accompanies the planning application, and in the Pre-Application Consultation (PAC) Report.

1.7.3 Consultation / engagement is also referred to within individual topic chapters where appropriate.

1.8 Other Required Consents

1.8.1 In addition to planning permission, other requirements for this Proposed Development include:

- A variation to the site's permit under Environmental Permitting Regulations (EPR)[6]. The application to Natural Resources Wales (NRW) for this permit variation was made in December 2023; and
- Adherence to an appropriate quality protocol for non-radioactive demolition arisings for use on site, or a Deposit for Recovery (DfR) permit from NRW under EPR[6], as required.

6 Natural Resources Wales, The Environmental Permitting (England & Wales) Regulations 2016, Permit EPR/GB3835DE for the management of radioactive wastes.

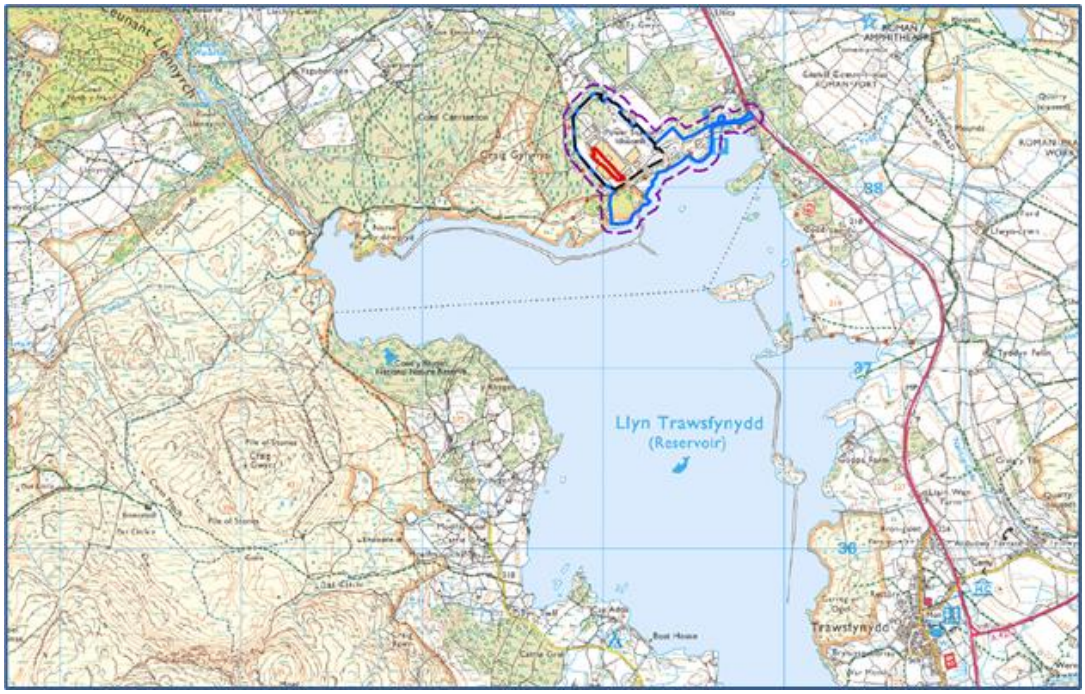
2. Site and Surroundings

2.1 Trawsfynydd Site

2.1.1 Trawsfynydd is a twin reactor decommissioning power station located within the Eryri National Park, within the Meirionnydd area of Gwynedd, North Wales. It lies close to the northern shore of Llyn Trawsfynydd, an artificial reservoir which occupies the valley to the west and north of the village of Trawsfynydd (approximately 3km away).

2.1.2 The plant, which became operational in 1965, was the only nuclear power station in the UK to be built inland and, when operational, cooling water was drawn from Llyn Trawsfynydd. Construction commenced in 1959, with both reactors operational by 1965. Generation ceased in 1991 and defueling was completed by 1997 with fuel elements removed from the site and transported to Sellafield for reprocessing.

2.1.3 The site lies west of the A470 trunk road which forms the main route between Dolgellau to the south and Ffestiniog to the North. A location plan of Trawsfynydd site, with the various land, lease and Permit boundaries is provided in **Graphic 2.1**, along with the application boundary of the Proposed Development.



Graphic 2.1Location of Trawsfynydd site

Note: The planning application boundary is shown in red, and the area of the NRS leased land from the NDA is shown in light blue. The purple dashed line is the NDA's ownership boundary, and the black dashed line is the EPR Permit site boundary.

2.2 Natural Environment

2.2.1 The Trawsfynydd site lies in a typically mountainous area of the Eryri National Park. North is the Vale of Ffestiniog which runs westward from Ffestiniog to the coast at Penrhyndeudraeth and the estuary of the Afon Dwyryd. This is a lowland valley with a fairly narrow alluvial plain contained within some steep, well wooded slopes. This contrasts with the area around the power station, which is perched at the northern end of a wide valley now largely filled by Llyn Trawsfynydd. This landscape is generally upland in character.

2.2.2 The land surrounding the site includes Llyn Trawsfynydd, as well as semi-natural woodlands, some of which are ancient woodland, broadleaved and coniferous plantation, watercourses, upland habitats, farmland/pasture, and scattered residential properties and farmhouses.

2.2.3 The surrounding landscape is mountainous, with the three highest surrounding peaks being Moelwyn Moer (770m) to the north, Craig Wen (556m) to the east and Moel Ysgyfarnogosd (623m) to the south-west. Closer to the Trawsfynydd site, the most prominent peak is Craig Gyfynys (275m). Many of these peaks and the areas around them are accessible to the public and provide vantage points from which the Trawsfynydd site can be seen.

2.2.4 The bedrock underlying the Trawsfynydd site and surrounding area is known as the Rhinog Formation which consists mainly of massively bedded siliceous, fine to coarse grained ‘greywacke’ (a type of silty sandstone) with occasional intercalations of mudstone and siltstone. Within the Trawsfynydd site, the ground has been levelled by a combination of blasting away the bedrock, excavation of drift materials and replacement with rock fill (combined blasted bedrock and drift materials).

2.3 Built Environment

2.3.1 There are few buildings within the immediate vicinity of the Trawsfynydd site. Those within the locality are associated with small farmsteads and comprise domestic scale cottages and small outbuildings. These are mostly constructed traditionally from stone and slate roofed, although some modern barns are constructed of corrugated steel or timber cladding.

2.3.2 Within the context of the surrounding small-scale buildings and settlements in the Eryri National Park, the Trawsfynydd site is a significant man-made structure in the landscape, but the scale of the setting helps to accommodate the development. The area has been greatly affected by other human activity, including prominent features such as the slate quarries at Blaenau Ffestiniog and the creation of Llyn Trawsfynydd.

2.3.3 The only vehicular access to the Trawsfynydd site is from the A470 trunk road. This road, which links Dolgellau (22km south) to Ffestiniog (10km north), runs immediately east of the Llyn Trawsfynydd.

2.3.4 Most settlements are located along the valley through which the A470 trunk road passes. There are many small settlements located near the Trawsfynydd site - north at Gellilydan and south at Trawsfynydd. These comprise a mix of traditional and modern buildings, generally of the local vernacular.

2.4 The National Park

2.4.1 Cynllun Eryri, The Snowdonia National Park Partnership Plan 2020[7] confirms various special qualities of the National Park. These are:

- *Diverse, high quality landscapes and seascapes within a small geographic area,ranging from coast to rolling uplands to rugged mountains for which Snowdonia is famed;*
- *A robust sense of community identity, cohesion, continuity and inclusivity combine to give a strong 'sense of place and belonging' within Snowdonia;*
- *The vibrancy of Welsh is most obvious in Eryri as it continues to be the choice of language in many social and professional environments. It is evident in local place names, the wildlife and history therein and is therefore intrinsic to the uniqueness of our cultural and natural heritage.;*
- *Snowdonia is a place which has inspired some of the nation's most notable culture, folklore, art, literature and music; an influence which continues across all creative pursuits to the present day;*
- *The opportunity for people to understand and enjoy Snowdonia National Park actively, whilst maintaining areas of silence, tranquillity and solitude, thus promoting vital aspects of health, wellbeing and personal reflection;*
- *Extensive opportunities for recreation, leisure and learning for people of all ages and abilities.;*
- *The changing relationship between people and nature over time has produced landscapes of great beauty and variety in Eryri; a national asset that is essential both to our identity and to our individual 'sense of place' and wellbeing.*
- *Complex varied and renowned geology, which has been vital in influencing the disciplines of geology and geography internationally;*

2.4.2 There are 17 National Nature Reserves in Snowdonia; more than in any other National Park in England and Wales; and 56 Sites of Special Scientific Interest. The tremendous biodiversity reflects the varied landscape, geology, climate and land management. The richness of plants and animals is fundamental to the history, culture, language, economy and ongoing well-being of all people who live in and visit the area.

2.5 Designated Sites

2.5.1 Within the Trawsfynydd site, there are two Grade II* registered historic park and garden elements, known as Dragon Garden and Dame Sylvia Crowe Garden. The Trawsfynydd site is also encompassed by the 'essential setting' for the Former Nuclear Power Station at Trawsfynydd and is located within a Registered Historic Landscape, the Trawsfynydd Basin and Cwm Prysor.

[7] Cynllun Eryri - Home [Accessed July 2024]

2.5.2 There are six statutory biodiversity sites of international importance (European Sites) within 10km of Trawsfynydd site, including five Special Areas of Conservation (SACs) and one Special Protection Area (SPA).

2.5.3 There are 15 statutory biodiversity sites of national or local importance within 5km, including 9 SSSIs and 6 National Nature Reserves (NNRs). The nearest designated site is a component of the Meirionnydd Oakwood's and Bat Sites SAC, located 0.93km south-west.

3. The Project and Its Alternatives

3.1 Project Description

3.1.1 This chapter describes the works associated with the Proposed Development, up to the point where the "**Disposal Area**", as shown in **Graphic 1.1**, is available for use by other decommissioning operations.

3.1.2 The project can be considered in three phases:

- Preparatory Phase (all internal works that do not require planning permission) - de-planting the buildings and structures, asbestos removal from within buildings that make up the ponds complex etc;
- Works Phase (expected duration about 24 months) – the main demolition activities, void infilling, construction of concrete cap and drainage installation; and
- Post Works Phase – environmental monitoring and various maintenance activities.

3.1.3 Whilst consent within this application is only being sought for the 'Works Phase', the Preparatory Phase and Post Works Phase has been referred to within the EIA to provide context to the works.

Terminology

3.1.4 In this Environmental Statement, "**in-scope**" means subject to regulation under radioactive substances legislation (EPR, Schedule 23[6]), and "out-of-scope" means not subject to regulation under radioactive substances legislation. In broad terms, in-scope may be thought of as legally radioactive, and out-of-scope as legally not radioactive.

3.1.5 As explained in the Planning Statement submitted with the planning application, whilst the radioactive materials being retained permanently, either in situ (i.e. left where they are) or being used as infill in voids, are, in environmental permitting terms, "waste", that is not necessarily the case within the Town and Country Planning3 regime for all the materials concerned. For comparison, non-radioactive redundant sub-surface structures left in the ground on former industrial sites are not usually regarded as "**waste**" in planning terms, even if contaminated by non-radioactive substances. Whilst the word "disposal" is used throughout this ES and in this chapter, this is often only because that is how the permanent retention of the redundant radioactive structures and void infill is considered within the environmental permitting regime[6]. Use of the word "**disposal**" is also a convenient shorthand means of describing the aspects of the Proposed Development most relevant to this chapter. The use of the word "disposal" should not be taken to have specific meaning in Town and Country Planning.

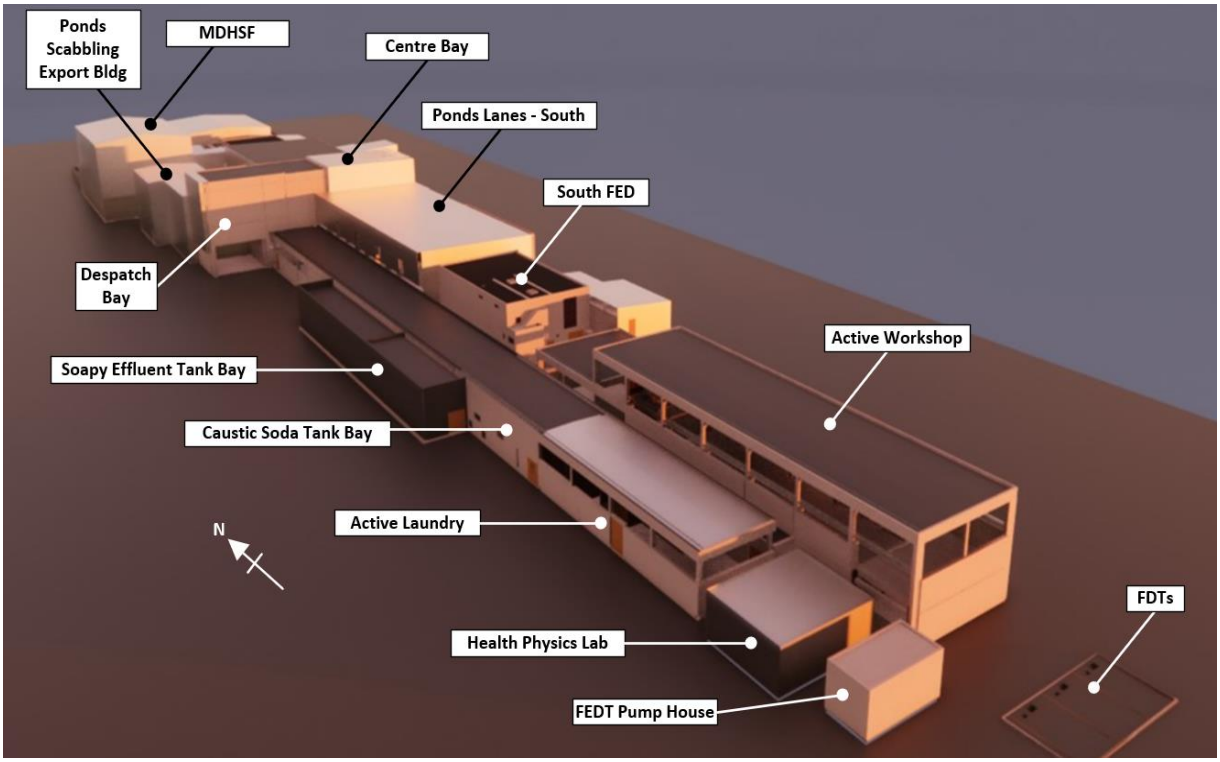
3.1.6 Sometimes within this Environmental Statement, rather than using the term "Proposed Development", the term "**Proposed Disposals**" is used, particularly **Chapter 9**. This is because a significant part of the Proposed Development, namely the demolition works, is not always relevant to the matters being discussed.

3.1.7 **“Radionuclides”** are unstable forms of chemical elements that release radiation as they break down. In some contexts, radionuclides are referred to by the UK’s environment agencies as “hazardous substances” because of their radioactivity. In this Environmental Statement, when radioactivity is the primary property of interest, then in general the term “hazardous substance” is not used, but rather other terms such as “radionuclide” or “radioactive contamination” are used. In land use planning there is a regime related to gaining consent for the storage and use of defined hazardous substances from the planning authority. In Wales this is legislated via the Planning (Hazardous Substances) (Wales) Regulations 2015[8], however as the Trawsfynydd site is subject to a nuclear site license it is exempt from this regime. Again, the use of “radionuclide” or “radioactive contamination” is used to avoid any confusion in this regard.

Development Scope

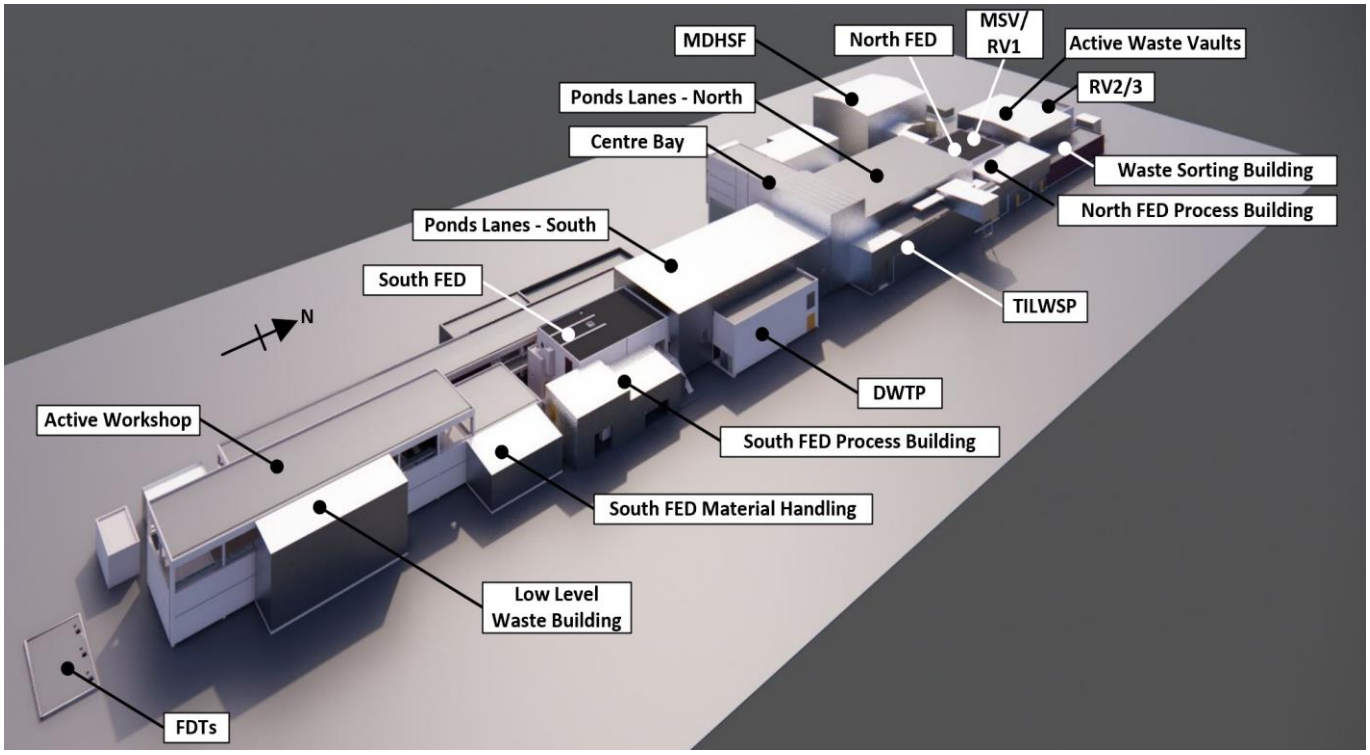
3.1.8 The Trawsfynydd ponds complex is a collection of 36 buildings, some including below ground voids, initially built over a half a century ago to process and dispatch spent fuel from the reactors and undertake waste storage and processing operations. The buildings within the “Disposal Area” to be demolished (to around ground level) are shown **Graphic 3.1** and **Graphic 3.2**. Suitable demolition arisings will be emplaced within below ground voids (where this is radioactive it is referred to in environmental permitting documentation as disposal-for-a-purpose). A concrete cap will be constructed over much of the ponds complex footprint, with associated drainage.

[8] The Planning (Hazardous Substances) (Wales) Regulations 2015, Regulation 4 (Schedule 2, Para 8)



Graphic 3.1 Existing ponds complex, viewed from south-west[9]

[9] MDHSF – Magnox Debris Handling and Storage Facility. FED – Fuel Element Debris. FDT – Final Delay Tank. FEDT – Final Effluent Delay Tank.



Graphic 3.2 Existing ponds complex - viewed from south-east[10]

[10] RV - Resin Vault. MDHSF – Magnox Debris Handling and Storage Facility. FED – Fuel Element Debris. FDT – Final Delay Tank. MSV – Main Sludge Vault. TILWSP – Transportable Intermediate Level Waste solidification plant. DWTP – Decant Water Treatment Plant.

3.1.9 Some redundant radioactively contaminated infrastructure is proposed for permanent retention in situ (referred to in environmental permitting documentation as in situ disposal). This includes:

- radioactively contaminated below ground structures of the ponds complex;
- below-ground redundant former active drains structures;
- a redundant concrete below-ground trench within the ponds complex;
- localised radioactively contaminated parts of the western crane track foundation wall; and
- the former gaseous effluent filter vaults.

3.1.10 No radioactive waste will be brought to site for disposal.

3.1.11 Prior to the works for which planning permission is sought, there will be de-planting and “soft strip” of the internal spaces[11]. In addition, structural assessment of the existing voids has identified that strengthening work is required to the floors of some of the voids to maintain their long-term integrity[12]. These are also internal enabling works not requiring planning permission. There will also be some internal works undertaken on under-ponds sampling drains; these works would be prior to the Proposed Development commencing and do not require planning permission.

3.1.12 The Disposal Area includes several redundant underground features which require no further physical works but which are proposed to be permanently retained in place. It is the Applicant’s view that the retention of these features does not constitute development and therefore planning permission for these elements is not required. However, as these elements are detailed in the permit application that has been made, they are referenced for completeness and to ensure any in combination effects are considered.

3.1.13 Other similar developments will likely be proposed in the future for other areas of site as decommissioning progresses, notably for the reactor bio shields. These are not part of the present application.

[11] When the development commences all areas will have been de-planted to remove installed plant and equipment (tanks, pipework, valves, electrical equipment, and the like) to ensure a demolition ready state. All accessible bulk asbestos will be removed prior to demolition and all remaining asbestos bound within the fabric of the building structure will be managed during the demolition phase in accordance with the Control of Asbestos Regulations (CAR) 2012.

[12] The Active Effluent Treatment Plant basement void is to be strengthened including construction of a new structural floor slab capable of supporting the load from the disposal infill materials and stabilisation of the side walls when the roof slab is removed. The concrete cover layer to the top reinforcement in the pond’s lanes south and other features as necessary will be reinstated where the concrete surface has previously been scabbled off.

