

Calder Hall

Nuclear Power Station Environmental Management Plan

Issue 6 - June 2011



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Executive Summary

In August 2004, Sellafield Ltd applied to the Health and Safety Executive (HSE) for consent to decommission Calder Hall Nuclear Power Station in accordance with the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999. An Environmental Statement accompanied the application.

After a period of public consultation, the HSE duly granted consent in June 2005. Conditions were attached to the consent, primarily relating to the production and maintenance of an Environmental Management Plan covering the ongoing mitigation measures to prevent, reduce and if possible, offset any significant adverse environmental effects of the decommissioning work. The consent specifically requires the Environmental Management Plan to be re-issued annually or at intervals agreed with the HSE. This document is the sixth issue of the Calder Hall Environmental Management Plan and covers financial year 2010/11, the first issue having been issued in September 2005. New information in Issue 6 covers the decommissioning undertaken to date and describes the effectiveness of the environmental mitigation measures for this work.

As Head of Programme Delivery for Calder Hall, I give my continuing commitment to reducing to a minimum any adverse effect on the environment as a consequence of our decommissioning operations.



M D Brownridge

Head of Programme Delivery, Calder
June 2011

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1. Introduction

Calder Hall Nuclear Power Station (hereafter Calder Hall) ceased generating electricity in March 2003 after 46 years of operation. In accordance with Government Policy, work has now begun to systematically remove (or decommission) the plant and buildings associated with electricity generation at the site. Prior to commencing this work Sellafield Ltd, the Licensee of the site ¹, were legally required to seek consent from the Health and Safety Executive (HSE) for consent to carry out the decommissioning project ².

Application was made to the HSE for consent to carry out the decommissioning project at Calder Hall in August 2004. In support of this application an Environmental Statement ³ was provided, which assessed the impacts of the project on the environment. Following an extensive public consultation the HSE granted consent to carry out the decommissioning project at Calder Hall in June 2005, subject to certain conditions (listed in full in Appendix 2). Condition 2 requires the licensee to prepare an Environmental Management Plan (EMP) which shall:

- list the mitigation measures that are already identified in the Environmental Statement and evidence submitted [to the HSE] to verify information in the Environmental Statement;
- list the options to implement work activities where mitigation measures may be required but where selection of an option will only be possible in the future; and
- list the work activities where mitigation may be required but where assessments to identify mitigation measures will only be possible in the future.

It is a requirement of the conditions attached to the Consent to describe the effectiveness of the mitigation measures over time. This EMP is therefore a living document that will be periodically reviewed and revised throughout the decommissioning project. The EMP will be reissued annually or at other intervals agreed with the HSE. Future submissions will include a summary of environmental performance over the previous 12 months and a report on the results will be submitted to the HSE at the Calder Hall NII ⁴ Annual Performance Review Meeting.

Further information on the HSE's decision to grant consent to decommission Calder Hall can be found in their decision report, which describes the content of the conditions attached to the Consent and the main reasons and considerations for the decision. Copies of the document are available from:

**Health and Safety Executive
Nuclear Safety Directorate Information Centre
Redgrave Court
Merton Road
BOOTLE
Merseyside
L20 7HS**

Or via the internet from: <http://www.hse.gov.uk/nuclear/nuc23.pdf>

1. Prior to the transfer of certain civil nuclear liabilities to the Nuclear Decommissioning Authority (1st April 2005) Calder Hall was Licensed to British Nuclear Fuels (BNFL) plc hence it was BNFL plc who originally applied for consent to decommission Calder Hall from the HSE. This change does not constitute a change to the Licensee as defined by the Nuclear Installations Act 1965 (as amended).
2. European Council Directive 85/337/EEC, as amended by Council Directive 97/11/EC, sets out a framework for the assessment of the effects of certain public and private projects on the environment. The Directive is implemented in Great Britain for decommissioning nuclear reactor projects by the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999
3. Sellafield Ltd (2004) Calder Hall Nuclear Power Station Environmental Statement (in support of the application to decommission Calder Hall Nuclear Power Station as required by Statutory Instrument 1999 No. 2892: Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999)
4. Her Majesty's Nuclear Installations Inspectorate. A part of the Nuclear Directorate of the HSE, senior officers of which have delegated regulation and

[enforcement powers relating to nuclear licensing under the Nuclear Installations Act 1965.](#)

Any queries relating to decommissioning activities at Calder Hall or requests for copies of this EMP should be addressed to:

**The Head of Programme Delivery,
Calder Hall,
Sellafield Site,
Seascale
Cumbria
CA20 1PG**

In addition to the submission of this EMP to the HSE, Sellafield Ltd will also provide copies to the:

- West Cumbria Sites Stakeholder Group (where it can be viewed on their website www.wcssg.co.uk)
- The NDA

2. Scope Of The Environmental Management Plan

This EMP details the mitigation measures to prevent, reduce and where possible offset any significant adverse effects on the environment throughout the decommissioning of Calder Hall. The decommissioning project at Calder Hall is divided into four phases as follows:

- defuelling and preparations;
- interim decommissioning;
- care and maintenance; and
- final site clearance

These phases are explained in Box 1.

This EMP is divided into three parts with the first part encompassing the defuelling and preparations and the interim decommissioning phases as they run in parallel to a large extent. This is predominantly because mitigation measures may change in the future in light of experience and developing technologies. Where mitigation measures are still to be identified or require changes, these will be described in subsequent issues of the EMP, together with the reasons for the change. Environmental impacts were grouped in topic areas in the Environmental Statement as are the mitigation measures described in this EMP (see Box 2).

Box 1 - Summary of the Main Decommissioning Phases

Defuelling and preparations is the first phase during which the reactors will be defuelled and the fuel elements will be sent to the Fuel Handling Plant for reprocessing. This phase also covers maintenance activities associated with both the defuelling process and the ongoing Calder Hall Site management. The second stage is interim decommissioning when the following activities will take place:

- Conversion of all Calder reactor buildings into Safestores in preparation for the Care & Maintenance (C&M) phase.
- Hazard reduction activities continue with asbestos removal from the heat exchangers and from within the turbine halls. (Assessment of the best option for safe disposal of the asbestos waste is included).
- Removal of redundant facilities including cooling systems, utilities, Turbine Hall B, generators and substations, administration and ancillary buildings.
- All plant, not required for Industrial Heritage purposes or the long term quiescent C&M period, removed.
- All Calder Reactor heat exchangers dismantled and removed.

Care and Maintenance is the third phase which could potentially last for some decades, during which no significant dismantling will be carried out. The site will continue to be managed, monitored and maintained.

