

# Environment Agency permitting decisions

## Part surrender

We have decided to accept the surrender of part of the permit for Springfields operated by Springfields Fuels Ltd

The permit number is EPR-NP3734SZ

We are satisfied that the necessary measures have been taken to avoid any pollution risk and to return the site to a satisfactory state.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements.

## Purpose of this document

This decision document:

- explains how the operator's application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit as a result of the partial surrender

## Structure of this document

- Key issues
- Annex 1 the decision checklist

## Key issues of the decision

### Introduction

This application for partial surrender was to remove certain listed activities which are no longer carried out in the installation following cessation of the Magnox fuel manufacture in 2012. The land associated with these listed activities has not been surrendered.

As a result of the partial surrender the permit needed to varied. The permit was in the original PPC permit template so has been consolidated and updated it into the latest EPR installation template.

## Summary of Magnox Fuel Manufacturing Process

The manufacture of the Magnox fuel involved a number of different distinct processes on site. These are summarised below:

1. The starting material was uranium ore concentrate which was converted to uranyl nitrate in the UN production plant.
2. The purified uranyl nitrate was then converted into uranium trioxide (UO<sub>3</sub>) powder in the UO<sub>3</sub> production plant.
3. UO<sub>3</sub> was converted in to uranium tetrafluoride (UF<sub>4</sub>) in the UF<sub>4</sub> production plant.
4. The UF<sub>4</sub> was then reacted with magnesium metal to produce uranium billets in the uranium billet production plant.
5. The uranium billets were then melted under vacuum, flowed into moulds and solidified to produce cast uranium rods in the uranium cast rod production plant.
6. The uranium cast rods were then machine cast into the fuel rods in the uranium machine shop.
7. The fuel rods were then degreased and checked for final specification in the Magnox finishing plant.

## Changes to Listed Activities

The manufacture of the Magnox fuel was classed as a non-ferrous metal activity under Schedule 1 of the PPC Regulations 2000 (section 2.2 A(1)(a)) when the original permit was issued on 01/04/05. The operations carried out in the UN production plant, UO<sub>3</sub> production plant, UF<sub>4</sub> production plant, uranium billet production plant and uranium cast rod production were all covered by this listed activity.

The machining and final packaging of the uranium metal fuel rods into fuel cans and fuel assemblies were classed as listed activities under Section 7 Part B of Schedule 1 of the PPC Regulations due to the use of trichloroethylene. These activities were carried out in the uranium machine shop and Magnox fuel finishing plant.

The partial surrender application was to enable the listed activities carried out in the uranium billet production plant, uranium cast rod production plant, uranium machine shop and Magnox finishing plant to be removed from the permit.

The operations in the UN production plant, UO<sub>3</sub> production plant and UF<sub>4</sub> production plant are still carried out. Although there have been some changes to the process descriptions, which have been updated in the permit via the minor operational change condition, the activities being carried out are essentially the same as in the original PPC permit. With the cessation of the

Magnox fuel manufacture more apt Schedule 1 listed activity descriptions apply for these activities.

As a result of updating the permit into the latest template there have been two changes to the existing listed activities/directly associated activities table.

The Schedule 1 listed activity in the Oxide Fuel Complex Conversion plant has been amended from Section 4.1 A(1) (b) to Section 4.1 A(1) (v) to accurately reflect the manufacture of uranium dioxide. The treatment of the process effluents has been changed from a directly associated activity to Section 5.4 A(1) (a)(ii) to cover the pH neutralisation and filtration operations carried out.

Table 1 shows the existing listed activities and changes required as a result of the partial surrender and update of the permit.