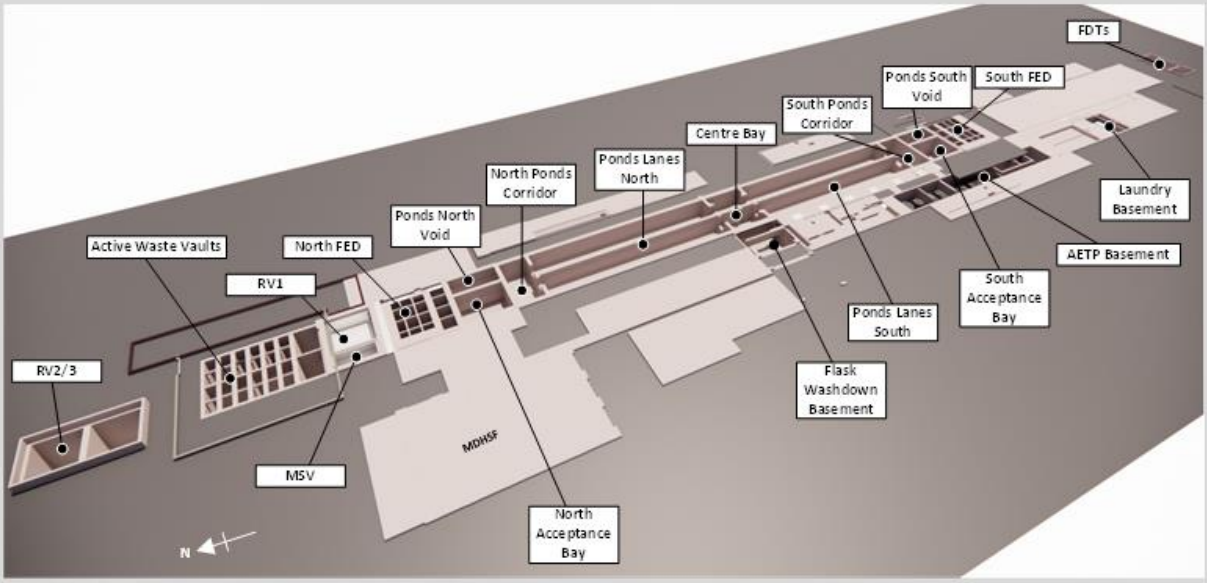
3.1.14 The Trawsfynydd site final end-state will be reached towards the end of this century. Exact details can only be determined once all other site decommissioning has been completed and will depend on next site use. Achieving the final end-state is likely to be subject to further planning and permitting applications nearer the time; this is not part of the present application.

Works Phase

3.1.15 An overview of the works phase is provided in Box 3.1 below.

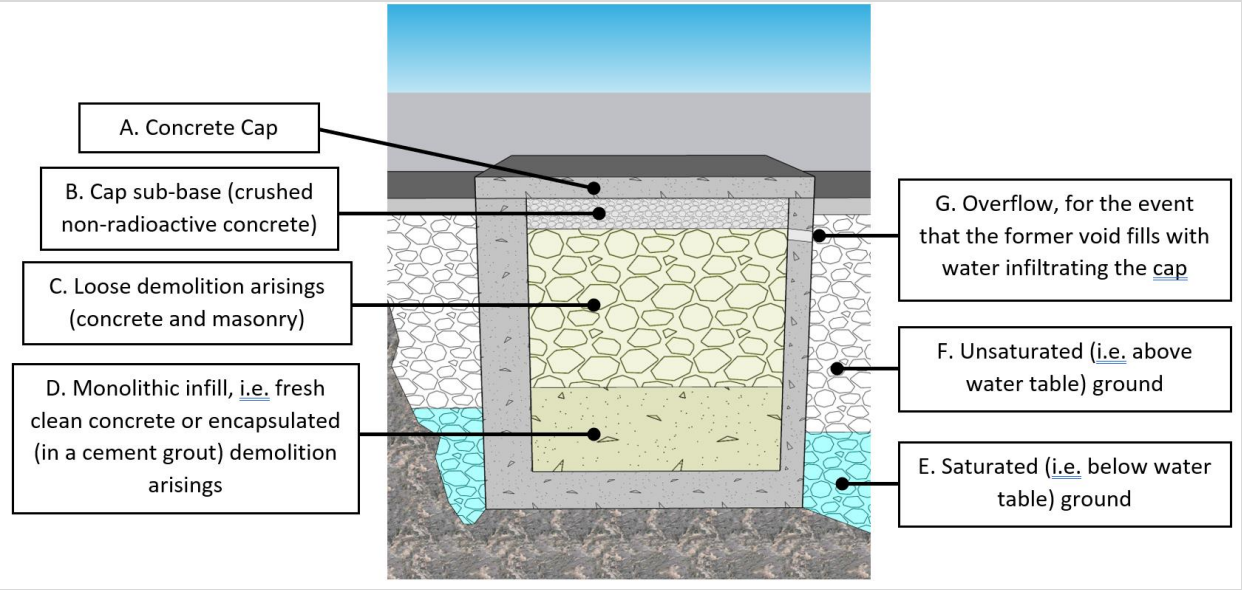
Box 3.1 - Works Phase Overview

The void infill aspect involves demolition of above ground structures and the emplacement of radioactively and potentially some non-radioactively contaminated demolition arisings (concrete and masonry) to backfill the below ground ponds complex voids.



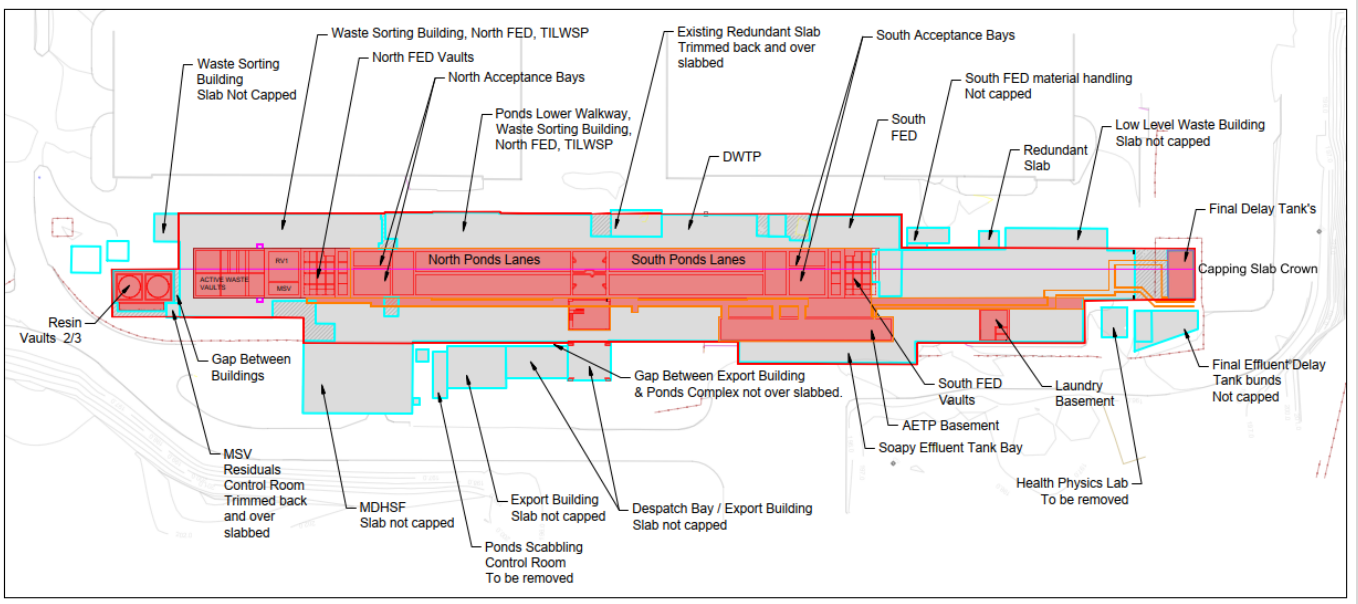
Acceptance criteria, including for emplacement of demolition arisings, will be produced for approval by NRW as part of the environmental permit variation. This means that only suitable wastes and materials will be retained in situ or used for void infill as agreed with NRW. This is important as a mitigation against unsuitable materials being placed (or retained) in below-ground voids. The acceptance criteria will have associated internal management arrangements and compliance checks.

Several voids are proposed to include monolithic infill to above the highest expected groundwater level; this may be achieved using clean concrete before emplacement of demolition arisings, and/or with permeation grouting of pre-emplaced demolition arisings.



Concrete Cap

A concrete cap is required to be sufficiently load-bearing for normal heavy vehicular traffic and to provide an operational area to support ongoing site decommissioning. Being necessarily made of concrete, it will be resistant to infiltration of surface water (and water bars will be used between construction joints) and will direct run-off to newly constructed drains. The extent of the proposed concrete cap is shown below.



Drainage

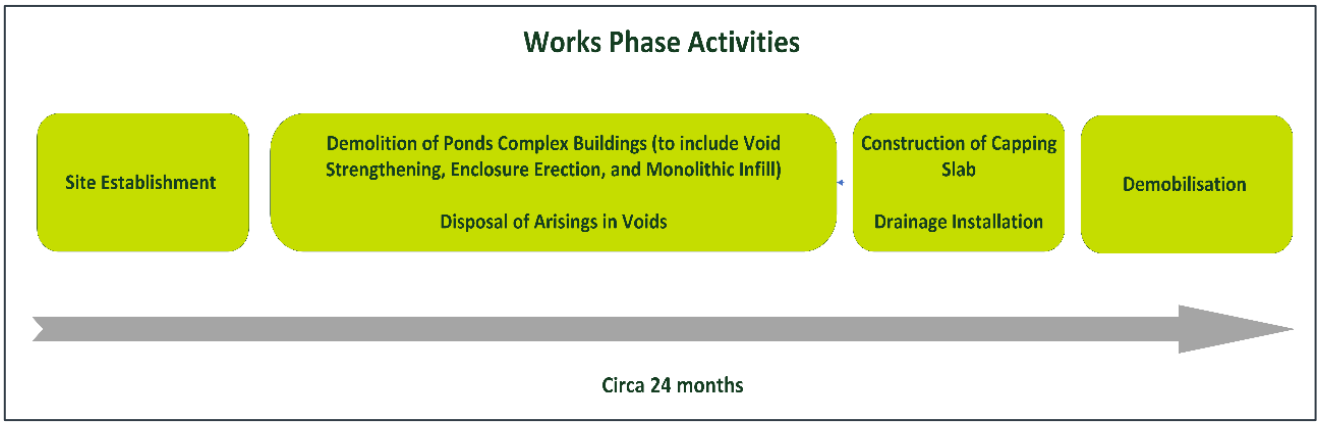
The current ponds complex surface water drainage system collects water from the roofs and adjacent hardstanding areas via a number of gullies and downpipes, some routing via drains beneath the existing building footprint. The collected water then flows via an oil interceptor towards an existing surface water pumping station known as the “diversion culvert”. Water arriving at the pumping station sump is then pumped to Llyn Trawsfynydd. A new drainage system will be installed local to the ponds complex to align with the east and west sides of the concrete cap. The drainage system will connect to the existing Trawsfynydd site surface drainage system as described above.

Plant and Equipment

An estimate of the types of plant and equipment required for the execution of the works is included in **Appendix 3A**. In general, any of this equipment could be used separately or simultaneously during working hours. The smaller plant and equipment items may be used either internal or external to the buildings.

Stages

3.1.16 The stages of the Works Phase are illustrated in the **Graphic 3.3** below.



Graphic 3.3 Schematic of Works Phase stages

3.1.17 As explained above in there are no other major concurrent developments (construction or demolition works) on the Trawsfynydd site are currently planned when the demolition aspects of the Proposed Development are being carried out. The following developments will have been completed prior to commencement:

- Reactor height reduction (carried out under the 2003 planning permission, APP/H9504/X/02/514892);
- Further development of the laydown area using reactor height reduction materials (to be carried out under a planning permission expected in 2024); and
- Replacement of Roadway 5 oil interception drain.

Working Hours

3.1.18 Working hours will be between 08:00-18:00 Monday to Friday during the Works Phase, and there may be some work undertaken on Saturdays 08.00 – 13.00. Physical external works outside of these hours is not anticipated except for time critical activities, for example manual surface finishing following the concrete pours for the cap. It is likely that such out-of-hours working will be subject to Section 61 consent under the Control of Pollution Act 1974[13].

[13] Control of Pollution Act 1974. [Online] Available at: https://www.legislation.gov.uk/ukpga/1974/40/contents [Accessed 02 April 2024].

Traffic

3.1.19 The required numbers of HGVs and total vehicle numbers have been estimated for the duration of the Proposed Development – see **Appendix 3B**. The busiest period for HGV deliveries will be during the construction of the concrete cap. These estimates are for the Proposed Development only. No other major development activities associated with decommissioning are currently scheduled to occur simultaneously with the Proposed Development, but ongoing asset management will continue as normal.

Site Management

3.1.20 Temporary offices and welfare facilities will be provided within a site compound to be located in the area of the site to the north of the reactor buildings.

3.1.21 There are expected to be up to ten porta-cabins for offices and welfare facilities. Several ISO containers will be placed within the site compound to be used for storage. Materials and plant will be stored within the site compound. The site compound may also be used for the temporary storage of demolition arisings awaiting either clearance and disposal off-site or emplacement within the ponds complex below ground voids. Demolition arisings may also be crushed within the compound prior to being used in the development.

3.1.22 The Application Site is entirely within the secure nuclear licensed site. All contractors will be required to complete security vetting, and a host brief which informs the contractor of the site security, safety, and environmental arrangements.

3.1.23 There will be no requirement to change existing site access roads. The access to site is via a dedicated access road that meets the A470 at a standard priority junction with a right turn lane.

Waste Management

3.1.24 Waste which is not suitable for backfilling voids, such as wood, metal, cladding, roofing materials, Waste Electrical and Electronic Equipment (WEEE) and discrete asbestos-containing wastes, will be segregated and consigned to appropriate lockable waste skips, if necessary, in preparation for being sent off site for recycling, treatment or disposal as appropriate. These will be managed in accordance with normal site procedures.

3.1.25 In terms of volumes, it is estimated that around 70 tonnes of roofing material, 50 tonnes of metal, 28 tonnes of glass, 5 tonnes of plastic and negligible volumes of wood and other wastes will be created as part of the demolition operations.

Demolition Methods

3.1.26 Within the ponds complex building are 10 gantry cranes (individually up to 40 tonnes). These will be removed in a controlled manner using conventional demolition techniques.

3.1.27 It is expected that standard demolition machinery will be used to dismantle precast concrete elements and break up the cast in-situ concrete and masonry progressively. Other techniques may include cutting the structures into blocks using wire saws, circular saws etc. or splitting sections of the structures to be removed by drilling a series of holes then applying a hydraulic pressure or introducing a swelling mortar agent to induce cracks.

3.1.28 The exact method of building demolition will be governed, however, by hazards associated with the structures being demolished. Clean and lightly contaminated structures that will not generate “in-scope” radioactive dust could be demolished using conventional “open-air” methods, after decontamination or treatment of internal surfaces as necessary (see **Graphic 3.4** below).

3.1.29 For more contaminated structures, where radioactive dust could be generated, demolition will either involve techniques and controls to prevent generating dispersible radioactive dust, e.g. targeted sawing around areas of contamination, or the demolition work will be performed within an enclosure that will capture and contain the radioactive dust (**Graphic 3.5**).

3.1.30 For conventional “open air” demolition, a water mist would be used to limit the spread of dust. It is not expected that the mists would be adding enough water to result in flowing or standing water, but any surface run-off water will be monitored and, where necessary, treated to reduce suspended solids and neutralise pH prior to discharging via the site drainage system.

3.1.31 Water may also be used for capturing dust when demolishing structures that will create “in-scope” radioactive dust, however, this water would be managed as radioactive effluent and will be processed and discharged via the site’s existing Active Effluent Treatment Plant.

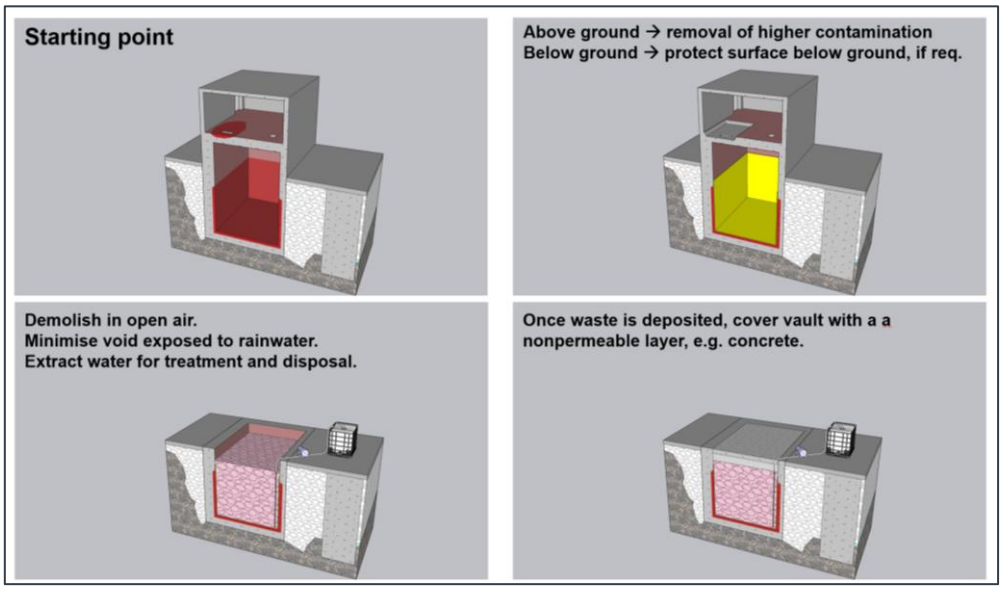
3.1.32 All radioactive discharges to air and water will be done in accordance with an existing permit issued by NRW. The permit places conditions for minimising the amount of activity discharged, the impacts from those discharges, and limits the amount of activity that can be discharged.

Backfilling of Below-Ground Voids

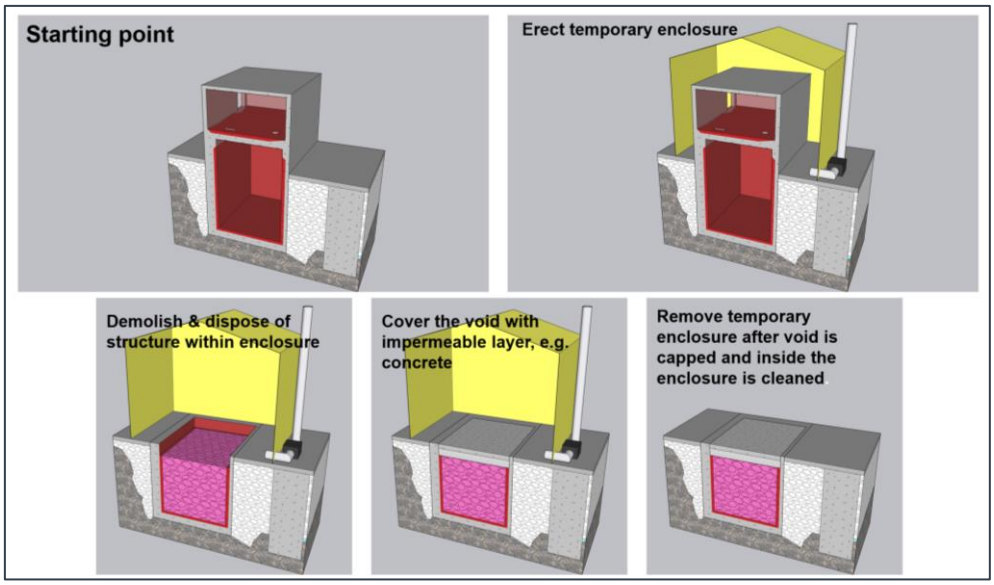
3.1.33 If required, mobile crushing unit(s) and conveyor system(s) with in-built dust suppression technology will be used to size reduce the concrete and masonry material for infill operations. This plant may be deployed either adjacent to the demolition location and associated void or within the site compound. For non-radioactive material the waste may be processed into a suitable material for use as a concrete cap sub-base on top of the backfill material. Potential surplus of demolition material will be identified, cleared as non-radioactive, and kept separate to the other waste. It is expected that around 1,000 m3 to 1,500 m3 of such material will be disposed of from site.

3.1.34 Infill material may be placed by tipping from a dump truck or lowered into deeper voids using the bucket of an excavator. It may also be that some larger blocks are lifted into place within the voids, these could have been precast components or blocks cut out at the demolition face and transferred directly to a void. Infill material may be compacted after emplacement.

3.1.35 Open voids will be covered as much as reasonably practicable to minimise the potential for rainwater ingress (this may be by means of tenting and/or using removable covers). This is to ensure that the rate at which potentially radioactively contaminated, high pH and high suspended solids water is accumulated does not exceed the throughput of the site's Active Effluent Treatment Plant. Water entering voids will be pumped (from submersible pumps emplaced at appropriate locations throughout the complex, likely into sumps to which water would drain) into temporary storage containers to enable the water to be sampled and analysed to determine any treatment requirements prior to disposal and to determine the most appropriate disposal route.



Graphic 3.4 Likely Approach for Demolishing Structures with Low Levels of Contamination (no potential for radioactive dust when demolishing above ground structure). Water extraction also shown



Graphic 3.5 Likely Approach for Demolishing Structures with Higher Levels of Contamination (potential for radioactive dust). Ventilation controls also shown. Red denotes radioactive contamination

Graphic 3.4 and **Graphic 3.5** Key:

- Deep shade of red – radioalogical contaminated parts of the strucutre that could generate radioactive dust during demolition.
- Light shade of red – lightly contaminated structures that will not generate radioactive dust when demolished.
- Yellow – protective measure introduced for demolition to contain radioactive contamination (sealant or over-structure).

Installation of Concrete Cap

3.1.36 The concrete cap will be reinforced and constructed with either imported ready mixed concrete or, if a suitable local batching site cannot be used, then concrete may be batched on site. For site batched concrete, aggregate will most likely be imported because it is anticipated that there will be insufficient volumes of site-derived material, and this may also be unsuitable to provide the structural integrity required for the design. Material quantities are estimated to be in the region of 2,000 m3 of concrete and around 300 tonnes of reinforcement based upon a typical steel volume proportion being 1.5% of the concrete volume for this type of structure.