Final Site Clearance is the last phase and is expected to take about 10 years. This involves the dismantling of the remaining structures on the site, including the reactors and the clearance of any residual radioactivity to the applicable standards.

Box 2 - Environmental Assessment Topics

- Air Quality and Climatic Factors; • Archaeology and Cultural Heritage; • Ecology; • Geology, Hydrogeology and Soils; • Noise and Vibration; • Landscape and Visual; • Socio-Economic; • Surface Water Quality and Drainage; and • Traffic and Transport.

In addition to the mitigation measures, a brief description of the Calder Hall site and its surroundings is presented in this EMP together with an overview of the types of operations that will be carried out during care and maintenance preparations. Further details for all phases of the decommissioning project at Calder Hall are presented in the Environmental Statement. The Transport Management Plan can be found in Appendix 1.

3. Stakeholder Engagement

Whilst decommissioning represents a fundamental change in operations at Calder Hall, Sellafield Ltd remains committed to engaging with stakeholders at all phases in the decommissioning process. Regular meetings have been held with the West Cumbria Sites Stakeholder Group (WCSSG). In addition a number of other organisations (see Box 3) are kept informed of activities at the site. The organisations listed in Box 3 were also involved in the public consultation process for the Environmental Statement.

Box 3 - Local Stakeholders

- Allerdale District Council; • Beckermet Parish Council; • Copeland Borough Council; • Cumbria County Council; • Drigg and Carleton Parish Council; • Gosforth Parish Council; • Ponsonby Parish Council; • Seascale Parish Council; and • St Bridget's Parish Council.

As well as regular meetings with stakeholders, where appropriate, other interested parties will also be kept informed of specific decommissioning activities. Some examples are shown in Box 4.

Box 4 - Examples of Additional Stakeholder Activities

Informing the Highways Agency and Local Highways Authority when large cranes etc. are to be delivered; and
Informing local residents of when any short-term activities that may cause a noise nuisance will take place.

The Role of the Nuclear Decommissioning Authority (NDA)

The Energy Act (2004) requires that the NDA must prepare a strategy for carrying out its functions and from time to time to revise that strategy. This strategy must set out the steps that the NDA proposes to take for:

- **giving appropriate publicity to its responsibilities and strategy;**
- **explaining them both to persons having a particular interest in matters relating to the carrying out by the NDA of its functions and to the general public;**
- **ensuring that the NDA is kept informed at all times of the opinions about such matters of persons having such a particular interest; and**
- **facilitating the communication by such persons of their opinions to the NDA.**

The NDA is also required to give encouragement and other support to activities that benefit the social or economic life of communities living near those sites for which it has responsibilities, including Sellafield.

The NDA have given their commitment to openness and transparency and to the continued development of a proper and effective stakeholder engagement framework.

4. The Site and Surrounding Area

Location

Calder Hall lies within the Sellafield Nuclear Licensed Site (SNLS), a large industrial site located near the Cumbrian coast approximately 2 kilometres (km) north-west of the village of Seascale, 16 km south of the town of Whitehaven and 40 km north of the port of Barrow-in-Furness. The site is just under 1 km from the Irish Sea coast, adjacent to the River Calder, at an altitude of approximately 20-30 metres (m) above Ordnance Datum. The SNLS comprises approximately 300 hectares (ha), of which Calder Hall represents approximately 27 ha.

Description

Calder Hall was built and commissioned between 1953 and 1959 finally ceasing generation at the end of March 2003. The station comprised four gas cooled Magnox type reactors each consisting of a graphite core enclosed in a cylindrical steel pressure vessel surrounded by a concrete biological shield. When operating the reactors were cooled using carbon dioxide. Each reactor had four heat exchangers (or boilers), located outside the biological shield, which supplied steam to drive the turbines. There were two turbine halls, each containing four 30 MW capacity steam turbine generating units, which were cooled by four cooling towers. In addition, there were a number of ancillary buildings on the site that were required to support the station during operations such as administration and welfare buildings, a chemistry laboratory, workshops and stores.

A number of facilities common to other Magnox Power Stations were not required at Calder Hall due to the availability of alternative facilities on the main Sellafield site. First, there are no fuel cooling ponds since spent nuclear fuel is transferred directly to the Magnox reprocessing plant located on the main Sellafield site. Second, liquid radioactive effluent is transferred using a bowser to the Sellafield Effluent Treatment Plant for processing and there is, therefore, no active effluent treatment plant at Calder Hall. Finally, operational intermediate level radioactive waste ⁵ (ILW) is transferred to the Sellafield Miscellaneous Beta Gamma Waste Store and there are, therefore, no ILW vaults on the site with the exception of a small spent control rod ⁶ storage facility.

Following the reactors being finally shutdown in 2003, a programme of hazard reduction has been instituted. This included the removal from site of oils and chemicals no longer required, such as carbon dioxide, lubricating oils etc.

⁵ ILW – Forms a small part of the total radioactive waste and consists mainly of small reactor components such as thermocouple wires.

⁶ Control rods are metal components used in operating reactors to control the heat-generating reaction taking place in the core. Control rods become radioactive by means of activation and when no longer required become a radioactive waste.

Local Watercourses

The River Calder runs between Calder Hall and the main Sellafield site and was partly canalised during the development of the SNLS. It has a catchment area of approximately 45 km² comprising predominately agricultural land or upland moorland and runs for approximately 12 km from its headwaters to the coast.

Other watercourses near the site include the River Ehen and Newmill Beck. The River Ehen drains the catchment north of the River Calder, joining the River Calder at the coast. Newmill Beck drains a small catchment to the south of Calder Hall and flows into the River Calder downstream of the site, just upstream of the River Calder's confluence with the River Ehen.

Geology and Hydrogeology

The Calder Hall site comprises a variety of superficial Recent and Pleistocene (glacial) deposits up to 40 m thick that completely covered rockhead before its construction. The construction of Calder Hall and

the canalisation of the River Calder have modified the superficial geology. The underlying bedrock is the Permo-Triassic St Bees Sandstone, which is a thick (600 m or more) relatively uniform, fine-grained sandstone. At Calder Hall the sandstone dips gently south-westwards at 5-12 degrees.

The superficial deposits are not identified as aquifers, but where sandy/gravel deposits occur, these may hold quantities of groundwater and could be considered Minor Aquifers. The St Bees sandstone is a Major Aquifer, which is extensively exploited by Sellafield Ltd in and around Sellafield for provision of supplementary industrial water supplies.

Sensitivity of the Receiving Environment

The nearest settlements are the villages of Calder Bridge, approximately 2 km to the north and Seascale, approximately 2 km to the south-east. There are no residential or other sensitive properties within 500 m of the Power Station.