Existing Schedule 1 Listed Activity	Plant/Facility	Surrender	New Schedule 1 Listed Activity
Section 2.2 A(1) (a)	UN production plant	<b>No</b> – continues producing uranyl nitrate from processing of natural uranium residues. Name change to Natural Residues Recovery Plant.  Change Schedule 1 listed activity	Section 4.2 A(1) (a) (v)
	UO <sub>3</sub> production plant	<b>No</b> – continues to receive uranyl nitrate from Natural Residues Recovery Plant  Change Schedule 1 listed activity	Section 4.2 A(1) (a) (v)
	UF <sub>4</sub> production plant	<b>No</b> – continues to convert UO <sub>3</sub> to UF <sub>4</sub> . Feedstock bought in directly not from UO <sub>3</sub> production plant.  Change Schedule 1 listed activity	Section 4.2 A(1) (b)
	Uranium billet production plant	<b>Yes</b> - all operations have ceased	Not applicable
	Uranium cast rod production plant	<b>Yes</b> – all operations have ceased	Not applicable
Section 7 B	Uranium machine shop	<b>Yes</b> - all operations have ceased	Not applicable
	Magnox fuel finishing plant	<b>Yes</b> - all operations have ceased	Not applicable
Section 4.2 A(1) (B)	OFC Conversion	<b>No</b> – more appropriate listed	Section 4.2 A(1) (a) (v)

		activity description applies Change Schedule 1 listed activity	
Directly associated activity	Effluent treatment	<b>No</b> – treatment of more than 50 tonnes per day of non-hazardous waste for disposal is classed as a listed activity  Add new Schedule 1 listed activity	Section 5.4 A1 (a) (ii)

### **Extent of Activities**

The activities that are being surrendered take place in two separate buildings in a central part of the site. A site plan has been included in the partial surrender application showing the area where these listed activities were carried out in relation to the other activities on site.

Whilst a partial surrender is the only way to remove these listed activities from the permit there is no intention to surrender the land associated with these buildings and activities and the site plan and installation boundary is not affected by this partial surrender application. Furthermore this land is still subject to the ongoing land and groundwater monitoring as part of the site protection and monitoring programme (SPMP) which was a requirement of the original PPC permit issued on 01/04/05.

### **Site Plans**

There has been a minor amendment to the installation boundary as shown in the original site plan. This is a result of the site boundary changing following the selling off of a recreation building to F2 Chemicals which adjoins Springfields Fuel Ltd. There were no manufacturing operations carried out in the vicinity of this recreational building and no land contamination issues.

Updated site plans have been included in the consolidated permit. There is one plan showing the installation boundary which incorporates the discharge pipeline to the River Ribble and an additional site plan showing the site boundary.

### **Emissions to Air**

There have been some changes to listed emission points as a result of the partial surrender application and the permit update.

Emission points G152 and G153 relating to degreasing bays 3 and 4 in the Magnox fuel finishing plant have been removed.

Emission point A3 now only refers to the gas turbine as the source of emissions as the waste heat recovery boiler has been removed.

Emission point G63 which is the release point from line 1 & 2 fluorine cells extract system is now included.

Trichloroethylene is no longer used follow cessation of the Magnox fuel manufacture and annual mass limits have been removed along with the relevant reporting requirements.

### **Pollution Risk**

The listed activities to be surrendered (uranium billet production, uranium cast rod production, machining and Magnox fuel finishing) were carried out in two distinct buildings in a central area of the site (Buildings 331 and 338). Both buildings have been subject to post operational clean out. This involved stripping out all equipment, materials and chemicals from the buildings including all polluting substances. The main polluting substances were trichloroethylene and oils.

The Environment Agency Site Inspector carried out inspections of both buildings (December 2014 and March 2016) to verify that all polluting materials relating to these activities have been removed. This includes the removal of the bulk trichloroethylene tank outside building 331.

Furthermore routine inspections of the buildings have also been undertaken by the Office for Nuclear Regulation a part of routine interventions for these facilities to ensure all nuclear material (uranium) has been removed.

The second phase of the decommissioning of the buildings will involve demolition to the base slab. This is schedule to take place in 2017 for Building 331 and 2020 for Building 338. The reason for the longer timescale for building 338 is there are shared services with existing production facilities.