Installation of New Drainage Arrangements (for the Concrete Cap)

3.1.37 The concrete cap will be laid to falls and edge drainage will be incorporated to collect surface water runoff coming from the cap. The edge drainage will likely be in the form of linear channel drains installed using conventional shallow drainage construction techniques. The concrete cap will be cast up to these. Buried drainage pipes will also be installed to outfall from the channel drains and connect into the existing site surface drainage network to ensure there are no discharges

to ground. Construction is likely to include the use of standard drainage materials. Only shallow excavations will be required for the installation of drainage.

Post Works Phase

3.1.38 Maintenance plans will be developed for:

- The drainage system around the cap and leading towards the point at which the new drainage system joins with the existing drainage system. This will include periodic inspections and removal of blockages.
- The concrete cap. This will include periodic inspections and the repair of significant cracks or fractures. The concrete cap will also be restored to its initial condition as far as practicable prior to release of the site from regulatory control (see below); and
- Borehole installations to be used for long-term monitoring. Any replacement or additional boreholes required in the future will be subject to further planning requirements at the time.

3.1.39 The Post Works Phase monitoring is summarised in WSP 2023, Application Stage Post-Implementation Water Environment Monitoring Plan that forms part of the current permit application that the Applicant has made to the Environmental Regulator to vary the permit for the Trawsfynydd Site. This adaptable plan includes monitoring of numerous boreholes across the Trawsfynydd site as well as of site discharge points. No monitoring of the interior of the in-filled voids is proposed. The Post Works monitoring plan will be subject to controls via the site's environmental permit, and therefore does not require control through planning permission conditions. A summary of the preliminary Post Works Phase monitoring plan is given in **Appendix 3C**.

3.2 Decommissioning works to be undertaken on the Trawsfynydd site in advance of Proposed Development

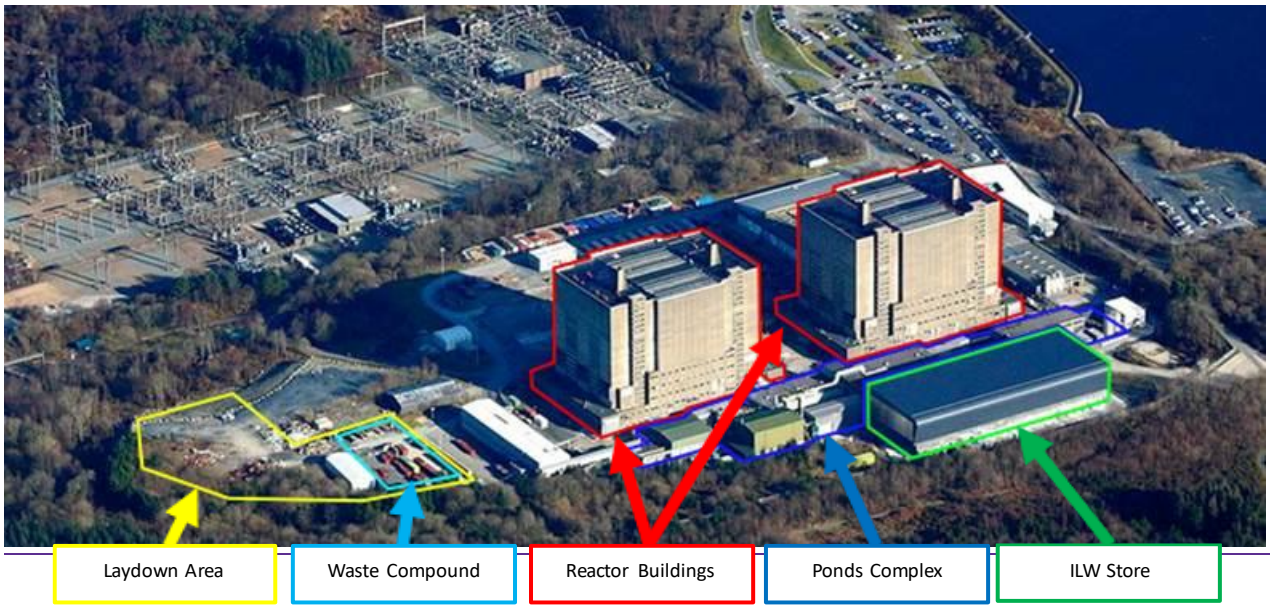
3.2.1 The Proposed Development is currently expected to start towards the end of the 2020s. As part of the ongoing decommissioning works, the following works will be completed in advance of the Proposed Development commencing::

- The two reactor buildings will have been significantly reduced in height;
- Crushed concrete from the reactor building height reduction works will have been used to extend the general laydown area, largely outside the Application Site, at the northern end of the Trawsfynydd licensed site. This laydown extension will require the removal of some current vegetation on the site;
- The ISO containers in the waste compound, just north of the Resin Solidification Plant, within the Application Site and part of the proposed works compound for the present application, will have been relocated (if not removed from the Trawsfynydd site altogether); and
- A groundwater interception drains at the lower end of the site, that intercepts oil contaminated groundwater, will have been upgraded.

3.2.2 By the time that the main issues discussed in the long-term impacts radiological and non-radiological assessment (**Chapter 9**) become relevant (after about 2080), the following changes are assumed to have occurred:

- The site end-state will have been reached, meaning that the reactor buildings will have been removed, the Intermediate Level Waste stores will have been removed, the current storm water and ground drainage systems will have been disabled (or at least no longer maintained) and potentially replaced with passive systems, and the currently operating groundwater extraction system by the reactor 1 building will have ceased operation; and
- The site will no longer have a nuclear site licence or an environmental permit, and uncontrolled access to the site is assumed to be possible.

3.2.3 The lower parts of the reactor bio shield (the concrete shielding around the reactor cores, and the concrete base on which the reactor cores are positioned) may also have been proposed and permitted as on-site disposals of “radioactive waste”, as is proposed now for the ponds complex area (the “Disposal Area”). However, as bio shields disposal would require its own planning permission and environmental permit variation. In accordance with normal EIA practice, the cumulative impacts of the ponds complex disposals with possible future development such as the bio shield disposals have not been included in any detail in the Environmental Statement. It would be for the assessments of bio shield disposal to take account of the present Proposed Development, as and when bio shield disposal is proposed.



Graphic 3.6 Aerial Image of the Application Site

3.3 Environmental Management (Works Phase)

3.3.1 As part of the planning application a **Construction and Demolition Environmental Management Plan** has been prepared that details the mitigation measures that will be employed during the works phase of the development.

Dust and Mud

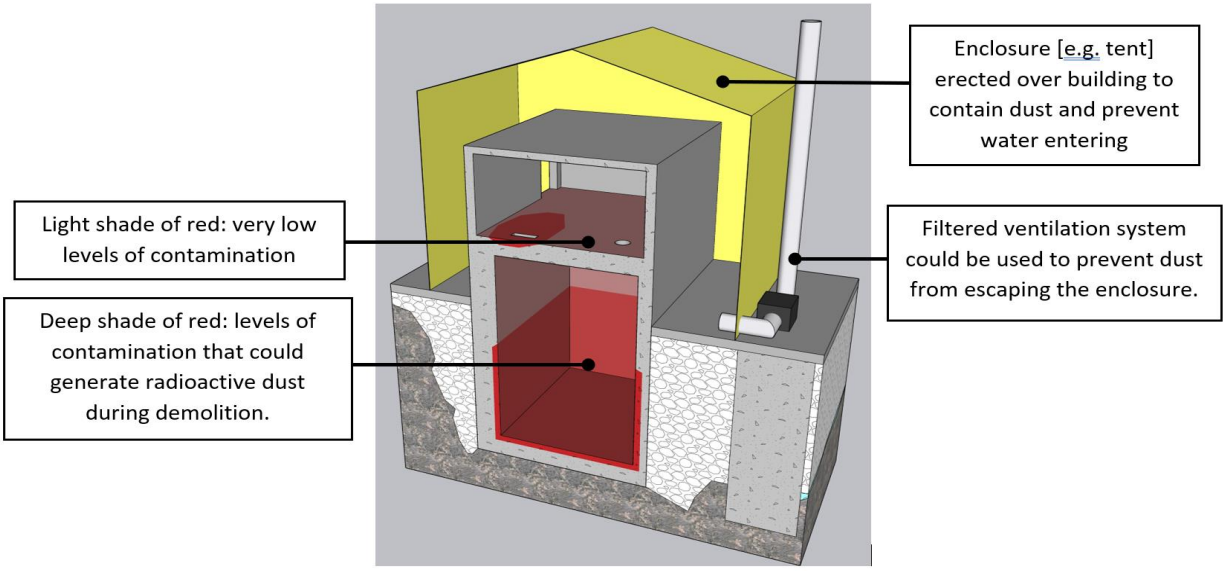
3.3.2 Temporary, secured sheeting of stockpiled material will be adopted to minimise windblown dust and rainwater run-off. Water mists (see **Graphic 3.7**) will be used in dry conditions during material handling (loading / unloading) to suppress airborne dust levels. On-site roads will be regularly cleaned of mud/dust deposits, including the use of re-circulating water wheel washers and road cleaners (**Graphic 3.8**) as appropriate.

Graphic 3.7 Use of Water Sprays to Reduce Airborne Dust (stock image)

Graphic 3.8 Use of Road Cleaner (stock image)

Control of Radioactive Discharges of Particulates to Air

3.3.3 For waste that has the potential to create dispersible “in-scope” radioactive dust, the waste will either be handled in a manner that prevents creation of dispersible radioactive dust or the work will be undertaken within an enclosure to contain the radioactive dust (**Graphic 3.9**). Where necessary, ventilation systems will be used to enhance the containment performance of enclosures. Where ventilation systems are used the exhausted air will be filtered using high performance particulate filters as the means to minimise radioactive discharges. Enclosures will remain until the contained radioactive dust has been removed or immobilised.



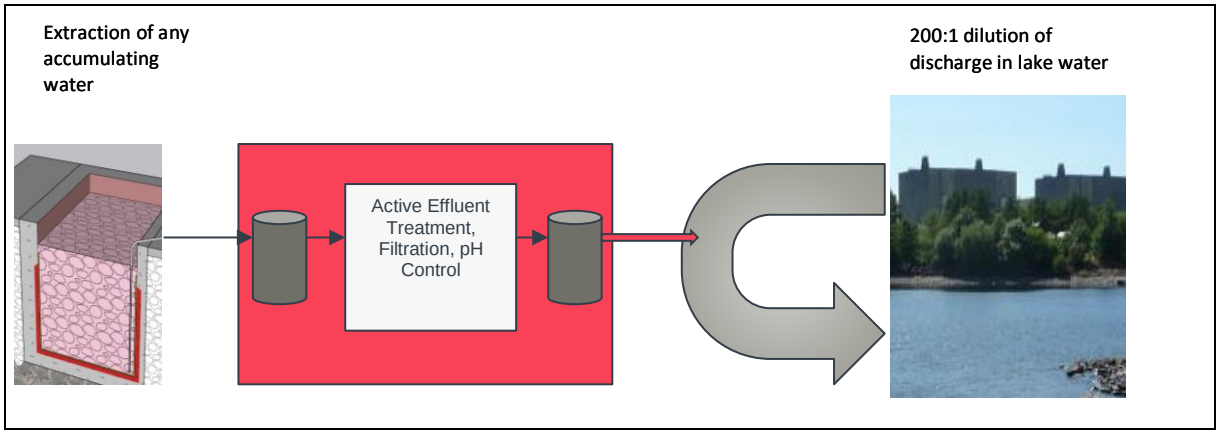
Graphic 3.9 Controlled, Filtered and Monitored Ventilation (demolition of structures that may generate radioactive dust)

Water Accumulating Within Voids Being Infilled

3.3.4 For any water interacting with radioactively contaminated concrete and masonry within the voids being filled, the management of wastewater must comply with the existing discharge permit, permit no. EPR/GB3835DE, issued by NRW. The permit requires the operator to minimise the amount of radioactivity being discharged from the permitted site. Minimisation is primarily achieved by limiting water from encountering radioactive contamination in the first place[14]. Where it is not feasible to prevent water encountering radioactive contamination the resulting water will be extracted and sampled before the appropriate management route is determined. Effluent will be discharged to Llyn Trawsfynydd, where appropriate via the site’s existing Active Effluent Treatment Plant[15] (**Graphic 3.10**).

[14] The capacity of the treatment plant is limited and therefore any exposed voids must be managed to ensure that the rate of accumulation of contaminated water does not exceed the capacity of the Active Effluent Treatment Plant.

[15] The active effluent treatment plant contains a hydro-cyclone and fine mesh filters to remove particulates prior to discharging treated water.



Graphic 3.10 Treatment and Discharge of Radioactive Effluent Via the Active Effluent Treatment Plant

Rainwater Run-Off

3.3.5 Non-radioactive contaminants discharged via the site drainage system must comply with an existing discharge permit that limits the amount of pollutant concentration discharged to Llyn Trawsfynydd (Permit No. CG0087701). This permit sets a discharge limit of 50mg/ltr for suspended solids and an acceptable range of between 6 and 9 for pH. Additionally, the permit requires that the works shall be operated as far as reasonably practicable to prevent the discharge from containing any significant trace of visible oil or grease (there is an oil separator as part of the system prior to the discharge point).

3.3.6 The quality of the site drainage water will be frequently checked with mitigating actions such as removing the source term for the contaminants, e.g. cleaning the demolition area, or treatment of the demolition run-off water. For the demolition area, where a high level of suspended solids is possible, the water will be intercepted, e.g. by bunding demolition area drains and pumping captured effluent into a water treatment plant that will consist of a sustainable means to remove suspended solids, and an automatic CO_2 dosing system, to correct the Ph (**Graphic 3.11**). Treated water will then be discharged via the existing and permitted site drainage system.

3.3.7 Where necessary, storm/road drains within the wider works area [beyond the immediate demolition area] will be fitted with protective mats to prevent any dust or sediment in wider areas from being directly washed into them during the works[16].

[16] Prior to any works commencing, a review of the site surface water drainage system will be carried out to determine appropriate drain protection for sediment and define which drains need to be temporarily blocked and suitable reroutes established.

Graphic 3.11 Example of a Mobile Non-Active Waste-Water Treatment Plant

Lighting

3.3.8 Within and adjacent to the ponds complex area there is existing night-time illumination for buildings, as well as low level 'street' lights for the roads and pathways. However, suitable additional external task lighting may be required for at least the lay-down areas in the site compound to complete any early morning and end-of day activities. Task lighting will be provided using temporary low level directional mobile units. There will not normally be any night-time illumination of the Application Site outside of normal working hours, other than that from existing site security lighting.

3.3.9 Lighting will only be used during the project working hours, when necessary, and will be designed in such a way that light is directed towards the area where it is needed at an appropriate brightness.

3.3.10 The following mitigation and best practice will be implemented:

- Unless health and safety requirements dictate otherwise, no lighting shall face directly outwards from the Application Site;
- No lights will be positioned such that light would be directed to the woodland to the west of the Application Site;
- Lights will be switched off when they are not needed; this will include periods outside of normal site working hours; and
- Checks will be made each evening to ensure no lights are left on in error; and
- Where suitable, temporary lighting with light sensing and timer controls will be used.

Prevention of Spills and Leaks

3.3.11 Temporary fuel storage tanks or tankers will be required to refuel demolition machinery, these shall be located, managed and operated in accordance with best practice. Details of pollution control measures are provided in the **Construction and Demolition Environmental Management Plan** submitted with the planning application.

Environmental Monitoring

3.3.12 The groundwater, dust and noise monitoring is described in the **Construction and Demolition Environmental Management Plan** submitted with the planning application. All permitted gaseous and aqueous outlets from the site are also monitored in accordance with the site's environmental permit requirements.

3.4 Alternatives

3.4.1 Schedule 4 of the TCPA (EIA) (Wales) Regulations[3] (Information for Inclusion in Environmental Statements) requires: *"A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the applicant or appellant, which are relevant to the proposed development and its specific characteristics and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects"*.

3.4.2 In this chapter, the main alternatives to and for the Proposed Development are discussed in relation to the following topics:

- The timing of demolition of the ponds complex;
- On-site versus off-site disposal of radioactively contaminated concrete and masonry;
- Demolition methods, processing and segregation;
- Radioactive inventory management; and
- The detailed design of the proposals.

3.4.3 As a reminder, "in-scope" means subject to regulation under radioactive substances legislation and "out-of-scope" means not subject to regulation under radioactive substances legislation (Environmental Permitting Regulations[6], Schedule 23). As such, the term "in-scope" may be thought of as "radioactive", and "out-of-scope" may be thought of as "not radioactive".

3.4.4 Note that in this chapter all directions are given with respect to "site north". Site north aligns with the two reactor buildings and is slightly off set from true north. The use of this site orientation system makes describing the location of on-site features easier.

Timing of demolition of the ponds complex

3.4.5 Trawsfynydd power station ceased generating electricity in 1991. The Trawsfynydd site is now being decommissioned, with all structures eventually being removed to around ground level. If demolition of the ponds complex were to be further deferred for any significant period, there would be two main disadvantages:

- A new weatherproof overbuilding would have to be constructed over most of the ponds complex, resulting in avoidable construction works, avoidable materials use and additional costs, with long-term maintenance being required; and
- There would continue to be little space immediately to the west of the reactor buildings, limited to being only that space between the reactor buildings and the ponds complex.

3.4.6 In addition, there would be limited benefit from radioactive decay by deferring the demolition works. For these reasons, early demolition of the ponds complex ahead of reactor dismantling works is proposed. As much of the above and below-ground parts of the ponds complex and other nearby structures are radioactive waste[17], the options of on-site and off-site disposal of that waste need to be considered.

On-site versus off-site disposal of radioactively contaminated concrete and masonry

3.4.7 It is the Applicant's view that there would be no significant adverse environmental consequences of the proposed on-site disposals, not least because most of the environmental impacts (such as on groundwater) will be limited by regulation and permitting regimes. Further details are provided in **Appendix 3D**.

3.4.8 The Applicant considers the proposals to be an improvement in environmental terms upon the original strategy of removing all radioactivity (to reach out-of-scope levels) from this part of the site, as discussed at the end of this chapter.

Background

3.4.9 The Trawsfynydd decommissioning strategy was reviewed in 2019 (see **Appendix 3D**), prompted to a large extent by changes to regulatory requirements. One change, following the issue of the Environment Agencies' guidance *"Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation Version 1.0: July 18"* (commonly known as the GRR), was a new condition introduced by Natural Resource Wales (NRW) in Trawsfynydd site's environmental permit.

3.4.10 The new permit condition requires the Applicant to develop an optimised waste management plan for the remaining lifetime of the site to enable the eventual release of the site from control under the Environmental Permitting Regulations. There has always been a requirement for optimised radioactive waste management plans, but in practice the new condition draws attention to radioactive structures (including sub-surface ones) and is not limited to other forms

[17] Apart from some peripheral and outer uncontaminated structures.

of radioactive waste requiring management that have tended to be the focus previously[18]. The new permit condition is in addition to existing permit conditions requiring that radioactive wastes are disposed of at times, in a form, and in a manner to minimise radiological effects on the environment and the public, taking into account all relevant factors including social and economic factors.

3.4.11 The environmental permit conditions apply to all the radioactive wastes at the site that require management, including radioactive concrete and masonry. Such concrete and masonry wastes are different to most other radioactive wastes on nuclear sites as they are credible options to be permanently left on the site as on-site disposals. The permit change described above, and the associated regulatory guidance, means that there is now a requirement for every nuclear site undergoing decommissioning to assess whether such on-site disposal options are preferred over removal for disposal in suitable facilities elsewhere.

3.4.12 Draft UK Government policy "Managing Radioactive Substances and Nuclear Decommissioning 2023" also presents on-site disposals of such radioactive wastes as a credible and potentially preferable option for nuclear sites undergoing decommissioning. This is discussed further in the Planning Statement accompanying this application. This is proposed by the UK Government in recognition that the costs and detriments of total clean-up that would be incurred across many nuclear sites in the UK would be very significant.

Options: Ponds Complex

3.4.13 The strategy for the Trawsfynydd site involves two types of on-site disposal (in environmental permitting terms) in relation to the ponds complex and associated redundant sub surface infrastructure:

- 'In situ disposal' – Disposal of radioactively contaminated sub-surface structures, mainly concrete, (permanently leaving them where they are); and
- 'Disposal for a purpose' – Disposal of radioactively contaminated concrete and masonry demolition arisings for the purpose of infilling unwanted sub-surface voids within the ponds complex.

3.4.14 There are three basic alternatives to this strategy of on-site disposal for the radioactively contaminated ponds complex concrete and masonry structures as described above:

- The pre-2019 strategy could have been pursued further towards the goal of decontaminating all the ponds complex structures to the extent that the sub-surface structures would no longer be "radioactive", and the demolition arisings to be used for infill would also not be radioactive. This would include decontamination by means such as further scabbling and/or shaving of concrete surfaces and breaking out more deeply penetrating contamination would generate relatively small volumes of further radioactive waste requiring off-site disposal using existing routes. However, experience of the practical

[18] For example, operational Low-Level Waste and Intermediate Level Waste. These types of waste, of course, will remain important considerations for the operator and regulators for decades to come.