Two Landscapes of County Importance lie along the coast to the north-west and north of Calder Bridge, the Heritage Coast approximately 10 km to the north west at St Bees Head, and the Lake District National Park, the boundary of which lies approximately 2 km to the east of the site. In addition, the Low Church Moss Site of Special Scientific Interest is noted for supporting a variety of wetland habitats. Cumbria Wildlife Trust has notified eight non-statutory Sites of Wildlife Importance within 2 km of Calder Hall comprising:

**Seascale Dunes and Foreshore;
Starling Castle;
Sellafield Tarn;
Gaitskill Wood;
Brownbank Moss;
Ponsonby Tarn;
Calder Bridge Wood; and
Terrace Bank Wood.**

Parts of the River Ehen are a Special Area of Conservation (SAC), primarily by supporting the largest population of freshwater pearl mussel (*Margaritifera margaritifera*) in England. Though the presence of freshwater pearl mussel is the primary reason for site selection, the River Ehen also qualifies as a SAC by supporting Atlantic Salmon (*Salmo salar*).

5. Site Management

General Site Management

Hours of Work

Most work on site will be undertaken under a five days per week, single shift working arrangement. Shift Surveillance Teams work continuous shifts, 7 days a week and some contract work will involve extended day hours and/or weekend work. It is currently not anticipated that any night time working will be required, although from time to time it may be necessary in the interests of safety or to accommodate certain activities which need to be undertaken within a short time period. Noisy operations will generally be undertaken during the hours 08:00 to 17:00.

Lighting

The existing night-time illumination of the Power Station will cease during care and maintenance preparations. Whilst there may be some need for flood lighting, where possible, it will be localised to a building or piece of plant.

Transport

Vehicle movements to and from Calder Hall will be subject to the provisions of the Transport Management Plan (see Appendix 1). In summary:

- Staff and contractors primarily drive to the Calder Hall site by car, although contractors use a minibus from an off-site car park;
- Traffic onto site has reduced since the introduction of restrictions on single occupancy of vehicles; Low level radioactive waste ⁷ (LLW) will be transported to the national LLW repository at Drigg, Cumbria by rail via the internal railhead as happens at present;
- Any non-radioactive waste requiring removal from the site will be appropriately packaged for transport off-site by HGV's. A mixture of HGV's and smaller vehicles will make deliveries;
- A construction fence has been erected around the Calder Hall site to prevent vehicles from traversing the site unnecessarily;
- Subsidised cycle purchase schemes have been organised to encourage the workforce to cycle to work instead of using cars.

Decommissioning Methods

Conventional Area Decommissioning

Conventional plant and buildings will be de-planted and demolished using standard construction industry methods. The exact methods to be employed will be detailed in method statements for individual projects. All buildings and structures will be demolished to ground level. Any voids will be filled using rubble from the demolition of the buildings. Any remaining structures will be punctured to assist drainage.

Heavy plant will be split into components or sub-component parts prior to removal by crane. Mechanical and flame cutting will be used to prepare the plant for lifting. Buildings will be demolished using a variety of methods including JCB type vehicles, excavators with metal shears and concrete crushing attachments. Some work will also be carried out by hand.

⁷ Low level radioactive waste forms around 90% of radioactive waste comprises routine items such as nuclear workers' gloves and overalls paper towels and certain plant equipment.

Reactor Controlled Area Decommissioning

Radioactive plant in the reactor buildings will be decontaminated, where practicable, and dismantled. If practicable, plant and equipment will be decontaminated in situ and recycled. Examples of these decontamination processes are shown in Box 5. Contamination control provisions will be applied (eg work will be done within temporary enclosures) and working procedures will take account of the requirement to minimise exposure to radiation to as low as reasonably practicable (ALARP). Following decontamination and de-planting, buildings scheduled for demolition during care and maintenance preparations will be demolished, using conventional techniques. Monitoring checks will be made as demolition proceeds, and on the resulting demolished materials prior to disposal.

Box 5 - Examples of Decontamination Techniques

- Chemical decontamination involves the use of chemicals to remove the surface contamination
- Scabbling involves the physical removal of surface contamination, predominantly on concrete
- Shot blasting uses high velocity shot to remove surface contamination
- Water jetting involves the use of a pressurised water jet to remove surface contamination
- Wipe down where decontamination is removed by 'wiping'; specialist equipment and materials are usually required
- Sponge Jet equipment used by waste team which involves abrading the surface of contaminated metal with a stream of sponge beads which remove and absorb surface contamination.
- Decontamination using steam cleaning

Waste Management

Intermediate Level Radioactive Waste (ILW)

The quantities of ILW arising during care and maintenance preparations are expected to be very small and any arisings will be transferred to the Sellafield Miscellaneous Beta Gamma Waste Store. Neither an ILW store nor any temporary ILW packaging facilities will be required at Calder Hall.

Low Level Radioactive Waste (LLW).

Solid LLW will be managed in accordance with the National LLW Strategy and will be consigned to the preferred waste route in line with BAT and the Waste Management Hierarchy. Appropriate treatment / disposal options will be engaged in the supply chain, via LLWR segregated services contract or directly, as appropriate.

Any radioactively contaminated oils will be managed using established processes located on the main Sellafield site, for which the appropriate authorisations are in place. Other radioactive liquid effluent requiring disposal will be periodically transferred by bowser to the Sellafield Effluent Treatment Plant for processing and disposal. This latter process was used while Calder Hall was generating electricity.

Non-radioactive Hazardous Wastes

Solid hazardous wastes will be managed by authorised contractors who hold the appropriate Carrier's Licence, which will be checked for current validity before a contract is placed and implemented. The specific contractor used will depend on the type of waste requiring disposal. All records are auditable and will be checked annually.

Non-radioactive oils will be sent to an approved contractor and recycled. Oil soaked rags and pads, which are stored in drums, have had any free oil separated from them. This oil has a low level of radioactivity and has been stored, together with other contaminated oil, in a tank on the Calder Hall Site.

Asbestos

All bulk asbestos removal has been completed. Any residual asbestos will be removed under stringent safety conditions.

Other Wastes

Non-radioactive waste materials have arisen throughout the operating life of Calder Hall. In general, the management of waste at Calder Hall will aim to minimise the need to use landfill by reducing waste volumes wherever possible by following the hierarchy of waste management, ie reduce, reuse, recycle. Calder Hall follows the Environmental Protection Act 1990 Duty of Care principles for all waste arisings and where waste is transferred, it is accompanied by a transfer note and a full written description of the wastes.

Inert demolition material has been used to fill the cooling tower basins and other voids resulting from the demolition of the towers and other structures. It is not anticipated that any significant quantities of demolition material will need to be transported off-site for landfill.