We are satisfied that there is no pollution risk remaining from the listed activities which the partial surrender application relates to.

### **Returning the Land to Satisfactory State**

The land associated with the listed activities to be surrendered is not being surrendered as part of the partial surrender application, therefore, there is no requirement to ensure it has been returned to a satisfactory state.

As part of the original PPC permit application a two phase site investigation was undertaken to establish baseline soil and groundwater conditions. The first phase involved a desk top study to identify potential contamination associated with the historical operations carried out on site. The second phase involved an intrusive survey over the site with 134 locations, 19 associated with groundwater monitoring.

A Site Protection and Monitoring Programme (SPMP) has been developed and biannual groundwater monitoring is now carried out at 35 locations across the site. These are monitored for a variety of metals, anions and a subset for organics (volatile organic compounds (VOCs) and Total Petroleum Hydrocarbons (TPH)) as well as alpha and beta activity as required by the EPR-RSA permit.

There are 5 groundwater monitoring boreholes (112p1, 127p1, SP7077p1, SP6732p1 & SP6745p1) in the vicinity of Buildings 331 and 338. Three of these (112p1, SP6732p1 & SP7077p1) are part of the SPMP. The partial surrender application includes a comparison of the levels of contaminants in these boreholes with the baseline levels.

For all the metals and anions the levels are at the baseline levels.

For ammoniacal nitrogen there are minor variations in concentrations around the baseline levels reflected by changes in redox values.

There have been occasional detections of TPH in borehole 112p1 likely to be linked to residual low level historical contamination in the area.

VOCs have been detected in boreholes 112p1 and SP6732p1. These are suggested to be residual contamination from raw materials and their breakdown products. Concentrations have fluctuated in the last few years with increased levels coinciding with demolition/repair works suggesting remobilisation.

## Annex 1: decision checklist

This document should be read in conjunction with the Duly Making checklist, the application and supporting information and permit/ notice.

Aspect considered	Justification / Detail	Criteria met
		Yes
<b>The permit conditions</b>		
Changes to permit conditions	<p>The permit conditions have changed as a result of the partial surrender.</p> <p>Refer to Changes to Listed Activities, Site Plan &amp; Emissions to Air in the Key Issues section</p>	✓
<b>The site</b>		
Extent of the surrender application	<p>There is no change to the site plan as a result of this partial surrender. The application was to surrender certain listed activities carried out as part of the Magnox fuel manufacturing process. These listed activities were Uranium Billet production, Uranium Cast Rod production, Uranium Machine Shop and Magnox Fuel Finishing Plant. The land associated with these activities has not been surrendered and remains within the site plan and there is no change to the installation boundary. Furthermore this land is still subject to the ongoing land and groundwater monitoring as part of the site protection and monitoring programme (SPMP) which was a requirement of the original PPC permit issued on 01/04/05.</p>	✓
Pollution risk	<p>We are satisfied that the necessary measures have been taken to avoid a pollution risk resulting from the operation of the regulated facility.</p> <p>The listed activities which have been surrendered were carried out in two separate buildings (331 &amp; A38). Post operational clean out (POCO) has been carried out for both buildings which involved the removal of all equipment, materials and chemicals from the buildings, including all polluting substances. Inspections have been carried out by the Environment Agency Site Inspector to verify that all polluting substances associated with these listed activities have been removed.</p>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
Satisfactory state	<p>We are satisfied that the necessary measures have been taken to return the site of the regulated facility to a satisfactory state.</p> <p>In coming to this decision we have had regard to the state of the site before the facility was put into operation.</p> <p>There is no intention to surrender the land associated with the listed activities which have been surrendered. Ongoing groundwater monitoring is being carried out as part of the SPMP for the site and will continue for these areas. Concentrations are at baseline levels with the occasional fluctuation associated with mobilisation due to demolition work.</p>	✓