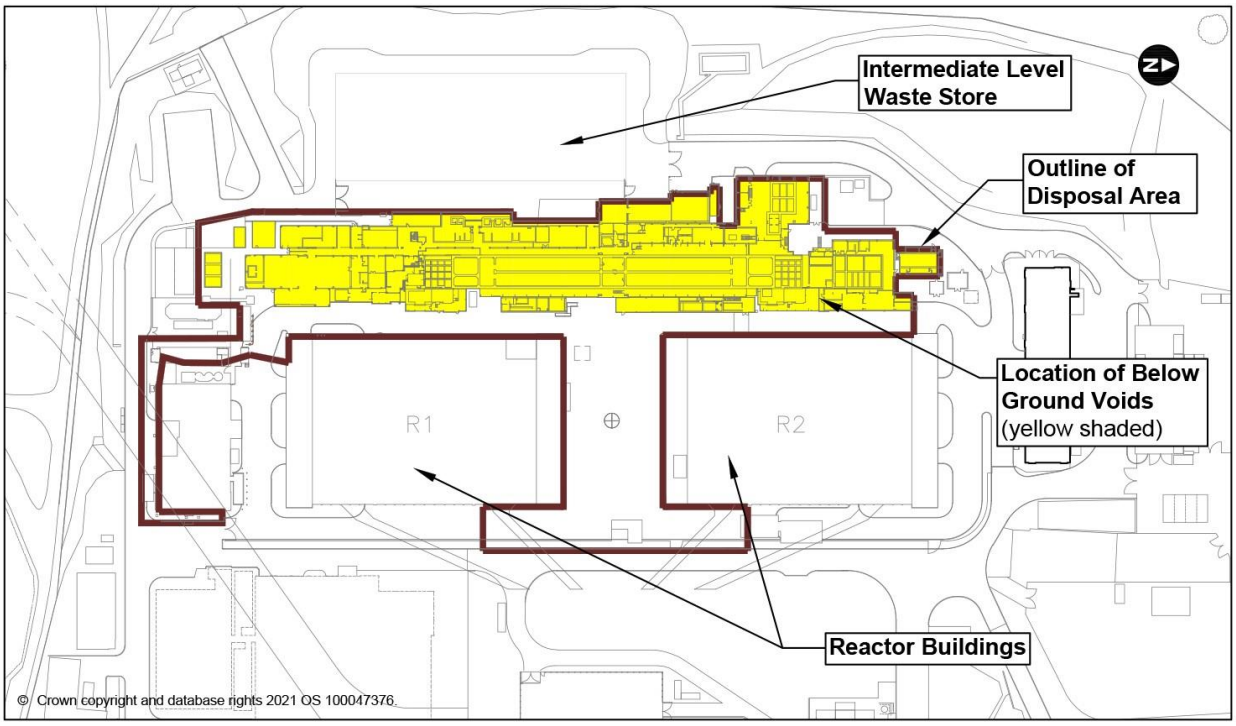
difficulty of achieving such levels of decontamination of the structures has shown that continuing with this strategy would have minimal chance of success unless rigorously pursued for many years. This would incur grossly disproportionate costs and subject the workforce to avoidable radiological and non-radiological risks.

- Bulk removal would be an alternative means of removing the radioactive contamination of the ponds complex structures. This alternative could only practically be undertaken after, or towards the end of, reactor dismantling, meaning that the ponds structures would need to be maintained for some decades, potentially with a new overbuilding[19]. This option would generate very large volumes, indicatively around 12,000 m^3, of low activity radioactive waste for off-site disposal in a landfill. This figure includes excavated soils, because this alternative for dealing with the ponds complex structures would inherently involve deep excavations and off-site disposal of at least some of the associated radioactively contaminated ground. The disposal of all this waste would be at a distance from Trawsfynydd, increasing the environmental impacts from transport and reducing remaining capacity in the receiving landfill. There may also be a need to import additional material (circa 10,000 m^3) to infill the large excavations, unless there was sufficient out-of-scope material created on site through other decommissioning activities that could be used, or significant site re-landscaping.
- A hybrid alternative would be to include only in situ disposal of radioactive waste and not disposal of radioactive demolition arisings for the purpose of infilling unwanted voids. In comparison with the second alternative above, this would result in roughly halving the volume of concrete and masonry radioactive waste for off-site disposal. The Applicant considers this a sub-optimal strategy due to the environmental impacts associated with transferring radioactive waste for off-site disposal at a landfill facility. The demolition material proposed to be used for infill will contain a relatively small proportion of the total radioactive inventory in the ponds complex (most of the inventory is in the below-ground structures proposed for disposal in situ). There would also be a need to source around 5,000 m^3 of alternative material for void infill purposes, potentially from off site.

Options: Redundant Sub-Surface Radioactively Contaminated Infrastructure (part of the present application)

3.4.15 There are several radioactive, sub-surface redundant features that are within the “Disposal Area” and also proposed for on-site (in situ) disposal, accounting for the shape of the Disposal Area in the graphic below (**Graphic 3.12**).

[19] There are variations of this deferred excavation option, such as retaining all of the ponds complex, or demolishing to ground level and retaining the below-ground structures only.



Graphic 3.12 Disposal Area - Indicated by brown line. Structures Highlighted in Yellow are those with Substantial Below-Ground Voids

3.4.16 The only alternative to the on-site (in situ) disposal of redundant sub-surface radioactively contaminated infrastructure (such as drains) would be to excavate the structures. This would add to the volume of radioactive waste for disposal off-site (it would be unlikely to be used for infilling ponds complex voids) and disrupt the important reinforced concrete roadway between the ponds complex and reactor buildings. If the strategy for the ponds complex includes in situ disposal of radioactively contaminated structures, then by extension the same strategy makes sense for the relatively minor features outside of the ponds complex.

Options: Contaminated Ground (not part of the present application)

3.4.17 None of the above options for dealing with the ponds complex and associated sub-surface contaminated infrastructure would result in a completely non-radioactive footprint within the Disposal Area, unless further very large excavations were undertaken. This is because none of these options for the structures would involve removing all the radioactively contaminated ground that is present. Radioactively contaminated ground is not waste and therefore does not need a permit under Environmental Permitting Regulations[6] or need planning permission to be left permanently in situ[20]. There being no significant safety implications of permanently

[20] However, leaving such contamination *in situ* would eventually require the approval of NRW (subject to a satisfactory site-wide environmental safety case) prior to eventual release of the site from control under Environmental Permitting Regulations.

leaving the radioactively contaminated ground in place, this is the Applicant's current plan.

Options: Bio shields (not part of the present application)

3.4.18 A case has also been made for on-site disposal of most if not all the radioactive concrete of the biological shields (bio shields) of the two reactors. The bio shields have around 20,000 m^3 of radioactive concrete in them, of which substantial portions are below-ground. This is greater than the ponds complex. The Applicant believes on-site disposal is also the optimum solution for the bio shields, as well as for the ponds complex, for reasons relating to cost, worker dose, vehicle movements, and avoiding the use of the limited disposal capacity at off-site disposal facilities such as the Low-Level Waste Repository in Cumbria. There are also below-ground voids within the reactor buildings that could physically accommodate all the above-ground bio shield concrete if used as infill, like the proposals for the ponds complex.

Options: Closed asbestos disposal area (not part of the present application)

3.4.19 To the north of the ponds complex there is an asbestos disposal area previously licensed to receive the site's non-radioactive asbestos wastes for burial in pits. This is now closed, the licence having been surrendered in 1993. If all the radioactive structures and radioactively contaminated land were to be removed from the site, the site would not be free of all hazards unless this asbestos was also removed. Excavation of the buried asbestos wastes would be a highly hazardous operation, generating wastes for disposal elsewhere for no benefit (unless as part of a future development proposal requiring such excavations).

Summary

3.4.20 The Applicant's Site-Wide Environmental Safety Case in support of the environmental permit variation application for the Proposed Development includes consideration of potential radiological and non-radiological impacts of on-site disposal of the bio shield concrete and of leaving the remaining radioactive contaminated ground permanently in situ. NRW will not grant a variation to the environmental permit unless it is satisfied that the ponds complex disposals are consistent with an optimised Waste Management Plan for the whole site. The Applicant is not currently applying for planning permission or variation to the environmental permit to include on-site disposal of the bio shield concrete, though it is the Applicant's intention to ultimately do so. This would require the submission of further applications in due course.

3.4.21 In summary, the complete clean-up of the Trawsfynydd site including the ponds complex structures, radioactively contaminated land, the bio shields, and potentially the asbestos disposals, would be extremely challenging and would require significant expenditure and time with large excavations and avoidable off-site lorry movements. The Proposed Development only concerns the ponds complex and some associated near-by relatively minor radioactive features, but it is important to consider the justification for this development in the context of the wider site (e.g. the presence of asbestos disposals) and future on-site disposal plans (for the reactor bio shields).

Demolition methods, processing, and segregation

3.4.22 The details of demolition methods will be agreed between the Applicant and the appointed demolition contractor, after contract award. However, demolition arisings for void infilling are expected to be mainly a combination of broken concrete and masonry, cut concrete blocks and intact precast concrete elements. Crushing of radioactive demolition arisings would introduce more project complexity and a greater need for radiological and contamination controls.

3.4.23 Segregation of out-of-scope concrete and masonry demolition arisings from radioactive demolition arisings will be required to form an out-of-scope sub-base layer beneath the new concrete cap but will also be undertaken with a view to minimising the volume of radioactive arisings requiring off-site disposal.

Radioactive inventory management

3.4.24 The buildings that make up the ponds complex are undergoing clean out activities where internal items are removed, leaving rooms completely or largely empty (some pipework may remain). This will be part of the preparatory phase and complete prior to demolition and will remove substantial amounts of radioactivity. The Applicant is, though, considering whether any further parts of the current radioactive inventory should be removed prior to demolition, and the associated waste then disposed of off-site or re-emplaced at a lower level in the voids. The reason for this would be mainly to achieve a reduction in the hypothetical doses to people who may occupy the site in the future, or who may inadvertently intrude into these parts of the disposals once the site has been released from regulation, or who may use land elsewhere where excavated material from these parts of the ponds complex has been deposited. The issue of such targeted radioactive inventory removal or reduction will be kept under constant review as new or additional information becomes available over the coming years. This is so that no site occupancy scenarios or intrusion events would result in doses or dose rates to members of the public in the future that are not consistent with or substantially lower than the regulatory guidance levels for such events.

Form of demolition arisings

3.4.25 As noted above, demolition arisings for void infill are expected mainly to be a combination of broken concrete and masonry, cut concrete blocks and intact precast concrete elements. There is expected to be some crushing of non-radioactive demolition arisings but only where there is an engineering need for a non-waste product, for example to form the sub-base for the reinforced concrete cap. Steel rebar within demolition arisings will be removed as far practicable from concrete demolition arisings (by machines such as munchers), applying the waste hierarchy in relation to metals recycling.

3.4.26 Freshly exposed concrete surfaces can interact with water creating leachate alkalinity. The option to emplace some or all the concrete demolition arisings as cut blocks or intact precast elements would greatly reduce the surface area of freshly exposed concrete. This option would likely require a much more “hands-on” work approach than conventional demolition and would be much more time consuming and costly. However, the possibility that some structures may be more safely or efficiently demolished by lifting out (in the case of precast components) and/or by cutting into blocks is not ruled out. In addition, such an approach could

be adopted, at least in part, for radiological protection of workers during the implementation works.

Form of infill to sub-surface voids

3.4.27 In the future, water will start to enter the below-ground voids either from above (through the concrete cap) or from the sides. This will react with the demolition arisings leading to the creation of alkaline leachate. One option to mitigate this would be to fully solidify all the emplaced demolition arisings with a cement-based grout, and / or to fill voids with clean concrete rather than the demolition arisings. This is judged to be disproportionate due to the excessive use of cement needed and given that groundwater levels external to the structures are generally below the internal void floor levels.

3.4.28 The Applicant instead proposes to bind some of the demolition arisings in cement or use clean concrete, termed “monolithic infill”, at least for specific locations within the sub-surface voids. This approach will not reduce leachate contamination levels (radioactivity and/or alkalinity) where the water comes from the infiltration of rainwater from above, but it will mitigate the potential for polluting alkaline and/or radioactive leachate from flowing from the voids directly into surrounding groundwater[21].

3.4.29 The Applicant proposes that monolithic infill would be used where the typical groundwater level is above the internal void floor level[22], totalling less than 10 percent of the overall void volume. The use of targeted monolithic infill in this way will mean that unconditioned demolition arisings will be above the typical upper level of the water table. If fresh concrete (option 3 below) were to be used rather than permeation grouting (option 1 below) then all demolition arisings would be positioned in the voids above the typical upper level of the water table. The total volume of grout or concrete required is not high and would not significantly increase vehicle movements bringing the required materials to site.

3.4.30 As alluded to above, monolithic infill could be created by various methods[23]:

1. Demolition arisings could be emplaced in the bottom of a void, to a level just above that required, then free-flowing grout used to permeate the spaces within the demolition arisings up to the required level. Once the grout has cured, the remainder of the void would be infilled with other suitable demolition arisings without the use of grout;
2. Demolition arisings from the ponds complex could be crushed to form aggregate for on-site manufacture of fresh concrete that would be poured into the void, up to the required level for monolithic infill. Once the concrete has cured, further infill would then be added, as for (1) above; and

[21] In the Water Environment (England and Wales) Regulations, there is a prohibition of direct discharges of pollutants to groundwater.

[22] Climate change is not expected to significantly affect the typical upper level of the water table in these voids.

[23] Decisions on which of the options should be used in specific locations have not yet been made.

3. The required monolithic infill could be created using fresh concrete made with a source of aggregate other than ponds complex demolition arisings (most likely sourced off-site).

3.4.31 There are two small sets of voids where the water table is well above the internal floor levels and close to the ground surface. These are Resin Vaults 2 and 3 at the northern extremity of the ponds complex and the Final Delay Tanks at the southern extremity. For these voids, the creation of monolithic infill up to approximately ground level is proposed to minimise the risk of leachate being created that could discharge directly into the surrounding groundwater.

3.4.32 Another alternative to minimise the risk of direct discharges of pollutants to groundwater would be to either rely on the sub-surface structures as they are without monolithic infill or to attempt to seal joints and cracks in the structures before infilling. Any sealing of joints and cracks would be likely to fail relatively rapidly and may just displace the points of water ingress / egress. The voids could be fully lined (tanked), but any such liner would have to be very robust (e.g. made from metal) so as not to be damaged during infill, and any liner should not be prone to corrosion (so might have to be made from stainless steel). Enhancing hydraulic integrity from the outside of the structures, through the use of cut-off walls, is not practicable in this case.

Leachate pathway management

3.4.33 The concrete cap over the infilled voids (discussed below) will largely prevent the infiltration of surface water into the infill beneath. In the very long term (after eventual release of the site from regulation), the cap may be expected to degrade, allowing increased infiltration of surface water. If the floor and walls of a void were still watertight, this could result in leachate building up within the infilled void until it reaches the underside of the cap. This undesirable scenario is often compared to a bathtub filling up until it overflows.

3.4.34 To counter this, the Applicant proposes to create deliberately engineered penetrations, i.e. gaps in the concrete walls, near the tops of the outer walls enclosing the infilled voids, well above the water table. These penetrations will ensure that, if the bath-tub effect happens, leachate would not emerge at or near the ground surface but would infiltrate downwards into the unsaturated ground surrounding the structures until it reaches the water table. The Applicant considers this preferable to the use of lower-level penetrations that would avert the bath-tub effect but allow leachate forming in the lower parts of the voids to enter groundwater more quickly.

3.4.35 While the site remains permitted it is expected that there will be a cap maintenance regime in place. When surrendering the permit in the future after full site decommissioning is complete, it is also possible that the Applicant will, either voluntarily or as a condition, make certain improvements to the cap prior to permit surrender. These could include the use of an impermeable membrane or clay, covered by suitable soils.

Sampling drains

3.4.36 The ponds complex contains many different spaces and voids. The largest of these are the “ponds lanes” and connecting “bays” where spent fuel was

temporarily stored underwater prior to transport to Sellafield for reprocessing. The walls and floors of these structures incorporate sixteen transverse (side-ways) construction and expansion joints and a single longitudinal (length-ways) construction joint. Because the ponds lanes contained water (5.5m deep), the construction and expansion joints included water bars to limit leakage, and "sampling drains" on their external faces (including underneath) to capture any water that did escape. Physical sampling and measurements using instrumentation inserted into the drains from outside have shown that all these sampling drains are radioactively contaminated, as they were all impacted by ponds water leakage to some extent.

3.4.37 The pipe and surrounding gravel in the most radioactive drain was removed and the remaining concrete trough filled with concrete in 2016. Four more drains will be dealt with in the same way prior to commencement of this development, as these are in direct contact with groundwater[24]. Also prior to this development, six more sampling drains may be injected with grout with the aim of fixing the contamination and/or excluding groundwater. This is currently preferred over removal because removal would involve larger radiation doses to the workers and incur greater costs.

3.4.38 Currently no decision has been made about how to manage the single sampling drain underneath the Final Delay Tanks. This is because it is not yet known if it is radioactively contaminated or in contact with groundwater.

Capping design

Cap Design

3.4.39 Once the ponds complex area has been demolished and capped, it will be used as part of the work area for future site decommissioning. The available space for large scale works on the site is limited and this area is needed to safely complete the work. Because of this the capping over the ponds complex structures must provide a sufficiently robust surface, capable of sustaining the load from heavy vehicles. The cap needs to span across the voids, with no direct reliance on support from the infill. These design requirements eliminate the use of soft capping techniques that are typically used for landfill sites. Instead, the cap needs to be constructed of reinforced concrete.

3.4.40 The horizontal dimensions of the cap are such that construction joints will certainly be needed, and possibly one or more expansion joints. Given the requirement for resistance to rainwater infiltration, construction joints will be designed to incorporate water bars/stops. As far as is reasonably practicable, construction and expansion joints will be specified to avoid spanning across infilled voids. This is to avoid lines of weakness within the spanning structures and the potential for differential movement across joints.

3.4.41 The proposed cap comprises a reinforced concrete slab spanning over infilled voids and other ponds complex structures, with a sub-base layer of crushed out-of-scope demolition arisings over infilled voids to provide an adequately flat

[24] The concrete removed may be disposed of within the ponds voids as infill material, but they would not then be in direct contact with groundwater.

surface for constructing the cap, including blinding concrete. Standard civil engineering design principles will be applied during detailed design to minimise degradation processes ensure its long-term resistance to surface water infiltration. Detailed design considerations include the thickness profile of the cap, detailing of the reinforcing and potential for partial substitution of ordinary Portland cement with alternative binders.

3.4.42 Additional improvements to the cap design that have been considered include:

- The use of impermeable liners or similar; and
- A thicker cap, or the use of intrusion barriers such as large boulders, or the use of a visual warnings such as inclusion of a bright red layer (red being typically used as a warning).

3.4.43 The preferred option is for a reinforced concrete cap without an underlying material layer (other than blinding concrete) to limit infiltration. Similarly, it is not proposed that measures to mitigate inadvertent human intrusion (over and above the robust concrete cap itself) are incorporated in the capping. These various measures would introduce construction complexities and potentially be detrimental to cap performance if implemented beneath the concrete cap. It would be easier to do these just prior to any site landscaping and eventual release from environmental permitting. These will remain options that could be used as part of the works to achieve the site end state prior to eventual release of the site.

3.4.44 The cap is expected to be around 225 mm thick, with minor variations, and thinner in some areas around the edges. If radiological characterisation shows that the underlying contamination would give rise to local surface dose rates that are too high, then this would likely be addressed by means such as the use of thicker blinding concrete, a thicker sub-base, thicker out-of-scope infill beneath the under-side of the cap, and/or further decontamination of ponds structures.

Cap Extent

3.4.45 The proposed extent of the cap has been subject to a process of optimisation considering the following factors:

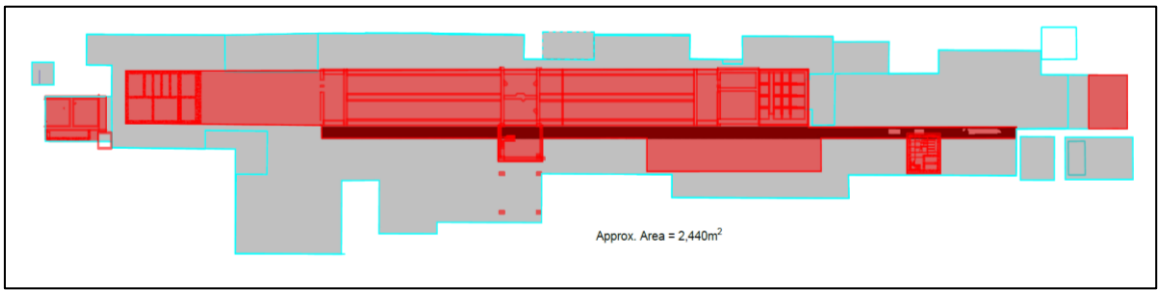
- whether contamination may have penetrated those ground level concrete floor slabs that are located beyond a “core” cap footprint (**Graphic 3.13**);
- whether an area is connected to or disconnected (and distant) from the “core” capping area;
- whether the volume of radioactive waste generated, if a specific ground level feature were to be completely decontaminated or removed rather than capped, would be significant; and
- whether the volume of concrete required, if an area were to be covered by the cap, would be significant.

3.4.46 A more rectangular cap is preferred because this:

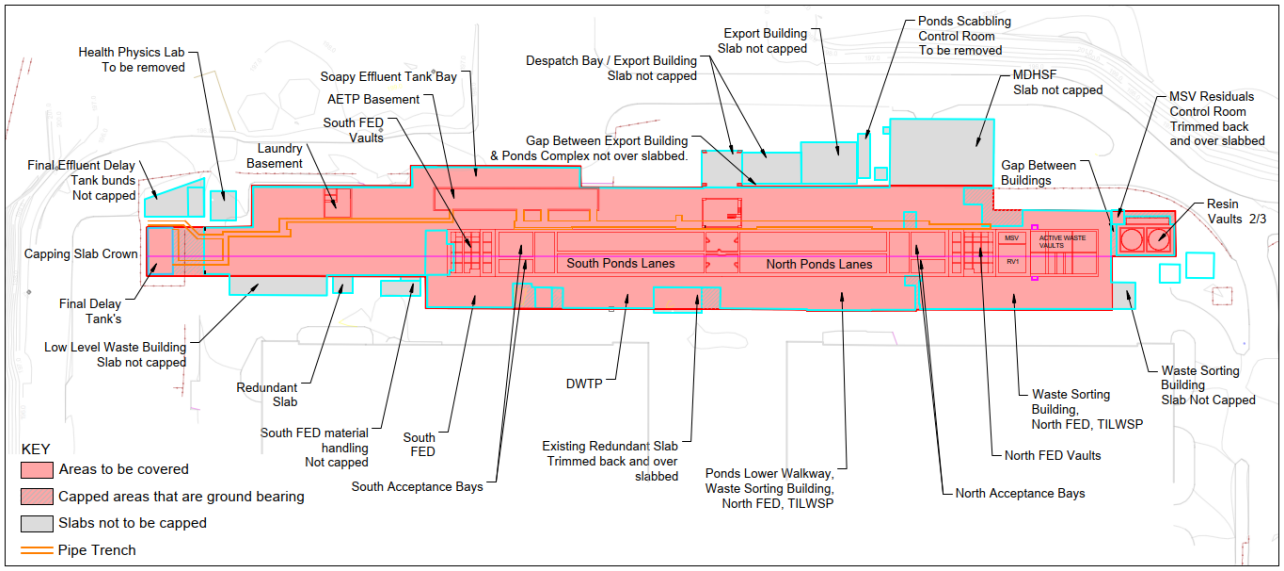
- Reduces the risk of cracking by providing a more uniform outline;

- Allows for even falls across its width and along its length[25];
- Reduces the number of cap perimeter drainage channel runs required;
- Simplifies the reinforcement design; and
- Simplifies edge protection / barriers.