Scrap metal (eg steel and copper from wiring) and glass will be sent to an appropriate contractor for recycling. If it is not practicable to reuse or recycle any scrap materials they will be disposed of via approved routes in accordance with the Duty of Care principles, principally landfill.

Non-radioactive effluent will be disposed of via authorised routes to the existing interceptor sewer. There are no expected changes to the effluents leaving the site that would require variation under the Water Resources Act 1991. If there are changes to effluents leaving the site then a variation will be sought.

Radioactive Discharges and Emissions during Care and Maintenance Preparations

Radioactive discharges to air and water from Calder Hall during decommissioning will continue to be made in accordance with authorisations granted by the Environment Agency under the provisions of Radioactive Substances Act 1993. It is expected that annual gaseous and liquid discharges will reduce, although there may be some peaks resulting from certain activities.

6. Works Completed and Works Planned for Financial

Years 2010/11 to 2012/13

The primary objectives of the decommissioning plan up to 2011/12 are, in order of priority, to:

- i) Manage the existing hazard on the Calder Hall site.
- ii) Manage the progressive reduction in hazard potential on the Calder Hall site.
- iii) Commence defuelling of the reactors in line with Magnox Operating Plan requirements
- iv) Progress items on the critical path to Care and Maintenance.
- v) Minimise ongoing maintenance costs by 'backing out' of plant and buildings by discontinuing usage and removing services.
- vi) Remove other plant and buildings as resources permit.

Works Completed and progress this year

Electrical Overlay

An Engineering Study concluded that the integrity of the Calder HV System could not be guaranteed to last through the Care and Maintenance period, and that an Overlay System should be installed to mitigate against this. The new overlay has been installed and the handover of supply progressing to the reactors and Calder Hall facilities. Once complete the 132KV and 11KV systems shall be isolated and made redundant.

Defuelling

Plant modifications have been completed and Calder Hall is in a position to commence active commissioning of the defuelling route and commence the defuelling operation. The defuelling rate is governed by the Magnox Operating Plan.

Heat Exchanger Remediation

An asset care programme of work is ongoing to proactively manage the condition of the 16 Heat Exchangers. To date a detailed inspection programme has been introduced and a prioritised decommissioning programme implemented.

The decommissioning programme includes responding to emergent issues from the inspection programme and the proactive removal of all steelwork. It is planned to commence in 2011 to remove all steelwork from 2 heat exchangers as part of a pilot project to demonstrate size reduction, decontamination and recycling of materials.

Dismantling of the heat exchanger circuits will continue with the removal of the ducts which connect the heat exchangers to the reactors. To date the removal of redundant steelwork is progressing and all vent lines have been removed. 4 top ducts have been removed. Reactor 2 top duct 8 was successfully removed in March 2010 and reactor 2, top duct 6 and reactor 3, top duct 3 were removed in November 2010. All were placed on a concrete base and size reduced. An estimated 95% of the steel has been recycled with the remainder consigned to the Low Level Waste Repository.

Mobile Crane lifting elbow prior to duct removal





Asbestos waste removal

Bulk Lagging Removal

Heat Exchanger (Lagged)



Heat Exchanger (Stripped)



Turbine Hall Pipework (Lagged)



Turbine Hall Pipework (Stripped)



The final container of asbestos contaminated lagging material classified and stored as RSA Exempt material has been despatched and disposed of to landfill. This completes a 4 year project which collectively results in the despatch of 1757 Tonnes of Hazardous Asbestos Waste and 208 Tonnes of Calcium Silicate lagging material disposed of to landfill.

Steam Safety Valve Vent Lines

These vent lines have been removed as they were degrading into an unsafe state. All lines were monitored to confirm that they were uncontaminated and sent off site for scrap. There has been no change to the decommissioning plan regarding the vent lines however the timing of their removal was brought forward for safety reasons. There were 6 vent lines on each heat exchanger giving a total of 96 lines.

Works Planned to 2012-13

The works currently planned for the 2011/12 to 2012/13 financial years are summarised below. The actual work carried out will in practice be dependant on funding and prioritisation against other projects on the Sellafield Site. More detailed information is contained in the Calder Hall Lifetime Plan which is available from the NDA website, (www.nda.gov.uk).

- Electrical Overlay - Full installation and completion of the Electrical Overlay project.
- Heat Exchanger Decommissioning - continue to remove redundant steelwork in line with priorities set in the inspection programme. Commence a pilot full steelwork strip of 2 heat exchangers, thus removing all steelwork and platforms leaving behind the heat exchanger boiler. Progress steelwork removal of 5 top ducts to enable top ducts to be removed in 2012/13.
- The cooling tower basins are subject to reuse. It is proposed that the south cooling tower basin shall be used to locate the Silo Maintenance Facility, this is a key operational plant required to deliver the high hazard decommissioning on the legacy silos. Site investigation work shall commence in 2011. It is proposed to reuse the north cooling tower basin and number of options have been identified.
- Defuelling - Defuelling operations shall commence in line with MOP requirements.
- Progress the demolition of redundant portacabins.

7. Environmental Performance

It is a requirement of the conditions attached to the Consent that this EMP reports on the effectiveness of the mitigation measures over time. This will be achieved by updating this section each time the EMP is reviewed (normally annually).

The environmental performance review has been structured by first reviewing any unplanned events with environmental consequences that have occurred and then reviewing the mitigation measures associated with each of the specialist topic areas identified in the Environmental Statement. Since Calder Hall is currently in the 'Defuelling and Preparations' phase, only the mitigation measures identified for this phase have been reviewed.

Unplanned Events:

There have been no significant environmental events during the period of the decommissioning project, ie since Consent was received in June 2005.

Calder Hall operates an open reporting regime whereby minor events, near misses and safety and environmental concerns are recorded and investigated. The objective of this is to learn from all events however small in consequence so as to minimise the risk of any significant events. In 2010/11, one such event was recorded as having the potential for environmental concern. During routine sampling on 14th January 2011 increased pH levels were identified at outfall L on the Calder interceptor sewer. This sample was found to have elevated levels (pH ~10.5) exceeding the consented limit (pH9). The amount of liquor involved was small and has been confirmed to have had no effect on the daily average pH readings further downstream at the outfall of the Calder Interceptor Sewer to the Irish Sea. The source of the high pH reading was traced upstream to a surface water drain pit. This pit was found to hold a quantity of liquid of increased pH (~12), and a small amount was seen to be trickling from the inlet pipe into this pit. The pit was isolated from the rest of the drainage system and the contents pumped into an Intermediate Bulk Container for disposal to the Sellafield Effluent Treatment Plant by the Calder Hall active effluent disposal and no further elevated pH discharges have been found. The source of the chemical contamination is thought to be historic from a dosing agent used in the boilers when the reactors were generating.

Air Quality and Climatic Factors:

No significant adverse environmental impacts were identified in the Environmental Statement.

Archaeology and Cultural Heritage:

English Heritage have no current interest in the Site.

Ecology:

No liquid discharges have been made to the River Calder as part of decommissioning operations. No buildings have been demolished during the period of this report and consequently, no bat roost surveys have been carried out.

A preliminary bat assessment was undertaken in April 2004, (Appendix 10.3, Environmental Statement). It was concluded that the Calder Site may well be a suitable feeding area for bats with some potential roost/ hibernation locations, although none were observed. Further surveys were recommended before any new demolition.

Geology, Hydrogeology and Soils:

No radioactive or non-radioactive ground contamination has been identified as part of the decommissioning operations to date but soil sampling will be undertaken around any proposed excavations. This will be used to decide whether soil needs to be removed and managed to prevent the spread of any existing contamination. If any soil contamination is identified water ingress to excavations will be controlled as much as possible and any water entering excavations will be sampled

and analysed.

Decommissioning work to date has not required the local storage of significant quantities of fuel oils or chemicals. However, the small quantities that have been used, have been stored within appropriate bunded areas.

Landscape and Visual:

No significant adverse environmental impacts were identified in the Environmental Statement. However, it did identify that a visual benefit will occur with the demolition of the cooling towers which has now been completed and the bases have been cleared up.

Noise and Vibration:

Decommissioning to date has not involved activities which cause significant noise off-site. Fine cleaning of plant to remove residual asbestos fibres after the asbestos strips uses a form of shot blasting. This is a noisy operation for the operatives and hearing protection is required, but has low impact off-site.

The demolition of the cooling towers had an off-site noise impact at the time of the actual demolitions. A stakeholder plan was put in place to ensure that the affected people off-site were informed in advance, and to ensure that road traffic was managed to avoid any adverse impact.

Socio-Economic:

The number of Sellafield Ltd employees working at Calder Hall has decreased since the Calder reactors ceased electricity generation. In May 2010 a reorganisation was undertaken to integrate all Calder activities including asset care, defuelling and maintenance and this is the reason for the apparent increase in SL employees.

	2006	2007	2008	2009	2010	2011
SL employees	153	120	24	20	75	73
Contractors	174	173	142	80	80	70

Sellafield Ltd. continue to give financial support for job creation initiatives in West Cumbria. The company also encourages contractors to make use of locally sourced labour, equipment and services wherever practicable.

Surface Water Quality and Drainage:

No liquid discharges have been made to the River Calder as part of decommissioning operations. Precautions were taken to ensure that there were no releases of contaminants from vehicles, such as prohibiting vehicle movements in the cooling tower area during wet weather to minimise the spread of material to roads etc. Measures used to prevent pollution of watercourses include the temporary blocking of drains, the survey of possible water run-off routes and the use of bunds. Spill kits are available as a precaution.

Traffic and Transport:

No significant adverse environmental impacts were identified in the Environmental Statement. However, a Traffic Management Plan is included in the Environmental Management Plan (Appendix 1). Some measures have already been taken to reduce the impact of traffic movements. These include a fence around the Calder Hall Site to limit movements of vehicles onto site and to restrict through traffic. A scheme to encourage the use of pedal cycles using tax incentives for cycle purchase has been

implemented and vehicular access to Sellafield Site in general has been restricted using the Single Occupancy Vehicular Access, SOVA, scheme.

Although decommissioning to date has not required a significant amount of off-site traffic movements, those undertaken have been in accordance with the Transport Management Plan principles.

8. Mitigation Measures

There are no significant changes to the mitigation measures that were submitted in the Environmental Statement and reported in this Environmental Management Plan. The following tables list the mitigation measures for each phase of the decommissioning project at Calder Hall. These measures will be incorporated in the project planning by the Project Manager, in consultation with the Environmental Performance Manager. The extent and duration of the mitigation measures will be considered during the planning for each project.

Independent Audit

In order to monitor any adverse environmental effects of decommissioning work, an independent audit is currently being considered.

Defuelling, Preparations and Interim Decommissioning

Environmental Impact	Mitigation Measures	Action
Air Quality and Climatic Factors		
No significant adverse environmental impacts identified arising from decommissioning activities.		
Measurements of dust production and deposition were made at the time of the cooling tower demolition by Westlakes Scientific Consulting, (project number P07011, Dust Monitoring and Analysis). Laser nephelometers were used to measure airborne dust concentration levels. Occupational exposure to the dust was controlled using an exclusion zone and by restricting access to Sellafield Site. Occupational exposure levels were not breached. Dust deposition gauges were used to measure and collect dust samples for radioactivity analysis. Increased levels of Cs-137, Pu-alpha and Am-241 were observed but these levels were low compared to deposition from historical discharges.		
Ecology		
Surface water quality		
<ul style="list-style-type: none"> Release of contaminants and resulting reduction in water quality of the River Calder and its confluence with the River Ehen, which could impact aquatic ecological receptors 	<ul style="list-style-type: none"> Adoption of best management practices to ensure that any discharge complies with EA consent (e.g. EA PPGs ⁸ and CIRIA ⁹ guidance) Prevention of uncontrolled releases of contaminants from vehicles (e.g. wheel washes on site and protective butts on bridge crossings) 	<ul style="list-style-type: none"> These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans
Bats		
<ul style="list-style-type: none"> If bat roosts/hibernacula are present, demolition of buildings that support bats could result in their injury or death 	<ul style="list-style-type: none"> Surveys, by a qualified expert will be undertaken for each building that may contain roosts/hibernacula prior to demolition. Where necessary, any entrances to roosts/hibernacula will be blocked (under licence from DEFRA) and alternative roosts/hibernacula will be provided 	<ul style="list-style-type: none"> 'Hold points' will be established in individual decommissioning project plans for potentially affected buildings
Peregrine		
Disturbance of nesting peregrine	Suitable nest sites will be checked, by a qualified expert, prior to any demolition works that are carried out during the breeding season (March-July). If nesting peregrine are present, demolition works that could have an impact on them will be postponed until after the breeding season	<ul style="list-style-type: none"> If the demolition of any structure is planned during the peregrine breeding season, checks will be undertaken to ensure that no nests are located on them. If any peregrine are found to be nesting the demolition programme will be delayed

⁸ PPGs (Pollution Prevention Guidance Notes) are published by the Environment Agency(EA) to provide guidance relevant to a wide range of industrial activities. Further details are available at the EA website <http://www.environment-agency.gov.uk/>