3.4.47 The proposed cap extent is shown in **Graphic 3.14**.



Graphic 3.13 Minimum cap extent considered



Graphic 3.14 Proposed cap extent

3.4.48 There would be no benefit in further extending any capping system over the parts of the Disposal Area well outside the footprint of the ponds complex shown above. The radioactively contaminated redundant sub-surface infrastructure in between the reactor buildings and to the south of Reactor 1 (see **Graphic 3.12**) are already sufficiently protected by overlying roadways and hard-standings and have a very low radioactive inventory.

Drainage design

3.4.49 The current surface water drainage from the ponds complex goes to the site's main storm drain. This flows, via an oil separator, around the south of the National Grid switching compound to a pumping station from where the collected water is

[25] The crossfall on the cap is limited to a minimum slope of 1:60 to ensure positive run-off of water and to prevent ponding.

pumped to Llyn Trawsfynydd. The proposal is that drainage from the cap over the ponds complex footprint will continue to discharge to this existing drainage system, which as now will discharge to Llyn Trawsfynydd. There will be no increase in the volume of water discharging to the lake. This strategy has been approved by the Sustainable Drainage Systems Approval Body (SAB) (June 2022, reference: 0223/22/SUDS). The discharge from the pumping station to the lake is covered by a permit under Environmental Permitting Regulations[6] which imposes limits on suspended solids, pH, and other matters.

3.4.50 Surface water runoff being collected for use on site is not considered to be an option. There is no demand for reuse of grey water within the site and the remaining industrial processes on site are highly controlled and complex and are not suited to this type of reuse.

3.4.51 Surface water runoff from the cap cannot be directed to infiltrate the ground at the present time (though it may be an option in the far future prior to release of the Trawsfynydd site from environmental permitting). This is for a variety of reasons, including the presence of existing ground contamination in some locations and the presence of underground structures and services.

Works prior to release of the site from regulatory control

3.4.52 Additional measures to minimise water infiltration (such as use of impermeable liner on top of the cap but below any landscaping) and/or minimise the risk of future intrusion may be implemented prior to release of the site. These are measures that are simpler to implement and will be more effective than equivalent measures that could, in principle, be implemented now. The decision whether to implement such measures will be made by the site owner/occupier and the regulators at that time. These measures are not necessary in order for the Proposed Disposals to comply with regulatory radiological impact limits (e.g. annual radiation doses) but are potential improvements for consideration prior to site release in the future.

4. Regulatory Context

4.1.1 This Chapter provides details on regulatory regimes that apply to the proposal for the demolition, infilling, and capping of the ponds complex and associated works. This section is not intended to be comprehensive in either listing all the controls and regulations that apply or in describing the full provisions of each piece of legislation. Further information on specific regulations can be found within other chapters of this Environmental Statement.

4.2 Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations (As Amended) 1999[26]

4.2.1 The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations (as amended) 1999[26] (EIADR) is a legal instrument that, in general, requires the environmental impact of decommissioning nuclear power stations, and other nuclear reactors, to be considered in detail before the decommissioning project can be granted consent to commence.

4.2.2 However, the specific requirements on the decommissioning project depend on whether the project started before 19th November 1999 (when EIADR came into force) or after:

- Decommissioning projects starting after 19th November 1999 require consent to commence from the ONR[27] before the project can begin, and must then comply with the conditions of that consent; and
- Decommissioning projects that started before 19th November 1999 did not need explicit EIADR consent to commence, as they have deemed consent.

4.2.3 Decommissioning at Trawsfynydd started before 19th November 1999 so commencement of its decommissioning did not require consent from ONR. However, if any decommissioning project, regardless of when it commenced, is subject to a change or extension that may have a significant adverse effect on the environment, then under Regulation 13 of EIADR the nuclear site licence holder is required to seek a determination from ONR as to the next steps. The next steps could range from nothing further required to be done under EIADR through to the decommissioning project must cease until a new consent, following a new application with a new Environmental Impact Assessment, is granted by ONR.

4.2.4 The proposed change to the radiological end state for the Trawsfynydd ponds complex and adjacent areas have been considered by the Applicant under

[26] Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999. [Online] Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made [Accessed 03 April 2024].

[27] In a number of cases, consent was granted prior to 2014 when ONR was still part of the Health and Safety Executive (HSE) and therefore the consent documents refer to HSE, rather than ONR.

Regulation 13 of EIADR[26]. No further consent processes have been required by ONR under EIADR[26].

4.3 Environmental Permitting (England and Wales) Regulations (As Amended) 2016[6]

4.3.1 Trawsfynydd site has an Environmental Permit (issued by NRW) which will continue to be complied with during implementation of the Proposed Development. However, this permit must be amended to allow the "radioactive waste disposals" (in permitting terms) to proceed.

4.3.2 Schedule 22 of the Environmental Permitting Regulations[6] defines and sets the regulatory framework for "groundwater activities". Broadly speaking (and subject to exceptions), a groundwater activity involves the direct or indirect discharge of pollutants to groundwater. The regulator (NRW in this case) must take all necessary measures:

a) to prevent the input of any hazardous substance (including radionuclides) to groundwater; and
b) to limit the input of non-hazardous pollutants to groundwater so as to ensure that such inputs do not cause pollution of groundwater.

4.3.3 Schedule 23 of the environmental permitting regulations defines and sets the regulatory framework for "radioactive substances activities". For nuclear licensed sites, these are activities involving the disposals of radioactive wastes on or from the premises. Schedule 23 provides the regulatory framework for permitted discharges of radioactive effluent or gases (including particulates) to the aquatic or air environments.

4.3.4 In 2018 the underlying EC Directive was amended to include a definition of 'backfilling', which includes any operation where suitable non-hazardous waste is used for reclamation in excavated areas or for engineering in landscaping. This does not include backfilling with radioactive waste for disposal, which is addressed through Schedule 23 of the Environmental Permitting Regulations[6].

4.3.5 The associated Transboundary Radioactive Contamination (Wales) Direction 2021[28] was made for the purpose of ensuring that NRW considers whether plans to dispose of radioactive waste are liable to result in the radioactive contamination of notifiable countries that would be significant from the point of view of health or the environment. This consideration must happen before NRW determines an Environmental Permit application involving the implementation of a plan to dispose of radioactive waste[29]. In respect of the present proposal, the Applicant's view is that no transboundary consideration is required.

[28] The Transboundary Radioactive Contamination (Wales) Direction 2021. [Online] Available at: https://www.gov.wales/transboundary-radioactive-contamination-wales-direction-2021-html [Accessed 03 April 2024].

[29] The same consideration will be required before NRW determines an application to vary such a permit, unless the proposed variation will not increase any authorised limits placed on radioactive waste disposal activities.

4.4 Nuclear Installations Act (as amended) 1965[30]

4.4.1 This Act provides for regulation of nuclear sites which operate nuclear reactors (including sites in the process of installing or decommissioning reactors) or processes ancillary to operation of a nuclear reactor. Relevant sites are required to have a nuclear site licence issued by the ONR or the Secretary of State. Once a licence has been issued, the licensee's period of responsibility and the provisions of the Act continue to apply until, in the opinion of ONR, there has ceased to be any danger from ionising radiation from anything on the site. After delicensing under this Act, the Health and Safety Executive (HSE) will then regulate the health and safety of the workforce in line with other industries and the environmental regulators will continue to regulate until such time as the environmental permit / authorisation is surrendered.

4.5 Proportional Regulatory Control (PRC)

4.5.1 Working with regulators and the Nuclear Decommissioning Authority (NDA), Department for Energy Security and Net Zero (DESNZ)[31] has identified that, in the final stages of decommissioning and clean-up, former nuclear sites should be regulated in a more proportionate way than has been required in the past. A discussion paper on proportionate regulatory control (PRC), in particular the arrangements for exiting nuclear third-party liability and delicensing nuclear sites, was published by Government in November 2016. This was followed by a public consultation in 2018.

4.5.2 The Government subsequently set out its intention to amend the Nuclear Installations Act (1965)[30] and other relevant legislation. The new regulatory regime referred to as PRC will enable the following:

- The nuclear site licence will end when the hazard diminishes such that the "no danger" from ionizing radiation criteria is met, and the HSE will then regulate the health and safety of the workforce in line with other industries;
- The "nuclear liability" requirements will end when certain exclusion criteria are met; and
- The environmental regulators will continue to regulate until such time as the environmental permit / authorisation is surrendered.

4.5.3 To achieve these changes, significant changes to legislation have recently taken place via the Energy Act 2023[32] to facilitate transfer between regulatory regimes and to eliminate any gaps in regulation.

[30] Nuclear Installations Act 1965. [Online] Available at: https://www.legislation.gov.uk/ukpga/1965/57 [Accessed 03 April 2024].

[31] Formerly Department for Business, Energy, and Industrial Strategy (BEIS).

[32] Energy Act 2023. [Online] Available at: https://www.legislation.gov.uk/ukpga/2023/52/contents/enacted [Accessed 03 April 2024].

4.6 Ionising Radiations Regulations 2017

4.6.1 These regulations impose duties on employers to protect both employees and other persons against ionising radiation arising from working with or near sources of radiation. Every employer must, in relation to any work with ionising radiation that it undertakes, take all necessary steps to restrict so far as is reasonably practicable the extent to which its employees and other persons are exposed to ionising radiation.

4.6.2 The regulations impose limits on the doses of ionising radiation which employees and other persons may receive. The regulations also require the use of "designated" work areas, and the establishment and use of arrangements for the classification and monitoring of workers.

4.6.3 The regulations also:

- Require employers to make a prior assessment of radiological risks and hazards;
- Require employers to take all reasonable steps to restrict as far as is reasonably practicable the extent to which persons are exposed to ionising radiation;
- Require respiratory protective equipment used in work with ionising radiation to conform with agreed standards;
- Require all personal protective equipment and other controls to be regularly examined and properly maintained;
- Require employers to prevent and limit the consequences of identifiable radiation accidents; and
- Require in certain circumstances the preparation of contingency plans for radiation accidents which are reasonably foreseeable.

4.7 Conventional Safety

4.7.1 Safety is the priority during the operation of any nuclear power station site, and this includes the decommissioning phase. Decommissioning works on nuclear licensed sites are regulated by the ONR for conventional safety such as construction work and manual handling. The main regulations relevant to the Proposed Development are:

- Health and Safety at Work Act 1974[33] which makes provision for securing the health, safety, and welfare of persons at work and other persons who may be affected. It places a duty on both employers and employees;

[33] Health and Safety at Work etc. Act 1974. [Online] Available at: https://www.legislation.gov.uk/ukpga/1974/37/contents [Accessed 03 April 2024].

- The Construction (Design and Management) Regulations 2015[34] cover the management of health, safety and welfare when carrying out construction and/or demolition;
- Lifting Operations and Lifting Equipment Regulations 1998[35] concern the control of lifting operations and use of associated lifting equipment;
- The Manual Handling Operations Regulations 1992[36], which require employers to protect employees from the risks of injury from the manual handling of loads at work;
- Control of Noise at Work Regulations 2005[37] place duties on employers to eliminate or reduce any risk in respect of exposure of noise to its workers;
- Control of Vibration at Work Regulations 2005[38]puts in place actions for employees to take to protect workers from risk to health from vibration;
- Control of Substance Hazardous to Health Regulations 2002[39] duties are imposed on employers to protect employees and other persons who may be exposed to substances hazardous to health. Duties are also imposed on employees concerning their own protection from such exposure; and
- The Control of Asbestos Regulations 2012[40] set out responsibilities and duties regarding the management of asbestos.

Health and Safety at Work Act 1974[33]

4.7.2 This Act is the primary piece of legislation covering occupational health and safety which provides a legislative framework to promote and encourage high standards of health and safety at work. It is an enabling Act, which means that other regulations can be created to deal with specific health and safety issues, but breaches of those regulations are punishable under the provisions of this Act. This Act places duties on employers to ensure, so far as is reasonably practicable, the health, safety and welfare of their employees and anyone else who may be affected by their business activities. It also places duties on employees.

[34] The Construction (Design and Management) Regulations 2015. [Online] Available at: https://www.legislation.gov.uk/uksi/2015/51/contents/made [Accessed 03 April 2024].
[35] The Lifting Operations and Lifting Equipment Regulations 1998. [Online] Available at: https://www.legislation.gov.uk/uksi/1998/2307/contents/made [Accessed 03 April 2024].
[36] The Manual Handling Operations Regulations 1992. [Online] Available at: https://www.legislation.gov.uk/uksi/1992/2793/made [Accessed 03 April 2024].
[37] The Control of Noise at Work Regulations 2005. [Online] Available at: https://www.legislation.gov.uk/uksi/2005/1643/made [Accessed 03 April 2024].
[38] Control of Vibration at Work Regulations 2005. [Online] Available at: https://www.legislation.gov.uk/uksi/2005/1093/contents/made [Accessed 03 April 2024].
[39] The Control of Substances Hazardous to Health Regulations 2002. [Online] Available at: https://www.legislation.gov.uk/uksi/2002/2677/contents/made [Accessed 03 April 2024].
[40] The Control of Asbestos Regulations 2012. [Online] Available at: https://www.legislation.gov.uk/uksi/2012/632/contents/made [Accessed 03 April 2024].

The Construction (Design and Management) Regulations 2015[34]

4.7.3 The 2015 CDM Regulations set minimum safety and health requirements at temporary or mobile construction sites. These regulations also apply to demolition or dismantling activities. Larger projects are notifiable to the regulator (HSE). The Proposed Development will fall into this category.

4.7.4 A designer or contractor appointed to work on a project must have appropriate skills, knowledge, and experience, and if they are an organisation, the organisational capability necessary to fulfil their role in ensuring the health and safety of any person affected by the project. Every person involved in construction has a duty to co-operate with and co-ordinate their activities with other duty holders to ensure, so far as is reasonably practicable, the health and safety of the project personnel.

4.7.5 A person working on a project must report to the person in charge anything they are aware of on the project which is likely to endanger their own health or safety or that of others.

4.7.6 The regulations also specify general requirements for all construction sites, including about good order and site security.

Lifting Operations and Lifting Equipment Regulations 1998[35]

4.7.7 These regulations concern the control of lifting operations and use of associated lifting equipment. Lifting equipment may be any equipment used to move loads and includes accessories such as slings, chains, anchors, and hooks. Duties of the employer under the regulations include ensuring the correct positioning and installation of lifting equipment, and the use of relevant and accurate marking (e.g. of the safe working load).

The Manual Handling Operations Regulations 1992[36]

4.7.8 These regulations require employers to avoid the need for hazardous manual handling as far as reasonably practicable; assess the risk of injury from any hazardous manual handling that cannot be avoided; and reduce the risk of injury from hazardous manual handling as far as reasonably practicable.

Control of Noise at Work Regulations 2005[37]

4.7.9 These regulations impose duties on employers to protect both employees who may be exposed to risk from exposure to noise at work and other persons at work who might be affected by that work. The regulations introduce new action and limit values and amongst other things require employers to:

- Identify which of their employees may be at risk from noise;
- Provide employees with hearing protection if it is not possible to reduce the noise exposure enough by using other means;
- Provide employees with instruction and training;
- Designate areas of the workplace as a hearing protection zone as appropriate; and
- Carry out health surveillance of employees where there is a risk to health.

4.7.10 Wherever the Applicant's employees, its contractors or site visitors may be exposed to noise above the upper exposure action values, and where sound exposure cannot be further reduced, 'Hearing Protection Zones' are designated, and hearing protection must be worn.

Control of Vibration at Work Regulations 2005[38]

4.7.11 These regulations apply to a variety of workers whose work involves long hours using vibrating equipment for example, hand-held power tools. The regulations impose strict limits on the length of time employers can expose workers to vibration and apply to both hand-arm and whole-body vibration. Amongst other things, the regulations require employers to:

- Undertake a risk assessment;
- Eliminate or, where elimination is not reasonably practicable, reduce exposure to vibration to as low a level as is reasonably practicable;
- Introduce vibration limit values;
- Introduce vibration action values;
- Implement health surveillance of workers exposed or likely to be exposed to vibration at or above an exposure action value; and
- Provide instruction and training.

Control of Substance Hazardous to Health Regulations 2002[39]

4.7.12 Under these regulations, employers must seek to prevent exposure to substances hazardous to health, such as dust. Where exposure cannot be prevented it must be demonstrated that it is adequately controlled. The HSE have published exposure limits for hazardous substances which must be complied with.

The Control of Asbestos Regulations 2012[40]

4.7.13 The regulations set out responsibilities and duties regarding the management of asbestos, including the preparation of a location and risk assessment, a risk management plan, and a system of notification prior to the commencement of work which could result in exposure to asbestos.

4.7.14 The regulations establish a framework which identifies three categories of asbestos work:

- Licensable (medium to higher risk work);
- Notifiable non-licensable (medium to low-risk work); and
- Non-notifiable non-licensable (very low risk work).

4.7.15 Medium and higher risk work that involves or disturbs asbestos must only be undertaken by licensed asbestos contractors. Any licensable and notifiable non-licensable work with asbestos will be notified to the ONR at least 14 days before the work commences.

4.7.16 Existing company arrangements are in place to comply with these regulations. Key arrangements include appointment of 'Asbestos Competent Persons' to control work potentially involving asbestos and to advise on assessment of associated risks. Any work completed by a licensed contractor is supported by corporate asbestos analysts with regards to air monitoring and clearance activities.

4.7.17 In respect of the Proposed Development, all accessible asbestos will be removed under these arrangements prior to the development (demolition) proceeding.

4.8 Other Legislation

The Radiation (Emergency Preparedness and Public Information) Regulations 2019[41]

4.8.1 These regulations use the concept of a "radiation emergency", as defined in the regulations, to determine whether an off-site emergency plan is required. These regulations apply to any work with ionising radiation which involves radioactive substances containing more than the quantities specified in the regulations. If the regulations do apply, then the operator must undertake an assessment of the potential for a "radiation emergency".

4.8.2 For the Trawsfynydd site a "radiation emergency" is not possible so no off-site emergency plan is required. The potential for a radiation emergency at Trawsfynydd will not be affected by the Proposed Development. This is an example of nuclear industry legislation where the same regulations apply to all sites, but what they mean in practice varies considerably from site to site.

Environmental Protection Act 1990[42]

4.8.3 Subject to various exemptions, the deposit, keeping, treatment or disposal of controlled waste in or on land requires a permit. Provisions are included which require those who hold a permit to be competent. In most cases this requires the possession of a Certificate of Technical Competence from the Waste Management Industry Training and Advisory Board.

4.8.4 Section 33 of the Environmental Protection Act prohibits the deposit, treatment and disposal of waste without an appropriate permit (or exemption). It is also prohibited to dispose of waste in a manner likely to cause pollution to the environment or harm to human health.

4.8.5 Section 34 of the Environmental Protection Act imposes a statutory 'duty of care' on all businesses that are involved with the production, importing and handling of waste to ensure that the waste arising from their premises is adequately stored, correctly transported, transferred to authorised persons and disposed of or treated lawfully. The Environmental Protection (Duty of Care) Regulations (as amended) 1991 impose the requirements of Section 34 for the safe disposal of waste.

[41] The Radiation (Emergency Preparedness and Public Information) Regulations 2019. [Online] Available at: https://www.legislation.gov.uk/uksi/2019/703/contents/made [Accessed 03 April 2024].

[42] Environmental Protection Act 1990. [Online] Available at: https://www.legislation.gov.uk/ukpga/1990/43/contents [Accessed 03 April 2024].

The Hazardous Waste (Wales) Regulations 2005[43]

4.8.6 These regulations place duties on anyone who produces, transports, recovers, or disposes of hazardous waste. Waste is generally considered to be hazardous if the substances it contains are harmful to human health or the environment. However, radioactive waste is subject to the provisions of the Environmental Permitting Regulations and is outside the scope of these regulations. In respect of the Proposed Development, all hazardous waste will have been removed prior to the development commencing.

Flood and Water Management Act 2010[44]

4.8.7 Schedule 3 of the Flood and Water Management Act 2010 introduced sustainable drainage system (SuDS) requirements for new developments in Wales. Under this Act, construction work (anything done in connection with, or in preparation for, the creation of a building/structure) with drainage implications needs to have approval by an approving body[45] before construction work can begin. In respect of the present proposal, the concrete cap drainage design has received approval.

Reservoirs Act (as amended) 1975[46]

4.8.8 In Wales, reservoirs that can hold 10,000 m³ or more of water are regulated under the Reservoirs Act (as amended) 1975. The “undertaker” (the legal term for the reservoir owners or operators) of these reservoirs in Wales are required to register them with NRW, which is the enforcement authority in Wales. The Applicant is the undertaker in respect of all Llyn Trawsfynydd dams.

4.8.9 Reservoirs are designated as high-risk reservoirs where, in the event of an uncontrolled release of water, human life could be endangered. All Llyn Trawsfynydd dams have been designated by NRW as high risk. The management of high-risk reservoirs must always be overseen by a Supervising Engineer, and an Inspecting Engineer must inspect the reservoir at intervals not exceeding 10 years. The Supervising Engineer provides the undertakers and NRW with an annual statement detailing the overall behaviour of the reservoir and any actions taken, or not taken, by the undertakers.

[43] The Hazardous Waste (England and Wales) Regulations 2005. [Online] Available at: https://www.legislation.gov.uk/uksi/2005/894/contents/made [Accessed 03 April 2024].

[44] Flood and Water Management Act 2010. [Online] Available at: https://www.legislation.gov.uk/ukpga/2010/29/contents [Accessed 03 April 2024].

[45] Sustainable Drainage Approval Body (SAB).