⁹ A company owned by other companies, universities, government departments and other public sector agencies, organisations and regulators. CIRIA's primary aims are to improve the quality, efficiency, cost-effectiveness and safety of both the provision and operation of the modern built environment. Further information is available on the CIRIA website <http://www.ciria.org.uk/>

Environmental Impact	Mitigation Measures	Action
Geology, Hydrogeology and Soils		
Non-radioactive contamination		
<ul style="list-style-type: none"> Disturbance of existing ground contamination (eg removal of underground storage tanks and pipelines), involving exposure or spread of contaminants and possible subsequent rainwater leaching or groundwater ingress 	<ul style="list-style-type: none"> Before any excavation of soil that may be required, ground will be surveyed to ensure that no contamination is present Any soils identified as contaminated will be segregated from non-contaminated soils and carefully managed to prevent spread of contamination, then disposed of off-site at appropriate disposal facilities, subject to the necessary regulatory permissions Any water ingress to excavation areas will be controlled to minimise the volume of water that could become contaminated (if contamination were present) and require subsequent management Where soil contamination is identified, any water that enters excavations will also be sampled and analysed. If there is a need to pump contaminated water out of excavations, this will be done such as to ensure that the waste water is disposed of appropriately Any excavated material will be monitored prior to reuse as infill 	<ul style="list-style-type: none"> These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans
<ul style="list-style-type: none"> Contamination arising from temporary storage of demolition materials, by mobilisation or mixing/movement 	<ul style="list-style-type: none"> Demolition wastes will be subject to analysis to determine their suitability for later use as a backfill material to below-ground voids on the site Demolition wastes identified as contaminated will be appropriately managed 	<ul style="list-style-type: none"> These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans
<ul style="list-style-type: none"> Spills and leaks of non-radioactive chemicals 	<ul style="list-style-type: none"> Fuel and lubricating/hydraulic oil or other chemicals stored on site will be stored in tanks located within bunded facilities, as recommended in PPG 2¹⁰ and PPG 6¹¹ Refilling or emptying of these tanks will be in accordance with the guidelines in PPG 6 and PPG 11¹² Any accidental spills of fuel/oil/chemicals will follow procedures in the Spill Response Plan for the site compliant with PPG 21¹³ 	<ul style="list-style-type: none"> Routine control will be enforced through existing site procedures. Any additional requirements will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans
Radioactive contamination		
<ul style="list-style-type: none"> Disturbance of existing ground contamination, involving exposure or spread of contaminants and possible subsequent rainwater leaching or groundwater ingress 	<ul style="list-style-type: none"> As above 	<ul style="list-style-type: none"> As above
<ul style="list-style-type: none"> Contamination arising from temporary storage of demolition materials, by mobilisation or mixing / movement 	<ul style="list-style-type: none"> As above 	<ul style="list-style-type: none"> As above

¹⁰ PPG2 – Above ground oil storage tanks ¹¹ PPG6 – Working at construction and demolition sites ¹² PPG11 – Preventing pollution at industrial sites

¹³ PPG21 – Pollution incident response planning

Environmental Impact	Mitigation Measures	Action
Landscape and Visual		
<ul style="list-style-type: none"> No significant adverse environmental impacts identified arising from decommissioning activities. 		
Noise and Vibration		
Local Residential Properties		
<ul style="list-style-type: none"> Noise and vibration generated during construction work 	<ul style="list-style-type: none"> Good working practices to ensure noise and vibration generation is minimised Cumbria and Lancashire Health Protection Unit will be informed of significant noise generating activities during decommissioning 	<ul style="list-style-type: none"> These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans
Socio-economic		
Employment/ Unemployment		
<ul style="list-style-type: none"> Long-term loss of 365 job opportunities, including 340 male job opportunities in the Copeland Borough and West Cumbria¹⁴ area combined Increase in unemployment of up to 265 (worst case) in West Cumbria Increase in unemployment of up to 200 (worst case) in Copeland 	<ul style="list-style-type: none"> Sellafield Ltd will attempt to re-deploy affected staff (including in West Cumbria) and will provide opportunities for early retirement Sellafield Ltd will continue its current financial support for job creation initiatives in West Cumbria Additional mitigation will result from the wider regeneration initiatives currently being undertaken in West Cumbria (eg through the activities of West Lakes Renaissance) Sellafield Ltd will continue to engage with relevant stakeholders (including Cumbria County Council, Copeland Borough Council and NDA) with regard to the socio-economic issues arising from the decommissioning programme at Calder Hall 	<ul style="list-style-type: none"> During the post-operational transition, affected staff were re-deployed and opportunities were provided for early retirement. Any future changes will continue to utilise the established HR policies and practices These activities will be developed in the future in consultation between Sellafield Ltd and the NDA A sub-committee of the West Cumbria Site Stakeholder Group will be established for Calder Hall and this will be the main focus for engagement with the relevant stakeholders

¹⁴ West Cumbria was the study area used in the environmental impact assessment. This is the area covered by the Whitehaven and Workington Travel to Work Areas as used in study prepared for the Environment Council [ERM Economics (2003) West Cumbria: Socio-Economic Study - 2003 Update]

Environmental Impact	Mitigation Measures	Action
Surface Water Quality and Drainage		
Turbid Water		
<ul style="list-style-type: none"> Release of turbid water into River Calder and its tributary, impacting aquatic ecology and water quality 	<ul style="list-style-type: none"> Adoption of best management practices to control release of turbid water (eg EA PPGs and CIRIA guidance) such as buffer strips next to watercourses, cut-off drains, sumps for collecting turbid water, minimisation of soil stockpiling and diversion of any site runoff in close proximity to watercourses Surface water discharges will be made in accordance with site discharge limits 	<ul style="list-style-type: none"> These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans
Traffic Related Effects		
<ul style="list-style-type: none"> Release of turbid water and other pollutants from traffic, impacting aquatic ecology and water quality 	<ul style="list-style-type: none"> A wheel wash will clean all traffic leaving the site Water used in the wheel wash will be recycled, thereby avoiding discharges into the aquatic environment All roads close to the decommissioning site will be kept swept to ensure that there is no soiling of public highways Protective butts on bridge crossings will prevent turbid water running off bridges into the River Calder Vehicles will also be kept in good working order and checks will be made as part of routine environmental audits of the operations 	<ul style="list-style-type: none"> These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans These mitigation measures will be considered as part of the development of the Transport Management Plan

Environmental Impact	Mitigation Measures	Action
Minor Spills and Leaks		
<ul style="list-style-type: none"> Minor spills and leaks of non-radioactive chemicals, impacting aquatic ecology and water quality 	<ul style="list-style-type: none"> All chemicals, fuels, lubricants, oils and other potential contaminants will be stored on-site in designated areas in accordance with best practice and EA PPGs Designated refuelling bays will be used to refuel plant and vehicles Drip trays and bunds will provide protection from spills and leaks Oil and fuel will be stored within impermeable bunds that will provide 110% of the stored volume Spill response kits will be available 	<ul style="list-style-type: none"> Routine control will be enforced through existing site procedures. Any additional requirements will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans
Traffic and Transport		
<ul style="list-style-type: none"> No significant adverse environmental impacts identified arising from decommissioning activities. 		

Activities where mitigation may be required but specific measures cannot yet be selected (Condition 3b)

Environmental Impact	Mitigation Measures Under Consideration
<ul style="list-style-type: none"> Migration of existing ground contamination (radioactive and/or non-radioactive) from the main Sellafield site to Calder Hall 	<ul style="list-style-type: none"> Excavate and segregate contaminated from non-contaminated soils then dispose of to appropriate disposal facilities, subject to the necessary regulatory permissions Monitor in situ if further migration of contamination is unlikely Decontaminate soil if practicable

Activities where mitigation may be required but it is not yet possible to identify possible mitigation measures (Condition 3c)

CARE AND MAINTENANCE

Environmental Impact	Mitigation Measures	Action
<ul style="list-style-type: none"> During care and maintenance no significant works are planned with the possible exception of re-cladding the reactor buildings (should this be required). It is anticipated that the reactors would be re-clad in a similar material to that used at the start of care and maintenance hence the visual impact will remain unchanged No other significant adverse environmental impacts were identified during care and maintenance 	<ul style="list-style-type: none"> No mitigation measures are required 	<ul style="list-style-type: none"> None required

FINAL SITE CLEARANCE

Mitigation measures already identified (Condition 3a)

Environmental Impact	Mitigation Measures	Action
Air Quality and Climatic Factors		
<ul style="list-style-type: none"> No significant adverse environmental impacts identified arising from decommissioning activities. 		
Archaeology and Cultural Heritage		
<ul style="list-style-type: none"> The Nuclear Decommissioning Authority has established that English Heritage have no current interest in the Site. 		
Ecology		
Surface water quality		
<ul style="list-style-type: none"> Release of contaminants and resulting reduction in water quality of the River Calder and its confluence with the River Ehen, which could impact aquatic ecological receptors 	<ul style="list-style-type: none"> Adoption of best management practices to ensure that any discharge complies with EA consent (eg EA PPGs and CIRIA guidance) Prevention of uncontrolled releases of contaminants from vehicles (eg wheel washes on site and protective butts on bridge crossings) The mitigation measures listed in the surface water quality and drainage section also apply here 	<ul style="list-style-type: none"> These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans
Bats		
<ul style="list-style-type: none"> If bat roosts/hibernacula are present, demolition of buildings that support bats could result in their injury or death 	<ul style="list-style-type: none"> Surveys, by a qualified expert, will be undertaken for each building that may contain roosts/hibernacula prior to demolition, Where necessary, any entrances to roosts / hibernacula will be blocked (under licence from DEFRA) and alternative roosts/hibernacula will be provided 	<ul style="list-style-type: none"> 'Hold points' will be established in individual decommissioning project plans for potentially affected buildings
Peregrine		
<ul style="list-style-type: none"> Disturbance of nesting peregrine 	<ul style="list-style-type: none"> Suitable nest sites will be checked, by a qualified expert, prior to any demolition works that are carried out during the breeding season (March-July). If nesting peregrine are present, demolition works that could have an impact on them will be postponed until after the breeding season 	<ul style="list-style-type: none"> If the demolition of any tower is planned during the peregrine breeding season, checks will be undertaken to ensure that no nests are located on the towers. If any peregrine are found to be nesting the demolition programme will be delayed

Environmental Impact	Mitigation Measures	Action
Geology, Hydrogeology and Soils		
Non-radioactive contamination		
<ul style="list-style-type: none"> Disturbance of existing ground contamination, involving exposure or spread of contaminants and possible subsequent rainwater leaching or groundwater ingress 	<ul style="list-style-type: none"> Before any blasting or excavation of any soil that may be required, ground will be surveyed to ensure that no contamination is present Any soils identified as contaminated will be segregated from non-contaminated soils and carefully managed to prevent spread of contamination, then disposed of off-site at appropriate disposal facilities, subject to the necessary regulatory permissions Any water ingress to excavation areas will be controlled to minimise the volume of water that could become contaminated (if contamination were present) and require subsequent management Where soil contamination is identified, any water that enters excavations will also be sampled and analysed. If there is a need to pump contaminated water out of excavations, this will be done such as to ensure that the waste water is disposed of appropriately Any excavated material will be monitored prior to reuse as infill 	<ul style="list-style-type: none"> These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans
<ul style="list-style-type: none"> Contamination arising from temporary storage of demolition materials, by mobilisation or mixing/movement 	<ul style="list-style-type: none"> Demolition wastes will be subject to analysis to determine their suitability for later use as a backfill material to below-ground voids on the site Demolition wastes identified as contaminated will be appropriately managed 	<ul style="list-style-type: none"> These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans
<ul style="list-style-type: none"> Spills and leaks of non-radioactive chemicals 	<ul style="list-style-type: none"> Fuel and lubricating/hydraulic oil or other chemicals stored on site will be stored in tanks located within bunded facilities, as recommended in EA PPG 2 and PPG 6 Refilling or emptying of these tanks will be in accordance with the guidelines in PPG 6 and PPG 11 Any accidental spills of fuel/oil/chemicals will follow procedures in the Spill Response Plan for the site compliant with PPG 21 	<ul style="list-style-type: none"> Routine control will be enforced through existing site procedures. Any additional requirements will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans
Radioactive contamination		
<ul style="list-style-type: none"> Disturbance of existing ground contamination, involving exposure or spread of contaminants and possible subsequent rainwater leaching or groundwater ingress 	<ul style="list-style-type: none"> As above 	<ul style="list-style-type: none"> As above
<ul style="list-style-type: none"> Contamination arising from temporary storage of demolition materials, by mobilisation or mixing/movement 	<ul style="list-style-type: none"> As above 	<ul style="list-style-type: none"> As above