[46] Reservoirs Act (as amended) 1975. [Online] Available at: https://www.legislation.gov.uk/ukpga/1975/23/contents [Accessed 03 April 2024].

Well-Being of Future Generations (Wales) Act 2015[47]

4.8.10 The Well-Being of Future Generations (Wales) Act 2015 requires public bodies in Wales to consider the long-term impact of their decisions with a view to avoiding or minimising persistent problems such as poverty, health inequalities and climate change in a way that accords with the sustainable development principle. It has seven wellbeing goals: a prosperous Wales; a resilient Wales; a more equal Wales; a healthier Wales; a Wales of cohesive communities; a Wales of vibrant culture and thriving Welsh language; and a globally responsible Wales. Under each of these goals there are several objectives. Although the Applicant is not considered as a public body under this Act, it is aware of the duty and responsibility to consider the factors above throughout the application.

[47] Well-Being of Future Generations (Wales) Act 2015. [Online] Available at: https://www.legislation.gov.uk/anaw/2015/2/contents/enacted [Accessed 03 April 2024].

Andrew Farrow
Director of Environment
Cyfarwyddwr yr Amgylchedd

CYNGOR Sir y Fflint Flintshire COUNTY COUNCIL

Ms Angharad Rayner
Site Director
Safle Trawsfynydd
Blaenau Ffestiniog
Gwynedd
LL41 4DT

Your Ref / Eich Cyf: 198/SNPA/AR/05650

Our Ref / Ein Cyf: NP5/73/287J

Date / Dyddiad: 13/04/2022

Ask for / Gofynner am: Mr RW Williams

Direct Dial / Rhif Union: 01286 679833

E-mail: robinwynnewilliams@gwynedd.gov.uk

Dear Ms Rayner

Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 - Regulation 5 Screening Opinion
Proposed Demolition & disposal of the Trawsfynydd Ponds complex, disposal of other minor structures, related capping and drainage works, and installation of groundwater monitoring boreholes – Trawsfynydd Nuclear Power Station Decommissioning Site

Referring to your PA – Ms Delia Taylor's e-mail dated 26 January requesting a formal screening opinion under the Environmental Impact Assessment regulations for the development described above.

Under Regulation 5 and using the assessment criteria set out in Schedule 2 & 3 of the Regulations, it is concluded that the likely impact of the development on the environment **will** require the submission of an Environmental Statement. This screening opinion will be placed upon the Planning Register at the Authority's Office.

Yours sincerely,

Robin Wynne Williams
Senior Planning Officer (Minerals and Waste)

Ar ran Gwasanaeth Cynllunio Mwynau a Gwastraff Gogledd Cymru /
On behalf of the North Wales Minerals and Waste Planning Service

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The Council welcomes correspondence in Welsh or English
Mae'r Cyngor yn croesawy Gohebiaeth yn y Gymraeg neu'r Saesneg

Working in Partnership with:
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CYNGOR Sir Ddinbych Denbighshire COUNTY COUNCIL
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CYNGOR SIR YNYS MÔN ISLE OF ANGLESEY COUNTY COUNCIL
wrexham COUNTY BOROUGH COUNCIL CYNGOR BWRDEISTREF SIROL wrecsam

Appendix 1B – ENPA Scoping Opinion

Andrew Farrow
Director of Environment
Cyfarwyddwr yr Amgylchedd

CYNGOR Sir y Fflint Flintshire COUNTY COUNCIL

Ms Angharad Rayner
Site Director
Safle Trawsfynydd
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Your Ref / Eich Cyf: 198/SNPA/AR/05662
Our Ref / Ein Cyf: NP5/73/287M
Date / Dyddiad: 23/03/2023
Ask for / Gofynner am: Mr RW Williams
Direct Dial / Rhif Union: 01286 679833
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Dear Ms Rayner,

Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 - Regulation 14 Scoping Opinion
Proposal: The Demolition & Disposal of the Trawsfynydd Site Ponds Complex, Disposal of other minor structures and related capping and drainage works
Location: Trawsfynydd Nuclear Power Station, Blaenau Ffestiniog, LL41 4DT

Thank you for your correspondence of 15th September requesting the Authority's Scoping Opinion for the above proposal together with further information submitted on the 02/02/2023. The LPA are satisfied that the request meets the requirements of the regulation 14 (2) of the regulations and please find enclosed the Authority's Scoping Opinion for the proposal described.

In adopting this Scoping Opinion, the Planning Authority has considered the requirements of the 2017 regulations, Welsh Office Circular 11/99: Environmental Impact Assessment, as well as current best practice towards preparation of an ES. In accordance with the 2017 regulations, the MPA has consulted on the report and the responses received from the consultation bodies have been taken into account in adopting this Opinion and considered the specific characteristics of the proposal, the type of development and the environmental features likely to be affected by the development. The application should be assessed and referred to within the Environmental Statement when the planning application is submitted.

This Scoping Opinion seeks to ensure that any Environmental Statement submitted with respect to a planning application for the development proposal described in the scoping

request includes information that is reasonably required to assess the environmental effects, and allow a determination to take place. The statement must address the baseline conditions, likely significant impacts, the probability of effects and the proposed mitigation measures. The information provided should be that which is necessary to demonstrate the risks, likelihood of occurrence, likelihood of any significant impact and an outline of the main alternatives studied by the applicant. Please note that further information may still be required once the statement has been submitted.

The Authority broadly agrees that the Scoping Report addresses the main issues for consideration:

- **Biodiversity**
- **Geo-environmental Impacts and Surface Water Quality**
- **Flood Risk and Drainage**
- **Long Term Radiological and Non-Radiological Impacts**
- **Air Quality**
- **Noise and Vibration**
- **Traffic and Transport**
- **Historic Environment**
- **Landscape and Visual Impact Assessment**
- **Socio Economic**
- **Cumulative Effects**
- **Alternatives**

The following will consider the content of the Scoping Report as submitted and will outline the matters which require modification, augmentation or clarification as part of any subsequent planning application and environmental statement.

1. Environmental Impact Assessment Approach

The MPA is generally supportive of the approach outlined in the Scoping Report. The ES should include a chapter setting out the overarching methodology for the assessment, which clearly distinguishes effects that are 'significant' from 'non-significant' effects. Any departure from that methodology should be described in individual aspect assessment chapters. Where professional judgement has been applied this should be clearly stated. The ES topic chapters should report on any data limitations, key assumptions and difficulties encountered in establishing the baseline environment and undertaking of environmental effects. The applicants should satisfy themselves that the ES includes all the information outlined in Schedule 4 of the 2017 Regulations. In addition, the Applicant should ensure that the Non-Technical Summary includes a summary of all the information included in Schedule 4. The applicant should consider a structure that allows the author of the ES and the MPA to readily satisfy themselves that the ES contains all the information specified under Regulation 17 and Schedule 4 of the 2017 Regulations (Information for inclusion in Environmental Statements). Cross refer to the requirements in the relevant sections of the ES, and include a summary after the Contents page that lays out all the requirements from the Regulations and what sections of the ES they are fulfilled by.

2. Proposed Development

The Environmental Statement should include a description of the development, the site, in terms of location, physical features, land use and should identify sensitive receptors within the locality. It should also include a description of surroundings and proposed development together with likely hours of operation / construction phase of the development, consideration will need to be given to the disposal/treatment/recovery/reuse of radioactive wastes and other waste streams which will be produced as referenced within the report. Consideration should be taken of the proposed decommissioning and site restoration collectively approved under planning permission and how / if this differs to the original concept but complements the long term decommissioning / restoration aims. This should be a methodology as to how the site is to be maintained throughout the decommissioning process and how upkeep will not result in the site becoming derelict over time.

3. Biodiversity

Protected Sites

As noted within the Scoping report (Baseline conditions 5.3), there are various protected sites within various distances to site. Table 5.7 - Potential biodiversity effects requiring assessment, indicates which sites are to be screened in/out. While the Authority broadly agree with the assessment presented, running water has been screened in due to the potential for contamination of off-site watercourses. As such, it should be noted that hydrologically linked protected sites, and those with water dependent mobile features may be impacted by the proposals (depending on the detailed assessment of ground and surface water), as part of any planning application submitted, avoidance and mitigation measures may be required to safeguard protected sites. The Local Authority will need to carry out a test of likely significant effects under regulation 61 of the Conservation of Habitats and Species Regulations 2010 (as amended). This will be done in consultation with NRW. If the assessment concludes there is likely to be a significant effect upon the conservation status of these sites, the Local Authority will need to carry out an Appropriate Assessment under the Regulations.

Protected Species

It is noted; the assessment presented in Section 5 ‘Biodiversity’ with regards to bats, great crested newts, otters, water voles, red squirrels, pine martens, dormice and Invasive Non-Native Species. The majority of these species have been scoped out because they were not identified on site. Considering the location of the proposed work within an area of hard standing and the nature of the work, we consider these proposals to have low likelihood of direct impact on protected species. As noted in the Protected Sites section, contamination of watercourses may impact on protected species in the vicinity, and this should be considered in future assessments. As bats have been scoped in, there will be a requirement to produce further information about how the delivery of these proposals will avoid any negative impacts on this species. As this work is not located directly where the bats are roosting, we would expect the main focus to be on commuting and foraging individuals. Any assessment should include the prevention of additional, inappropriate lighting of adjacent habitats and also the reduction of existing lighting where possible. Any lighting mitigation for bats will likely benefit other species, but attracting further species into the site would not be desirable

The applicant should be mindful that The Snowdonia National Park have a duty under Part 1 Section 6 of the Environment (Wales) Act 2016, TAN 5, LDP policies and biodiversity SPG 6 – Nature Conservation and Biodiversity, to ensure that there is no net loss of biodiversity or unacceptable damage to a biodiversity feature as part of the planning process. Biodiversity enhancement measures are discussed further within the pre-application response.

4. Geo-environmental Impacts and Surface Water Quality

The Authority disagrees with elements of the Scoping Report relating to this section. In particular the scoping out of certain receptors, particularly with the hydrogeological elements references in Table 6.6 and Table 6.8. We do not agree with the scoping out of the effects from impacts on groundwater behaviours. We advise that it is too early a stage to scope out such an important element. The breakage of hardstanding and excavation works (around pipes for example) may result in greater infiltration and could mobilise contaminants.

Notwithstanding, I am aware that NRW as consultee with in the Planning process and regulator of the site's Environmental Permit have had several discussions with Magnox around this topic and the importance of groundwater monitoring. Further documents have been provided as part of the Scoping submission including documents *DD-MISC-0732 Slide-pack on characterisation and monitoring Birmingham 17-11-22* and *198-SNPA-AR-05670_Request for Scoping Opinion – Further Information_02.02.23*; and there is now recognition of the importance of groundwater monitoring, both during and post-implementation within the scoping process. This is a key requirement due to the degree of uncertainty at the site in the short, medium and long term and the long duration over which activities will be occurring at the wider site. As it is understood there will be many activities occurring at the site which may influence groundwater conditions and that phasing of different works may be subject to change. Therefore, the ES should include an in-combination assessment of engineering works which may interact with groundwater on the site.

It is important to recognise the need to develop meaningful monitoring strategies in support of the application and ES that will be scrutinised and set to operate over many decades to minimise uncertainties as the project progresses. We would welcome the development of a strategized and adaptive monitoring regime and a Water Management Plan (WMP). A WMP would for example identify trigger values and reasonable next steps if particular trigger values were to be exceeded for 3 consecutive quarters etc.

The role of other activities, such as SuDS, and the impacts that these might have on groundwater are not integrated within the scoping assessment (3.5.8). It's our understanding that the ambition for the site is to discontinue pumped discharge to the lake and to use passive SuDS as a means of managing surface storm water and groundwater at the site. Potential effects from these proposals (whether that's relating to changes to the groundwater flow regime or groundwater quality) should be included within the ES.

5. Flood Risk and Drainage

With regards to flood risk, the LPA are satisfied with the content of Section 7 (Flood Risk and Drainage). It is agreed that the application site (red line boundary) is not within an area shown to be at risk of flooding from rivers or sea according to the Flood Map for Planning (FMfP). The FMfP represents better and more up-to-date information on areas at flood risk

than the Development Advice Maps (DAM) accompanying the current TA15: Development and Flood Risk (2004).

NRW's remit, with regards to advising on flood risk and suitability of any assessment relates to flooding as shown on the FMfP/DAM and any associated main rivers or the sea. We note that the proposal is unlikely to have the potential to cause significant environmental effects in terms of flood risk. However, please be aware that the Flood and Water Management Act 2010 created Lead Local Flood Authorities (LLFA-Local authorities in Wales). This was to enable LLFAs to lead on managing local flood risks i.e. risks of flooding from surface water, ground water and ordinary (smaller) watercourses. As such we would advise that the LLFA - Gwynedd Council in this instance are consulted on this section (7) of the EIA process. Gwynedd Council also act as the Sustainable Drainage Approval Body (SAB) and it is noted in section 4 (Other Consents) that approval was obtained in May 2022. We therefore agree with the Summary (7.3.38 to 7.3.43) in that the key risk to the Proposed Development relates to surface water risk. As stated above, whilst we are satisfied with the content of section 7, we would advise that the LLFA should be the appropriate body to comment and advise on the management of flooding from this source. We note and accept the commentary made on the (unlikely) failure of the dams retaining Llyn Trawsfynydd. For completeness and future reference, we would advise that the table 7.3 footnote 10 that the Climate change guidance has been updated:- Climate change allowances and flood consequence assessments | GOV.WALES

6. Long Term Radiological and Non-Radiological Impacts

The information within the scoping report relating to the radiological impacts (chapter 8) have been reviewed. Notwithstanding comments on Geo-environmental Impacts and Surface Water Quality (which also apply to radiological issues), the receptors identified appear to be appropriate and we concur with the need for the further assessments proposed. The approach to the long-term radiological assessments is in line with what NRW would expect to support the permit application under GRR (Guidance on Requirements for Release of Nuclear Sites from Radioactive Substances Regulation) and NRW have indicated that they are in technical discussions with Magnox on the validity of the models being used.

It is also noted that a Health Impact Assessment as advocated within TAN 21 to ensure that human health issues are not overlooked is to be undertaken. It is trusted that the Health Impact Assessment will feed in to chapters of the ES correctly in accordance with my comments noted within section 1 of this opinion Environmental Impact Assessment Approach and to comments relating to Duplication and Repetition below.

7. Air Quality

The Authority agrees with the contents of the Scoping report. However, dust control measures should form part of the planning application statements and reference will be included within the pre-app response. I also note that a Health Impact Assessment as advocated within TAN 21 to ensure that human health issues are not overlooked is to be undertaken, and reference to air quality will be included.

8. Noise and Vibration

The Authority is in broad agreement with the contents of the Scoping Report and discussions should be entered with Gwynedd Council Public Protection Service to determine the scope

of a noise and vibration assessment in accordance with that of Construction Noise Assessment BS 5228 ABC Method.

9. Traffic and Transport

Although we have not received a response from either Gwynedd Council Highway Department or Welsh Government as Trunk Road Authority, based on the information provided we believe that the contents of the Scoping report in relation to highway and transport issues to be satisfactory.

10. Historic Environment

The Authority is in broad agreement with the contents of the Scoping Report.

11. Landscape and Visual Impact Assessment

The Authority is in broad agreement with the contents of the Scoping report in relation to the landscape and visual amenity effects. I do however draw your attention to the contents of NRW's response of the 21st October and the matters raised relating to the landscape baseline. To this effect it is suggested that landscape change, mitigation and possible enhancement may be introduced within a Landscape Appraisal document submitted in support of the application.

12. Socio Economic

This is discussed within chapter 14 of the Scoping Report. The Authority is in broad agreement with the contents of the Scoping report, and accept that this can be scoped out. However, socio-economics or socio-cultural considerations and the Welsh language are material planning considerations and will need to be addressed within supporting documentation within the application's submission.

13. Key Planning Policy

The ES should include an assessment of policy which includes consideration of waste and all other material planning considerations. In undertaking a comprehensive assessment informing of compliance with both National and Local policies, legislation and guidance documents this should avoid the need to resubmit the same information under the guise of a Waste Planning Assessment as required by TAN 21. Therefore the chapter should cover what is required as part of a Waste Planning Assessment in being appropriate and proportionate to the nature, size and scale of the development proposed and should provide all of the information necessary for the local planning authority to make a decision on the application. Proposals for developments falling under disposal and recovery operations should explain in the Waste Planning Assessment, set out in Annex B, where the proposal fits within the waste hierarchy and why it represents the best overall environmental outcome.

Any environmental statement should take account of revisions and new guidance, policy or legislation which may be published.

14. Cmulative Impact

The consideration of cumulative impact is an integral part of the EIA process and section 3.5 of the Scoping Report describes both intra-project and inter-project effects. As noted within the Report, this proposal forms a greater goal for final end-state and existing consents will need to be factored for assessment.

15. Alternatives

This is referred to within section 2.9 of the Scoping Report under the heading Proposed Development and is an important part of the EIA process. Regulation 17(d) which requires amongst other considerations; *"a description of the reasonable alternatives studied by the applicant or appellant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the significant effects of the development on the environment;".*

Alternatives should therefore be considered in relation to the Proposed Development with the requirements of Regulation 17 and Schedule 4 of the 2017 Regulations and any reasonable alternatives studied by the applicant should be presented in the ES. The reasons behind the selection of the chosen option should also be provided in the ES, including where environmental effects have informed choices made.

It is worth bearing in mind that under the Conservation of Habitats and Species Regulations 2017 ("the Habitats Regulations") unless it can be clearly shown to the MPA that the project would have no adverse effect of the integrity of any designated sites, it would have to be shown that there is no feasible alternative solution.

For consistency and to avoid confusion and repetition, it is urged that alternatives are discussed comprehensively within the ES with referencing as to relevance to the EIA process and to wider application requirements.

16. Other considerations and advice in preparing both ES and planning application (note there will be cross over between Scoping Opinion and formal Pre-application responses)

Environmental Permit

Noted within Section 4 – Other Consents of the Scoping Report and discussed wider within meetings with Magnox and NRW. It is anticipated that further discussions will ensue as to the timing of both planning and permitting applications and if both planning and environmental permit applications (GRR) are to be staggered or twin tracked. Based on discussions with NRW, the avoidance of unnecessary duplication of control is something the LPA and NRW strive to achieve. However, the EIA process will be subject to both regime applications. As the ES sets out the results of the EIA process; for consistency of decision, the avoidance of doubt and possible legal challenge, it is trusted that the planning application submission including the ES where there are both permitting and planning considerations; that those chapters will be consistent in contents and format.

Duplication and Repetition

Generally, some applications that require the submission of Environmental Statements have contained superfluous information relating to issues that are irrelevant or of little importance

to the proposed development. Competent Authorities, consultees and the public should not have to deal with large volumes of material and repetition which is irrelevant to the decision-making process. It appears that the proposed application will include statements, assessments and information that falls outside the EIA process, such documents will undoubtedly contain overlapping information. To avoid repetition, it is strongly suggested that certain statements and assessments that are required as part of the planning application are amalgamated within the contents of the Environmental Statement with clear referencing stating where to discover the necessary information and what information relates to the different elements of the application. In doing so, it is trusted that this is clearly stated within the contents of the ES.

17. Regulation 14

For the purposes of the requirements of Regulation 14 (4) of the above regulations, the following bodies/individuals were consulted as part of this Scoping Request and are aware that you are intending to submit a planning application which is to be accompanied by an environmental statement. Responses to the consultation are enclosed (No correspondence received from consultees labelled with a *).

SNPA and Gwynedd Council Internal Consultees:-

Ecologist; Natalie Parry – Natalie.Parry@eryri-llyw.cymru
Highways; - francisgerardjonessherrington@gwynedd.llyw.cymru
*Historic Environment Planning Officer; Eleanor Carpenter - eleanor.carpenter@eryri.llyw.cymru
Planning Policy; Sion Roberts - Sion.Roberts@eryri.llyw.cymru
Public Protection (Pollution & Licensing); Mared Llwyd - MaredLlwyd@gwynedd.llyw.cymru
*Drainage SUDS; Rhydian Roberts - rhydianroberts@gwynedd.llyw.cymru

External Consultees

Natural Resources Wales; Tomos Hughes - NorthPlanning@cyfoethnaturiolcymru.gov.uk Tomos.Hughes@cyfoethnaturiolcymru.gov.uk
Welsh Government, Trunk Roads; NorthandMidWalesDevelopmentControlMailbox@Wales.GSI.Gov.UK
CADW; Neil Maylan – cadwplanning@gov.wales Neil.Maylan002@gov.wales
*WelshWater; developer.services@dwrcymru.com DSplanningconsultations@dwrcymru.com DSSABconsultations@dwrcymru.com
*Cyngor Tref Blaenau Ffestiniog - clerc@cyngortrefffestiniog.cymru
*Cyngor Cymuned Trawsfynydd - cyngor.trawsfynydd@gmail.com
*Cyngor Cymuned Ganllwyd- mike.owen4@btopenworld.com

Public and Community Engagement

As part of this Scoping exercise, we have received cautionary interest from the listed Community and Town Councils above. As discussed, public engagement should be undertaken to explain what are the proposed future developments for the site.

For clarity It is encouraged that prior to submission, pre-application discussions are undertaken through the formal process.

I trust that the North Wales Minerals and Waste Planning Service and The Snowdonia

National Park Authority's position is explained above and please do not hesitate in contacting should you wish to discuss any issue further.

Yours faithfully,

Robin Wynne Williams
Senior Planning Officer (Minerals and Waste)

Ar ran Gwasanaeth Cynllunio Mwynau a Gwastraff Gogledd Cymru /
On behalf of the North Wales Minerals and Waste Planning Service

Enc.

Safle Trawsfynydd Site

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Magnox

26 May 2023

Mr Jonathan Cawley
Development Management, Snowdonia National Park Authority
National Park Office
Penrhyndeudraeth
Gwynedd
LL48 6LF

Our Ref: 198/SNPA/AR/05672

Dear Mr Cawley

DEMOLITION & DISPOSAL OF THE TRAWSFYNYDD SITE PONDS COMPLEX, DISPOSAL OF OTHER MINOR STRUCTURES AND RELATED CAPPING AND DRAINAGE WORKS - RESPONSE TO THE SNPA SCOPING OPINION

Thank you for your revised scoping opinion dated 23rd March 2023. This letter provides Magnox's response to the points raised, concentrating on explaining on how and where the requested information will be provided with the planning application documentation. This letter also explains that some aspects of the scoping opinion appear to relate to works that are not proposed as part of this development, and where this is the case then it is not appropriate to address them in the application documentation or in the Environmental Statement.