Environmental Impact	Mitigation Measures	Action
Landscape and Visual		
<ul style="list-style-type: none"> No significant adverse environmental impacts identified arising from decommissioning activities 		
Noise and vibration		
Local Residential Properties		
<ul style="list-style-type: none"> Noise and vibration generated during construction work 	<ul style="list-style-type: none"> Good working practices to ensure noise and vibration generation is minimised 	<ul style="list-style-type: none"> These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans
Socio-economic		
<ul style="list-style-type: none"> No significant adverse environmental impacts identified arising from decommissioning activities. 		
Surface Water Quality and Drainage		
Turbid Water		
<ul style="list-style-type: none"> Release of turbid water into River Calder and its tributary, impacting aquatic ecology and water quality 	<ul style="list-style-type: none"> Adoption of best management practices to control release of turbid water (eg EA PPGs and CIRIA guidance) such as , buffer strips next to watercourses, cut-off drains, sumps for collecting turbid water, minimisation of soil stockpiling and diversion of any site runoff in close proximity to watercourses Surface water discharges will be made in accordance with site discharge limits 	<ul style="list-style-type: none"> These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans
Traffic Related Effects		
<ul style="list-style-type: none"> Release of turbid water and other pollutants from traffic, impacting aquatic ecology and water quality 	<ul style="list-style-type: none"> A wheel wash will clean all traffic leaving the site Water used in the wheel wash will be recycled, thereby avoiding discharges into the aquatic environment All roads close to the decommissioning site will be kept swept to ensure that there is no soiling of public highways Protective butts on bridge crossings will prevent turbid water running off bridges into the River Calder Vehicles will also be kept in good working order and checks will be made as part of routine environmental audits of the operations 	<ul style="list-style-type: none"> These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans These mitigation measures will be considered as part of the development of the Transport Management Plan

Environmental Impact	Mitigation Measures	Action
Minor Spills and Leaks		
<ul style="list-style-type: none"> Minor spills and leaks of non-radioactive chemicals, impacting aquatic ecology and water quality 	<ul style="list-style-type: none"> All chemicals, fuels, lubricants, oils and other potential contaminants will be stored on-site in designated areas in accordance with best practice and PPGs Designated refuelling bays will be used to refuel plant and vehicles Drip trays and bunds will provide protection from spills and leaks Oil and fuel will be stored within impermeable bunds that will provide 110% of the stored volume Spill response kits will be available 	<ul style="list-style-type: none"> Routine control will be enforced through existing site procedures. Any additional requirements will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning project plans
Traffic and Transport		
<ul style="list-style-type: none"> No significant adverse environmental impacts identified arising from decommissioning activities. 		

Activities where mitigation may be required but specific measures cannot yet be selected (Condition 3b)

Environmental Impact	Mitigation Measures Under Consideration
<ul style="list-style-type: none"> Migration of existing ground radioactive and/or non-radioactive contamination from the main Sellafield site to Calder Hall 	<ul style="list-style-type: none"> Excavate and segregate contaminated from non-contaminated soils then dispose of to appropriate disposal facilities, subject to the necessary regulatory permissions Monitor in situ if further migration of contamination is unlikely Decontaminate soil if practicable

Activities where mitigation may be required but it is not yet possible to identify possible mitigation measures (Condition 3c)

Environmental Impact
<ul style="list-style-type: none"> Additional mitigation measures (or any changes required to those measures listed above) for activities during final site clearance will be based on the technologies available at that time, decommissioning experience and any future environmental assessment deemed necessary.

APPENDIX 1 - TRANSPORT MANAGEMENT PLAN

Objective

As with any construction or demolition project, the decommissioning of Calder Hall will involve a significant number of transport movements, particularly in the interim decommissioning and the final site clearance stages. All decommissioning operations involving transport will be managed so as to minimise the environmental effects of these operations, as far as is reasonably practicable. The principles for achieving this are defined in this initial Transport Management Plan for the interim decommissioning period. This will develop as the detailed arrangements for decommissioning develop and future revisions will include more detail. Implementation will be managed through Management Plans for the individual projects.

Compared to other reactor decommissioning sites, the effects of these movements will be smaller in the interim decommissioning phase due to:

- The limited requirement for new buildings and associated construction traffic;
- The lower number of significant buildings to demolish since Calder Hall does not have dedicated fuel storage ponds or effluent treatment plant;
- The availability of rail transport for movement of low level waste to LLWR; and
- The impact on the number of transport movements from the Sellafield Site as a whole is less with Calder Hall being situated on the much larger industrial complex.

Transport Management Principles

- Low level waste will be transported by rail to the national LLWR.
- HGVs will be required to exit the site through the Sellafield Main Gate and, where appropriate, to follow a preferred trunk road route;
- The numbers of individual transport movements will be minimised as far as is reasonably practicable;
- Employees and contractors will be encouraged to share transport (or use public transport) when travelling to and from the Calder Hall site;
- Sellafield Ltd and their contractors will be required to use and maintain their vehicles in a good standard of condition. This will be monitored by Sellafield Ltd.
- When appropriate, vehicles leaving demolition sites will be subject to wheel wash and inspection to ensure that earth and other material is not unduly dispersed;
- On-site roads will be swept as necessary to minimise the spread of material off-site and/or into drains or watercourses. Where appropriate, drains and watercourses will be protected;
- Signage will be provided at site exits to reinforce the contract requirements on vehicle drivers;
- Where practicable, transport distances will be minimised by the use of local disposal sites, recycling companies, etc.;
- Most HGV transport movements will be undertaken during normal working hours; and
- In the event of need for an abnormal load to be transported, a specific plan for this movement will be developed.

Monitoring and Reporting

Implementation of the transport management principles will be monitored throughout the interim decommissioning period and reported through the periodic reviews of the Environmental Management Plan.

APPENDIX 2 - CONSENT TO DECOMMISSION AND ATTACHED CONDITIONS

1. ANNEX 7 Consent and conditions

Decommissioning Project Consent No.1

June 2005

NUCLEAR REACTORS (ENVIRONMENTAL IMPACT ASSESSMENT FOR DECOMMISSIONING) REGULATIONS 1999

CONSENT

**granted under regulation 4(b)
in accordance with regulation 8(3)
with conditions attached under regulation 8(4)**

CALDER HALL POWER STATION

The Health and Safety Executive, for the purposes of regulation 4(b) in accordance with regulation 8(3), hereby grants consent for carrying out the project 3 applied for under regulation 4(a), in particular, to remove all buildings except the reactor buildings, alter the reactor buildings for a period of deferment, retrieve and transfer intermediate level radioactive waste to Sellafield and clear the site, subject to the conditions under regulation 8(4) attached.

Dated:

For and on behalf of the
Health and Safety
Executive

Signed

Dr A N Hall

A person authorised to act in that
behalf

³ Project as defined in regulation 2



Sellafield Site

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