Some of the points raised relate to the cumulative impacts of the proposals with future developments at the site not yet proposed, and which will be assessed under planning and environmental permitting as and when those proposals come forward for permissioning. Therefore, in accordance with Schedule 4 of The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 and standard Environmental Impact Assessment (EIA) practice, the ponds complex Environmental Statement will only assess the impacts of the development in combination with any relevant concurrent or approved future developments.

The new Trawsfynydd reactor decommissioning strategy of "early" reactor dismantling requires consent under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended). For this reason, all future development and decommissioning of the site is expected to be described and assessed in a further Environmental Statement required to obtain decommissioning consent from the Office for Nuclear Regulation.

Finally, Magnox is aware that potentially significant changes to environmental impact assessment regulations are being consulted upon by the UK government. However, Magnox will continue to plan based on current legislation until it is clear if, when and how the regulations will change.

Should you have any queries about or disagree with any of our responses to the scoping opinion as set out in Annex 1 to this letter, then please do not hesitate to contact either myself or any of the Magnox personnel to whom this letter has been copied.

Yours sincerely,

Angharad Rayner
Site Director - Trawsfynydd Site

cc Mr Robin Wynne Williams – Senior Minerals and Waste Planning Officer on behalf of the North Wales Minerals and Waste Planning Service
robinwynnewilliams@gwynedd.llyw.cymru
Mr Tomos Hughes – NRW tomos.hughes@cyfoethnaturiolcymru.gov.uk
Mr Ian Warner – Magnox Limited
Dr Stephen Wilmott – Magnox Limited
Mr Michael Southall – Avison Young Michael.Southall@avisonyoung.com

Enclosures:

- Annex 1: Detailed Response to the SNPA Scoping Opinion of 23rd March 2023

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ANNEX 1: DETAILED RESPONSE TO THE SNPA SCOPING OPINION OF 23RD MARCH 2023

EXTRACT FROM SCOPING OPINION	RESPONSE
Environmental Impact Assessment Approach The MPA is generally supportive of the approach outlined in the Scoping Report. The ES should include a chapter setting out the overarching methodology for the assessment, which clearly distinguishes effects that are 'significant' from 'non-significant' effects. Any departure from that methodology should be described in individual aspect assessment chapters. Where professional judgement has been applied this should be clearly stated. The ES topic chapters should report on any data limitations, key assumptions and difficulties encountered in establishing the baseline environment and undertaking of environmental effects. The applicants should satisfy themselves that the ES includes all the information outlined in Schedule 4 of the 2017 Regulations. In addition, the Applicant should ensure that the Non-Technical Summary includes a summary of all the information included in Schedule 4. The applicant should consider a structure that allows the author of the ES and the MPA to readily satisfy themselves that the ES contains all the information specified under Regulation 17 and Schedule 4 of the 2017 Regulations (Information for inclusion in Environmental Statements). Cross refer to the requirements in the relevant sections of the ES, and include a summary after the Contents page that lays out all the requirements from the Regulations and what sections of the ES they are fulfilled by.	Noted.
Proposed Development The Environmental Statement should include a description of the development, the site, in terms of location, physical features, land use and should identify sensitive receptors within the locality. It should also include a description of surroundings and proposed development together with likely hours of operation / construction phase of the development, consideration will need to be given to	A comprehensive project description will be included within the Environmental Statement, though it may include alternative demolition methods or plans (all to be assessed) where it is not possible at the present time to be definitive.

EXTRACT FROM SCOPING OPINION	RESPONSE
the disposal/treatment/recovery/reuse of radioactive wastes and other waste streams which will be produced as referenced within the report. Consideration should be taken of the proposed decommissioning and site restoration collectively approved under planning permission and how / if this differs to the original concept but complements the long term decommissioning / restoration aims. This should be a methodology as to how the site is to be maintained throughout the decommissioning process and how upkeep will not result in the site becoming derelict over time.	Amongst other things, the Alternatives chapter within the Environmental Statement will compare the current proposals for the ponds complex and associated features with past proposals, specifically the original plan to remove all radioactivity from the ponds complex and remove other minor features, such that conventional demolition and infill could be adopted, with no on-site disposal of radioactive wastes. As a heavily regulated nuclear site owned by the NDA (in effect government), the site will be regulated and appropriately managed until such time as the requirements for release from the nuclear site licence and environmental permit are met.
Biodiversity <u>Protected Sites</u> As noted within the Scoping report (Baseline conditions 5.3), there are various protected sites within various distances to site. Table 5.7 - Potential biodiversity effects requiring assessment, indicates which sites are to be screened in/out. While the Authority broadly agree with the assessment presented, running water has been screened in due to the potential for contamination of off-site watercourses. As such, it should be noted that hydrologically linked protected sites, and those with water dependent mobile features may be impacted by the proposals (depending on the detailed assessment of ground and surface water), as part of any planning application submitted, avoidance and mitigation measures may be required to safeguard protected sites. The Local Authority will need to carry out a test of likely significant effects under regulation 61 of the Conservation of Habitats and Species Regulations 2010 (as amended). This will be done in consultation with NRW. If the assessment concludes there is likely to be a significant effect upon the conservation status of these sites, the Local Authority will need to carry out an Appropriate Assessment under the Regulations.	The Planning Application will be accompanied by a shadow Habitats Regulations Assessment that will address the potential for contamination of water courses and in particular where this could impact upon designated sites. The long-term impacts chapter that will summarise the assessments of pollution of ground and surface waters, produced for the environmental permit application, will also address these issues. A permit would not be granted by NRW for the disposals unless they were satisfied that there were no significant adverse effects on surface waters or ecology, including designated sites. The Environmental Statement will provide outline information on lighting, as will a Construction and Environmental Management Plan that will be submitted with the application. However, we suggest that a pre-commencement condition concerning submission and approval of more detailed lighting plans (for the works and post-works phases) is

EXTRACT FROM SCOPING OPINION	RESPONSE
Protected Species It is noted; the assessment presented in Section 5 'Biodiversity' with regards to bats, great crested newts, otters, water voles, red squirrels, pine martens, dormice and Invasive Non-Native Species. The majority of these species have been scoped out because they were not identified on site. Considering the location of the proposed work within an area of hard standing and the nature of the work, we consider these proposals to have low likelihood of direct impact on protected species. As noted in the Protected Sites section, contamination of watercourses may impact on protected species in the vicinity, and this should be considered in future assessments. As bats have been scoped in, there will be a requirement to produce further information about how the delivery of these proposals will avoid any negative impacts on this species. As this work is not located directly where the bats are roosting, we would expect the main focus to be on commuting and foraging individuals. Any assessment should include the prevention of additional, inappropriate lighting of adjacent habitats and also the reduction of existing lighting where possible. Any lighting mitigation for bats will likely benefit other species, but attracting further species into the site would not be desirable	imposed by SNPA, should SNPA be minded to grant planning permission.
Geo-environmental Impacts and Surface Water Quality The Authority disagrees with elements of the Scoping Report relating to this section. In particular the scoping out of certain receptors, particularly with the hydrogeological elements references in Table 6.6 and Table 6.8. We do not agree with the scoping out of the effects from impacts on groundwater behaviours. We advise that it is too early a stage to scope out such an important element. The breakage of hardstanding and excavation works (around pipes for example) may result in greater infiltration and could mobilise contaminants. Notwithstanding, I am aware that NRW as consultee within the Planning process and regulator of the site's Environmental Permit have had several discussions with Magnox around this topic and the importance of groundwater monitoring. Further documents have been provided as part of the Scoping submission	Magnox and its consultants have given proper consideration to potential impacts on groundwater behaviours, and concluded that the only aspects of the proposed development that have any potential to affect groundwater behaviours are: 1. Temporary removal of hard cover (if proposed) allowing for direct rainwater infiltration to the ground; and 2. Grouting or removal of under-ponds drains (if proposed). The effect of these on groundwater will be discussed in the Environmental Statement (the former in the geo-environmental impacts chapter, and the latter in the long-term impacts chapter). The main effect of temporary removal of hard cover (if proposed) is expected to be increased mobilisation of existing ground contamination

EXTRACT FROM SCOPING OPINION	RESPONSE
including documents *DD-MISC-0732 Slide-pack on characterisation and monitoring Birmingham 17-11-22* and *198-SNPA-AR-05670_Request for Scoping Opinion – Further Information_02.02.23*; and there is now recognition of the importance of groundwater monitoring, both during and post-implementation within the scoping process. This is a key requirement due to the degree of uncertainty at the site in the short, medium and long term and the long duration over which activities will be occurring at the wider site. As it is understood there will be many activities occurring at the site which may influence groundwater conditions and that phasing of different works may be subject to change. Therefore, the ES should include an in-combination assessment of engineering works which may interact with groundwater on the site. It is important to recognise the need to develop meaningful monitoring strategies in support of the application and ES that will be scrutinised and set to operate over many decades to minimise uncertainties as the project progresses. We would welcome the development of a strategized and adaptive monitoring regime and a Water Management Plan (WMP). A WMP would for example identify trigger values and reasonable next steps if particular trigger values were to be exceeded for 3 consecutive quarters etc. The role of other activities, such as SuDS, and the impacts that these might have on groundwater are not integrated within the scoping assessment (3.5.8). It's our understanding that the ambition for the site is to discontinue pumped discharge to the lake and to use passive SuDS as a means of managing surface storm water and groundwater at the site. Potential effects from these proposals (whether that's relating to changes to the groundwater flow regime or groundwater quality) should be included within the ES.	if the hard cover removed overlies such an area of contamination; as stated in the scoping report it was already proposed to assess this within the Environmental Statement. No ground dewatering is required or proposed, so there will not be any effects of ground dewatering on groundwater behaviours. Should this change and become part of the proposals during the works phase, then the issue will be assessed. The Environmental Statement will summarise the possible effects of future engineering works at the site on groundwater flows – there is an ongoing technical assessment of this to support the permit application. However, as noted below under cumulative effects, in accordance with standard EIA practice, it is not for Environmental Statements to assess future developments not yet designed, applied for or consented, but rather it is for future developments to be accompanied by assessments of their impacts on already consented development, as appropriate. There are not expected to be any significant concurrent engineering works at Trawsfynydd that overlap with the ponds demolition. The Environmental Statement will assess the cumulative impact of the proposed development with other concurrent or approved developments the impacts of which may compound with the impacts of the ponds complex proposals. However, the cumulative impact of the proposals combined with future developments not yet proposed, applied for or consented such as ceasing pumped discharge to the

EXTRACT FROM SCOPING OPINION	RESPONSE
	lake and replacing that system with a passive Sustainable Drainage System (SuDS) will not, in general, be addressed[1]. Termination of the diversion culvert pumping and replacement of the site drainage system with a passive system (likely to be in several decades time) will require planning permission and an environmental permit change, and the impacts will be assessed in support of those applications at the time, taking account of previously consented developments at the site. Water Monitoring Plans with trigger levels are being produced separately for the works phase and the post-works phase, and these will be summarised in the Environmental Statement in the relevant chapters. The post-works phase Water Monitoring Plan is adaptive and will explain how the monitoring would be altered in response to either unexpected results or other engineering developments at the site. Note that Magnox will avoid the use of acronyms as far as possible since, for example, WMP can mean Water Management Plan, can mean Water Monitoring Plan, and can mean Waste Management Plan, these being very different documents in purpose[2].
Flood Risk and Drainage With regards to flood risk, the LPA are satisfied with the content of Section 7 (Flood Risk and Drainage). It is agreed that the application site (red line boundary) is not within an area shown to be at risk of flooding from rivers or sea	Noted. The proposed drainage is functionally the same as the current drainage, meaning that the rainfall capture area is the same and the

[1] Where the Environmental Statement summarises the long-term effects of the disposals on ground and surface waters, since the assessments have (as required under environmental permitting) considered the impacts hundreds and thousands of years into the future, account is taken of the Trawsfynydd final end state and altered drainage where appropriate in those assessments.

[2] Similarly, the acronym HRA sometimes means Habitats Regulations Assessment and sometimes means Hydrogeological Risk Assessment, and the latter usage will be avoided in the Environmental Statement and planning application documentation.

EXTRACT FROM SCOPING OPINION	RESPONSE
according to the Flood Map for Planning (FMfP). The FMfP represents better and more up-to-date information on areas at flood risk (2004). NRW's remit, with regards to advising on flood risk and suitability of any assessment relates to flooding as shown on the FMfP/DAM and any associated main rivers or the sea. We note that the proposal is unlikely to have the potential to cause significant environmental effects in terms of flood risk. However, please be aware that the Flood and Water Management Act 2010 created Lead Local Flood Authorities (LLFA-Local authorities in Wales). This was to enable LLFAs to lead on managing local flood risks i.e. risks of flooding from surface water, ground water and ordinary (smaller) watercourses. As such we would advise that the LLFA - Gwynedd Council in this instance are consulted on this section (7) of the EIA process. Gwynedd Council also act as the Sustainable Drainage Approval Body (SAB), and it is noted in section 4 (Other Consents) that approval was obtained in May 2022. We therefore agree with the Summary (7.3.38 to 7.3.43) in that the key risk to the Proposed Development relates to surface water risk. As stated above, whilst we are satisfied with the content of section 7, we would advise that the LLFA should be the appropriate body to comment and advise on the management of flooding from this source. We note and accept the commentary made on the (unlikely) failure of the dams retaining Llyn Trawsfynydd. For completeness and future reference, we would advise that the table 7.3 footnote 10 that the Climate change guidance has been updated:- Climate change allowances and flood consequence assessments | GOV.WALES	routing of collected water is the same (to the lake via the diversion culvert). The proposed drainage strategy, which does not include removal of the diversion culvert and its replacement with a Sustainable Drainage System (SuDS), has been approved by the SuDS Approving Body (SAB). Drainage performance calculations are currently being undertaken which include modelling of drains performance in extreme rainfall events. The results of these calculations will be summarised in the Environmental Statement, and exceedance flow paths presented. For your information, depending on the demolition approach, it may be appropriate to screen out the impacts of water ingress into voids within the ponds complex. The identified update to climate change guidance is noted and the flood risk and drainage Environmental Statement chapter will utilise this or any future updates at the time of writing. How climate change could affect groundwater levels is also a consideration within the long-term impacts chapter.
Long Term Radiological and Non-Radiological Impacts The information within the scoping report relating to the radiological impacts (chapter 8) have been reviewed. Notwithstanding comments on Geo-environmental Impacts and Surface Water Quality (which also apply to radiological issues), the receptors identified appear to be appropriate and we concur with the need for the further assessments proposed. The approach to the long-term radiological assessments is in line with what NRW would expect to	Noted. This is the one topic where the effects of currently unapproved and somewhat distant future changes to the site, in particular when changes to the site drainage have been made and the current discharge arrangements have ceased, will be addressed. Specifically, this chapter will summarise the long-term impacts of the proposed

EXTRACT FROM SCOPING OPINION	RESPONSE
support the permit application under GRR (Guidance on Requirements for Release of Nuclear Sites from Radioactive Substances Regulation) and NRW have indicated that they are in technical discussions with Magnox on the validity of the models being used.	disposals via ground and surface water after the site has ceased to be a licensed and permitted site.
It is also noted that a Health Impact Assessment as advocated within TAN 21 to ensure that human health issues are not overlooked is to be undertaken. It is trusted that the Health Impact Assessment will feed in to chapters of the ES correctly in accordance with my comments noted within section 1 of this opinion Environmental Impact Assessment Approach and to comments relating to Duplication and Repetition below.	A Health Impact Assessment will be included in the Environmental Statement. It is currently planned that a workshop with local stakeholders will be conducted to provide input to this, and there will be a report documenting that event. This event report will be a separate document to the Environmental Statement but its key points will be included in the Environmental Statement.
Air Quality The Authority agrees with the contents of the Scoping report. However, dust control measures should form part of the planning application statements and reference will be included within the pre-app response. I also note that a Health Impact Assessment as advocated within TAN 21 to ensure that human health issues are not overlooked is to be undertaken, and reference to air quality will be included.	The project description in the Environmental Statement (and the Alternatives section) will address dust control. It will also be a topic covered within the Construction and Environmental Management Plan to be submitted with the planning application. The Health Impact Assessment will address dust and any concerns that the public may have about this issue. Finally, Magnox will develop (as it has for other projects) a dust monitoring scheme with associated stop work criteria.
Noise and Vibration The Authority is in broad agreement with the contents of the Scoping Report and discussions should be entered with Gwynedd Council Public Protection Service to determine the scope of the noise and vibration assessment in accordance with that of Construction Noise Assessment BS 5228 ABC Method.	Note that Magnox's EIA consultants now propose to scope out traffic noise from the assessment on the basis that traffic is scoped out of detailed assessment. This is a change from the submitted scoping report, and we would be grateful for your confirmation that this change is acceptable. Magnox and Magnox's EIA consultants would welcome the opportunity to engage with the Gwynedd Council Public Protection Service to discuss this and also the application of the ABC method.
Traffic and Transport Although we have not received a response from either Gwynedd Council Highway Department or Welsh Government as Trunk Road Authority, based on the information provided we believe that the contents of the Scoping report in relation to highway and transport issues to be satisfactory.	Noted. SNPA has, however, separately requested that a Highway Method Statement is submitted with the planning application and Magnox would be grateful if an example of such a document could be provided.
Historic Environment	Noted.

EXTRACT FROM SCOPING OPINION	RESPONSE
The Authority is in broad agreement with the contents of the Scoping Report.	
Landscape and Visual Impact Assessment The Authority is in broad agreement with the contents of the Scoping report in relation to the landscape and visual amenity effects. I do however draw your attention to the contents of NRW's response of the 21st October and the matters raised relating to the landscape baseline. To this effect it is suggested that landscape change, mitigation and possible enhancement may be introduced within a Landscape Appraisal document submitted in support of the application.	Landscape and visual impacts have, by agreement, been scoped out of the Environmental Statement. The topic will be returned to within the Planning Statement, which will reiterate information provided in the Magnox scoping report concerning viewpoints, betterment etc. There may be future developments at the Trawsfynydd site with far more significant landscape and visual impacts. This will be touched upon in the planning framework document to be jointly produced between Magnox and SNPA (albeit that that document is unlikely to be adopted before this planning application is made and determined). Note also that the new reactor decommissioning strategy requires consent under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations (EIADR). For this reason, the future development and decommissioning of the site will be described and assessed in a further Environmental Statement required to obtain EIADR consent from the Office for Nuclear Regulation; this will clearly contain an assessment of landscape and visual impacts of the future site development.
Socio Economic This is discussed within chapter 14 of the Scoping Report. The Authority is in broad agreement with the contents of the Scoping report, and accept that this can be scoped out. However, socio-economics or socio-cultural considerations and the Welsh language are material planning considerations and will need to be addressed within supporting documentation within the application's submission.	Magnox will produce a stand-alone Welsh Language Assessment document based upon the example previously supplied by SNPA, and this will accompany the planning application. Socio-economics / socio-cultural will be addressed in the Planning Statement that will also accompany the planning application (see below).
Key Planning Policy The ES should include an assessment of policy which includes consideration of waste and all other material planning considerations. In undertaking a comprehensive assessment informing of compliance with both National and Local policies, legislation and guidance documents this should avoid the need to	A Planning Statement will accompany the planning application. This will focus on the principle of the proposed development and provide summary discussion of issues raised in environmental policies. The Environmental Statement will address environmental policies, in the technical chapters and/or in a policy chapter. Magnox will seek to

EXTRACT FROM SCOPING OPINION	RESPONSE
resubmit the same information under the guise of a Waste Planning Assessment as required by TAN 21. Therefore the chapter should cover what is required as part of a Waste Planning Assessment in being appropriate and proportionate to the nature, size and scale of the development proposed and should provide all of the information necessary for the local planning authority to make a decision on the application. Proposals for developments falling under disposal and recovery operations should explain in the Waste Planning Assessment, set out in Annex B, where the proposal fits within the waste hierarchy and why it represents the best overall environmental outcome. Any environmental statement should take account of revisions and new guidance, policy or legislation which may be published.	avoid duplication between the Environmental Statement and the Planning Statement. Technical Advice Note (TAN) 21 states "*Where the application is accompanied by an Environmental Statement, the Waste Planning Assessment does not need to repeat information already provided in the Environmental Statement. However, the Waste Planning Assessment should provide the appropriate references indicating where the information can be found within the Environmental Statement*." Magnox proposes to include sign-posting text addressing the scope of Waste Planning Assessments (insofar as it is relevant to the present application) in both the Planning Statement and the Environmental Statement; we will aim to keep the text as focussed as possible, and the same in both places.
Cumulative Impact The consideration of cumulative impact is an integral part of the EIA process and section 3.5 of the Scoping Report describes both intra-project and inter-project effects. As noted within the Report, this proposal forms a greater goal for final end-state and existing consents will need to be factored for assessment.	The Environmental Statement will assess the cumulative impact of the proposed development with other concurrent or approved developments the impacts of which may compound with the impacts of the ponds complex proposals. However, the cumulative impact of the proposals combined with future developments not yet proposed, applied for or consented will not be addressed. The one exception to this is that where the Environmental Statement summarises the long-term effects of the disposals on ground and surface waters, since the assessments consider the impacts hundreds and thousands of years into the future, account is taken of the Trawsfynydd final end state and potential future land uses when estimated far future impacts, as appropriate.
Alternatives This is referred to within section 2.9 of the Scoping Report under the heading Proposed Development and is an important part of the EIA process. Regulation 17(d) which requires amongst other considerations; *"a description of the reasonable alternatives studied by the applicant or appellant, which are relevant*	It is currently proposed that alternatives to the Proposed Development are discussed in relation to the following topics: • the timing of demolition of the ponds complex; • on-site versus off-site disposal of radioactively contaminated concrete and masonry; • the detailed design of the proposals:

EXTRACT FROM SCOPING OPINION	RESPONSE
to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the significant effects of the development on the environment;". Alternatives should therefore be considered in relation to the Proposed Development with the requirements of Regulation 17 and Schedule 4 of the 2017 Regulations and any reasonable alternatives studied by the applicant should be presented in the ES. The reasons behind the selection of the chosen option should also be provided in the ES, including where environmental effects have informed choices made. It is worth bearing in mind that under the Conservation of Habitats and Species Regulations 2017 ("the Habitats Regulations") unless it can be clearly shown to the MPA that the project would have no adverse effect of the integrity of any designated sites, it would have to be shown that there is no feasible alternative solution. For consistency and to avoid confusion and repetition, it is urged that alternatives are discussed comprehensively within the ES with referencing as to relevance to the EIA process and to wider application requirements.	○ radioactive inventory management; ○ the creation (or not) of targeted monolithic infill; ○ sub-surface leachate pathway management; ○ under-ponds sampling drains management; ○ capping slab design; ○ drainage design; • demolition methods (e.g. enclosed, inside out, open air). The scope of this chapter may change in some respects as we approach application time, depending upon how the project develops, but the topics listed above are currently considered to be the key issues. A comparison of the environmental impacts of on-site disposal of the ponds complex radioactive wastes (concrete and masonry) with off-site disposal will be provided. Magnox is confident that there will be no adverse effect on the integrity of designated sites, and this will be demonstrated in the shadow Habitats Regulations Assessment as well as in the chapter on the long-term effects of the disposals on ground and surface waters.
Environmental Permit Noted within Section 4 – Other Consents of the Scoping Report and discussed wider within meetings with Magnox and NRW. It is anticipated that further discussions will ensue as to the timing of both planning and permitting applications and if both planning and environmental permit applications (GRR) are to be staggered or twin tracked. Based on discussions with NRW, the avoidance of unnecessary duplication of control is something the LPA and NRW strive to achieve. However, the EIA process will be subject to both regime applications. As the ES sets out the results of the EIA process; for consistency of decision, the avoidance of doubt and possible legal challenge, it is trusted that the planning application submission including the ES where there are both	The intention is that the planning application will follow a few months after the permit application, and that the information provided in the Environmental Statement that summarises permit application documents will be entirely consistent with those permit application documents. The main places this arises are: 1. In the Alternatives chapter; and 2. In the chapter concerning the long-term effects (which covers the long-term radiological and non-radiological effects of the disposals on ground and surface water, as well as safety in respect of future site occupancy and inadvertent intrusions by persons without any knowledge or protection).

EXTRACT FROM SCOPING OPINION	RESPONSE
permitting and planning considerations; that those chapters will be consistent in contents and format.	
Duplication and Repetition Generally, some applications that require the submission of Environmental Statements have contained superfluous information relating to issues that are irrelevant or of little importance to the proposed development. Competent Authorities, consultees and the public should not have to deal with large volumes of material and repetition which is irrelevant to the decision-making process. It appears that the proposed application will include statements, assessments and information that falls outside the EIA process, such documents will undoubtedly contain overlapping information. To avoid repetition, it is strongly suggested that certain statements and assessments that are required as part of the planning application are amalgamated within the contents of the Environmental Statement with clear referencing stating where to discover the necessary information and what information relates to the different elements of the application. In doing so, it is trusted that this is clearly stated within the contents of the ES.	Magnox will seek to avoid duplication of information and excessive text, and avoid the inclusion of superfluous information. We recognise that this is in everyone's interests.

Appendix 1D - Competent Experts and Competency Statement

As required under the Town and Country Planning (Environmental Impact Assessment) Regulations 2017[1], an Environmental Statement (ES) must be prepared by competent experts with the relevant expertise and qualifications.

The Applicant confirms that the competent experts engaged in the delivery of this ES are appropriate and Suitable Qualified Experienced Professionals (SQEP).

Competent experts involved in the preparation of this ES are listed in Table 1D-1.

Table 1D-1 List of competent experts

Topic	Responsibility	Name of company	Qualifications / Competencies of author
Project Director	Lead Verifier	WSP	BSc (Hons) in Environmental Sciences, MSc (with Distinction) in Environmental Assessment. Over 34 years in environmental consulting and Nuclear Sector EIA Lead from 2009. Full Member of Institute of Environmental Sciences (IES).
Project Manager	Secondary Verifier	WSP	MEarth(Sci) in Earth Sciences, PhD in Environmental Geochemistry and Geomicrobiology. Environmental Impact Assessment coordinator with seven years of experience.
Assistant Project Manager	Project Management Support	WSP	BSc in Geography, MSc in Environmental Impact Assessment and Management. Assistant environmental consultant with over two years of experience.
Introduction and Site and Surroundings	Primary Author	NRS	BSc in Environmental Earth Science. MSc in Urban Planning with specialism in EIA. Member of RTPI. Over 22 years experience delivering and assessing planning submissions and EIAs. Seven years experience

[1] UK Government (2017). The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017. [online] Available at: https://www.legislation.gov.uk/wsi/2017/567/contents [Accessed March 2024]

Topic	Responsibility	Name of company	Qualifications / Competencies of author
			working solely on nuclear and radiological matters.
The Project and its Alternatives and Regulatory	Primary Author	NRS	BA (Hons) in Mathematics, D.Phil in Mathematics. Over 36 years experience in nuclear industry and radiological matters working on land use planning, environmental permitting and radiological assessments.
Biodiversity	Primary Author	WSP	BSc in Biological Sciences, PhD in Environmental Biology. Over 20 years of experience in undertaking the ecological elements for a range of environmental projects.
Noise and Vibration	Primary Author	WSP	BSc (Hons) in Chemistry, MSc in Environmental Diagnostics. Acoustician with over 21 years of experience in undertaking noise and vibration assessments.
Geo-environmental Impacts and Surface Water Quality	Primary Author	WSP	BSc (Hons) in Plant Sciences, MSc in Environmental Rehabilitation. Over 30 years of experience in the assessment and management of soil and land contamination issues.
Geo-environmental Impacts and Surface Water Quality	Secondary Author	WSP	MEnvS in Environmental Studies. Experienced consultant with 19 years of experience specialising in land quality assessments for planning, EIA and environmental permitting.
Flood Risk	Primary Author	WSP	BSc (Hons) in Geography, PhD in Geography. Surface Water and Drainage Lead with 18 years of experience leading delivery of flood risk assessments and surface water environmental assessments.

Topic	Responsibility	Name of company	Qualifications / Competencies of author
Flood Risk	Secondary Author	WSP	MEng in Environmental Engineering, MSc in Environmental Technology, PhD in Hazardous substances transport and attenuation. Environmental engineer with 17 years of experience with a background in environmental permitting and assessments in the fields of water quality, groundwater and flood risk.
Long Term Radiological And Non-Radiological Impacts	Primary Author	NRS	BA (Hons) in Mathematics, D.Phil in Mathematics. Over 36 years experience in nuclear industry and radiological matters working on land use planning, environmental permitting and radiological assessments

Appendix 3A
Plant and Equipment List

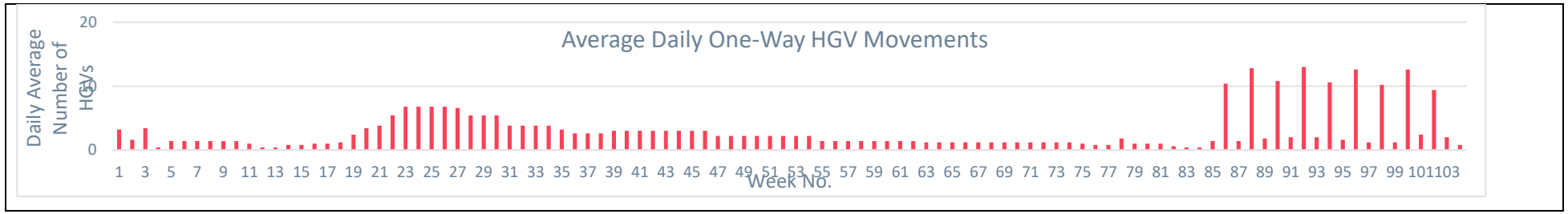
Detailed equipment requirements will be known after the selected contractor agrees the works method statement. Usual equipment used for this activity includes the following:

- 32t tipper trucks
- Articulated haulers (dump trucks)
- Bar bending machine
- Concrete batching plant
- Concrete delivery trucks
- Diesel generators & diesel air compressors
- Dust suppression equipment (misters)
- High-capacity mobile crushers units
- Lifting equipment including chain blocks, slings and shackles, four-wheel bogeys, skates
- M24 Lorry mounted Concrete Pump
- Mobile cranes
- Mobile settlement and dosing units
- Poker vibrator
- Power float
- Road cleaners
- Rubble conveyors
- Scissor lift
- Skid-steer loaders with sweeper and bucket attachments
- Stihl Saws
- Telehandlers
- Tracked/wheeled excavators with various attachments (breakers and buckets)
- Various hand tools including disc cutters, angle grinder, drills, breakers etc.
- Vibrating screed
- Vibrator rollers
- Water pumps
- Wheeled loaders/loading shovels
- Concrete saws (wire and track).

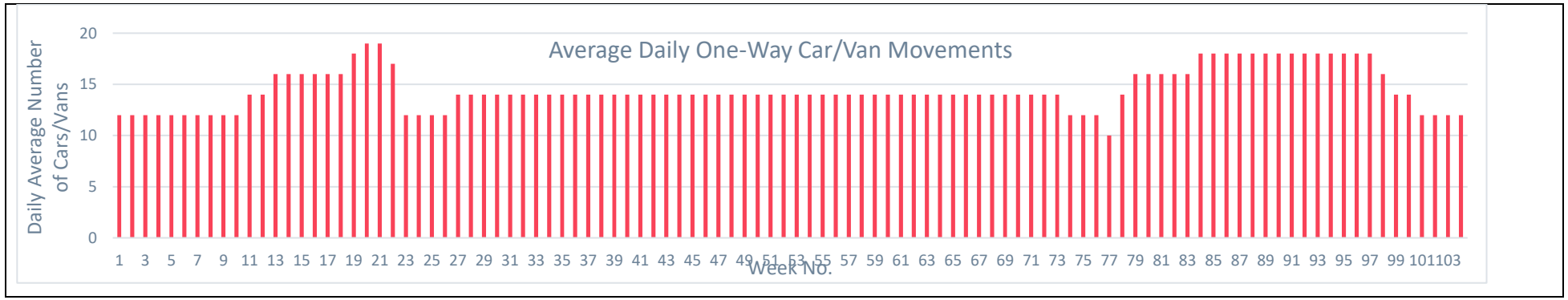
Appendix 3B
Projected Traffic Movements During the Works Phase

Daily Vehicle Movements

Graphic 3B.1 and **Graphic 3B.2** provide estimates of the daily vehicular movements associated with the Proposed Development.



Graphic 3B.1 Average Daily One-Way HGV Movements



Graphic 3B.2 Average Daily One-Way Car/Van Movements

Appendix 3C – Preliminary Post Works Phase Monitoring Plan

The currently envisaged scope of the monitoring is set out in **Table 3C.1** and the monitoring locations are shown on **Graphic 3C.1**. This Post Works Phase water environment monitoring plan has been produced to support the environmental permit application to allow the Proposed Disposals within the Disposal Area.

The long-term ground and surface water monitoring plan is subject to approval by NRW through the environmental permitting regime and may require revision (with NRW agreement) from that summarised below to take account of matters such as the continued collection of baseline water level and quality information. It is also expected to be adapted over time (again with NRW agreement) in response to the Post Works Phase monitoring results.

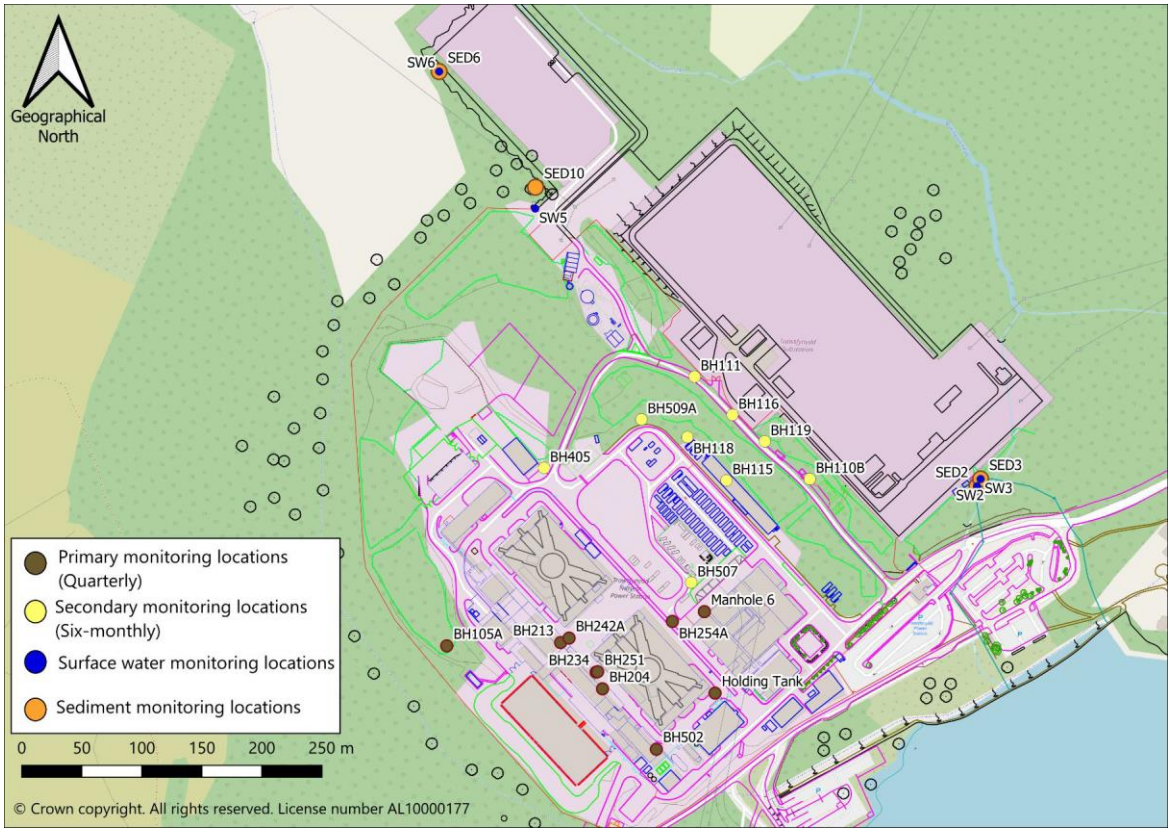
Data will be subject to expert review of concentrations of contaminants against baseline concentrations, including time-series trend analysis. Actions that may be taken in response to adverse results include:

- Should the pH of the water become unacceptably high, treatment of water at manhole 6 (an accessible location slightly east of the reactor buildings that “collects” groundwater);
- Concrete cap inspection and maintenance;
- Additional capping of the disposals, which could involve, for instance, construction of a composite linear low-density polyethylene (LLDPE)/mineral cap on the structural concrete cap;
- In situ chemical treatment of the demolition arisings; and
- In situ grouting of the material deposited in the voids.

Table 3C.1 Post-implementation Water Environment Monitoring Regime (Preliminary, Subject to Change)

Locations	Hydrometric Monitoring	Water Quality Sampling
Boreholes: BH213 and BH234	High frequency groundwater level monitoring.	Quarterly monitoring: • Field parameters: dissolved oxygen, temperature, redox conditions, • pH and electrical conductivity • Gross alpha/beta, gamma spectrometry • Metals (dissolved) • Major ions
Boreholes: BH105A, BH204, BH242A and BH254A	Quarterly monitoring of groundwater level.	

Locations	Hydrometric Monitoring	Water Quality Sampling
		• Bicarbonate and hydroxide alkalinity • Hydrocarbons
Boreholes: BH502 & BH251 **Holding tank for R1 water abstraction**	Quarterly monitoring of groundwater level.	Six-monthly monitoring: • Field parameters: dissolved oxygen, temperature, redox conditions, • pH and electrical conductivity • Gross alpha/beta, gamma spectrometry • Metals (dissolved) • Major ions • Bicarbonate and hydroxide alkalinity • Hydrocarbons • Volatile organic compounds including solvents
Manhole 6	High frequency flow rate monitoring for one year.	
Boreholes: **BH110B, BH111, BH115, BH116, BH118, BH119, BH405, BH507 and BH509A**	Six-monthly monitoring of groundwater level	Six monthly monitoring: • Field parameters: dissolved oxygen, temperature, redox conditions, • pH and electrical conductivity • Gross alpha/beta, gamma spectrometry • Metals (dissolved) • Major ions • Bicarbonate and hydroxide alkalinity • Hydrocarbons
Surface water monitoring locations: **SW2, SW3, SW5 and SW6**	None	Six-monthly monitoring: • Gross Alpha • Gross Beta • Gamma spectrometry
Sediment monitoring locations: SED2, SED3, SED6 and SED10	None	Annual monitoring: • Gross Alpha • Gross Beta • Gamma spectrometry



Graphic 3C.1 Post-implementation Monitoring Locations (Preliminary, Subject to Change)

Appendix 3D – Comparison of Radiological Endpoint Strategies

Summary of the Changes in Strategy in 2019

- **On-site Solid Radioactive Waste Disposals:**

As now, the pre-2019 plan was for all ponds complex buildings to be dismantled and demolished down to approximately ground level. The new proposal represents a change because the original plan was to decontaminate the sub-surface to be out-of-scope of radioactive substance regulation (essentially non-radioactive), and to infill the voids within those structures with out-of-scope materials, mainly demolition arisings.

- **Construction of a Cap and Associated Drainage:**

Construction of a robust concrete cap is now proposed so that the area of the ponds can be used as a working area to support other site decommissioning. Previously there was no requirement for a concrete cap: low nutrient grassland on locally sourced soil material (matching local soil character) was to be used to restore the ground surface after the removal of the buildings and surrounding hard standing.

Comparison of Environmental Impacts

In order to meet the original envisaged endpoint of a radiologically clean, demolished ponds complex, it is now believed that this would have to be delivered by the bulk removal option. Because of the scale of required excavations, it may be assumed that this bulk removal would take place close to, or after, completion of reactor dismantling. Therefore, most or all of the ponds complex buildings would be retained for some decades prior to that work, enclosed in a new overbuilding.

Radiologically, the new strategy will not result in significant harm, since if it was likely to result in significant harm then it would not be permitted by NRW. The Applicant is clearly cognisant of this, and of its legal and societal duties in this respect. Alkaline leachate will result from the interaction of infiltrating water with broken concrete used for infilling sub-surface voids. However, this impact arises from an aspect of the proposals which is not a change (demolition rubble was always proposed to be used as infill).

Various useful questions to compare the proposals with the earlier strategy for the ponds complex are set out in Table 3D.1 below.

Table 3D.1 Comparison of Environmental Impact of Alternative Strategies

Question	Comments
Does the new proposal involve different construction / demolition activities?	The Proposed Development involves the construction of a concrete cap. The pre-2019 strategy would likely now require the construction of an over-building to be retained until around the end of or after reactor dismantling. The former strategy would also involve

	significant ground excavations to enable the bulk removal of contaminated structures and ground.
Could the new proposal impact on biodiversity or protected species?	Such impacts are reduced by the Proposed Development, due to the works being much less significant as described in the row above.
Could the new proposal result in greater dust beyond the site boundary?	The potential for dust generation from demolition activities and from managing demolition material is largely unchanged given the use of water sprays and other control measures, noting also that it is not permissible to have uncontrolled dispersion of radioactivity from the site. The concrete cap will require concrete batching. The potential generation of dust from any concrete batching is small scale.
Would the new proposal increase traffic flows?	There is a positive benefit to traffic flows through the net reduction in the transport on public roads of waste and materials.
Could the new proposal result in greater noise or vibration levels beyond the site boundary?	There will be no significant adverse noise effects from the change to make on-site radioactive disposals. There will be possible noise effects from the construction of the capping layer and installation of drainage, and potentially noise from concrete batching. These effects are not expected to be at levels above the level they would be with the previous ponds complex strategy. The use of concrete crushers is similar, or potentially less, with the Proposed Development.
Would the new proposal change the visual aspect of the site from beyond the site boundary?	Given that reaching a radiologically “clean” endpoint would require most or all of the ponds complex buildings to be retained for some decades, probably enclosed in a new overbuilding, the change on this issue is positive. That said, the ponds complex is largely screened from off-site views by other site buildings, the surrounding terrain and trees.
Could the new proposal result in any adverse changes in groundwater flows?	With the previous strategy, before or during demolition the infilled ponds complex voids would have had the walls breached so that they would not present a barrier to groundwater flow. However, the groundwater is for the most part at or below base slab level, and therefore the change not to breach the walls at such a low level is not likely to be significant or adverse.
Could the new proposal result in any adverse changes in surface water flows?	Prior to ponds complex removal in the excavation option, both options would involve the continuation of the current or equivalent drainage arrangements around the ponds complex. The final site drainage arrangements, which would not involve pumped discharge of surface water to the lake, may need slight modification to account for the concrete cap in the current proposals

	(which would reduce direct infiltration of rainwater to the ground after release of the site). This would require at most only small modifications to the final site drainage arrangements.
Could the new proposal result in any adverse changes to surface water quality during the works?	There may be some potential for rain to enter the voids during infilling and generate radioactively contaminated leachate which would be removed, treated as necessary and discharged from site in accordance with site discharge arrangements and limits. However, the demolition and infilling methodology will aim to minimise water ingress, e.g. by limiting the time in which open voids are exposed. The alternative works to reach a radiologically “clean” endpoint for the ponds complex would involve similar or potentially greater radioactive discharges. In terms of non-radiological aspects of the site discharges to surface waters, these are limited by discharge permit controls whatever strategy is adopted.
Does the new proposal increase greenhouse gas emissions?	There is expected to be a net decrease in transport emissions due to less transport of waste and materials being required. The indirect emissions associated with the additional cement use will increase. However, the volume required is limited and therefore unlikely to have significant adverse environmental impact.
Could the new proposal result in adverse socio-economic impacts?	Radioactive on-site disposals and leaving contaminated land in situ could in principle affect local communities through perception and possible blight. However, the magnitude of this is considered low because of the presence of a nuclear power station, Intermediate Level Waste (ILW) store and radioactivity in the lake (present due to historical authorised radioactive discharges).