

# FCC Environment Tarbothill

## Permit application

**PPC-A-1144226**

### CONTENTS

FCC ENVIRONMENT.....	1
TARBOTHILL .....	1
CONTENTS .....	1
1 NON TECHNICAL SUMMARY OF DETERMINATION .....	3
2 EXTERNAL CONSULTATION AND SEPA'S RESPONSE .....	3
3 ADMINISTRATIVE DETERMINATIONS .....	5
4 INTRODUCTION AND BACKGROUND .....	5
4.1 Historical Background to the activity and application .....	5
4.2 Description of activity.....	5
4.3 Guidance/directions issued to SEPA by the Scottish Ministers under Reg.60 or 61. ....	6
4.4 Identification of important and sensitive receptors.....	6
5 KEY ENVIRONMENTAL ISSUES.....	6
5.1 Summary of significant environmental impacts .....	6
5.2 Point Sources to Air.....	6
5.3 Point Source Emissions to Surface Water and Sewer.....	6
5.4 Point Source Emissions to Groundwater .....	6
5.5 Fugitive Emissions to Air .....	6
5.6 Fugitive Emissions to Water .....	7
5.7 Odour .....	7
5.8 Management.....	7
5.9 Raw Materials .....	7
5.10 Raw Materials Selection .....	8
5.11 Waste Minimisation Requirements .....	8
5.12 Water Use .....	8
5.13 Waste Handling .....	8
5.14 Waste Recovery or Disposal .....	8
5.15 Energy.....	8
5.16 Accidents and their Consequences.....	8
5.17 Noise.....	9
5.18 Monitoring .....	9
5.19 Closure .....	10

Permit (Application) Number:
Applicant:

5.20	Site Condition Report (and where relevant the baseline report) .....	10
5.21	Consideration of BAT .....	10
6	OTHER LEGISLATION CONSIDERED .....	10
7	ENVIRONMENTAL IMPACT ASSESSMENT AND COMAH .....	11
8	DETAILS OF PERMIT .....	11
9	EMISSION LIMIT VALUES OR EQUIVALENT TECHNICAL PARAMETERS/ MEASURES .....	12
10	FINAL DETERMINATION.....	13
11	REFERENCES AND GUIDANCE .....	13

Permit (Application) Number:

Applicant:

## 1 NON TECHNICAL SUMMARY OF DETERMINATION

This application provides details of a new permanent reverse osmosis (RO) treatment process that will be used to remove the potentially polluting properties of landfill leachate that is produced as a result of landfill activities at Tarbothill. The treatment process is based on a 3-stage reverse osmosis system that removes organic and inorganic contaminants from the leachate. Leachate is a liquid which is formed when water passes through waste in a landfill cell. The precipitation can be from rain, melted snow or the waste itself. As the liquid moves through the landfill many organic and inorganic compounds, like heavy metals, are transported in the leachate which percolates down to the base of the landfill cell and collects in the drainage layer. From here it is pumped via vertical chambers into storage tanks prior to treatment.

The proposed method of treatment involves the physicochemical treatment of non-hazardous waste for disposal over 50 tonnes/ day and so is a listed activity within the Pollution Prevention and Control (Scotland) Regulations 2012. The Schedule 1 reference for this activity is covered under Section 5.4 Part A(1)(a)(ii).

The installation of a reverse osmosis (RO) leachate treatment plant is designed to improve the management of a landfill leachate produced at the site. Currently this material is removed by tanker from the site without further treatment and sent to a waste treatment plant for disposal. The new RO process will facilitate the treatment of the landfill leachate to remove organic and inorganic contaminants. The end-products of the RO process will be an aqueous filtrate that is capable of being discharged to surface water and a small volume of aqueous concentrate that will be removed by tanker for off-site treatment/disposal. In preparing this PPC application an evaluation of the potential environmental and health impacts from the RO process were undertaken and it was concluded that there was no detrimental impact on the environment or human health in relation to overall site operations as a result of an RO plant installation and process.

The assessment indicates that the RO process:

- Significantly reduces the volume of landfill leachate requiring final disposal at off site treatment facilities;
- Significantly reduces the number of tanker movements associated with the removal of leachate for off-site treatment/disposal and in doing so reduces the environmental and social impact associated with the vehicle use;
- Has no overall detrimental impact in relation to the environmental or human health impact of site operations

### ***Glossary of terms***

BAT - Best Available Techniques  
CO - Coordinating Officer  
ELV - Emission Limit Value  
RO - Reverse Osmosis

## 2 EXTERNAL CONSULTATION AND SEPA'S RESPONSE

***Is Public Consultation Required -YES***

Permit (Application) Number:
Applicant:

<b>Advertisements Check:</b>	<b>Date</b>	<b>Compliance with advertising requirements</b>
Edinburgh Gazette	15/3/2017	Yes
Press and Journal	06/06/2017	Yes
<b>No. of responses received:</b> None		
<b>Summary of responses and how they were taken into account during the determination:</b> N/A		
<b>Is PPC Statutory Consultation Required – YES</b>		
<b>Food Standards Agency:</b> Response received(27/03/2017) no concerns		
<b>Grampian Health Board:</b> Notified 9/03/2017- no response received		
<b>Aberdeenshire Local Auth:</b> Notified 23/03/2017- no response received		
<b>Scottish Water:</b> N/A		
<b>Health and Safety Executive:</b> Notified 9/03/2017- no response received		
<b>Scottish Natural Heritage (PPC Regs consultation):</b> N/A		
<b>Harbour Authority:</b> N/A		
<b>Discretionary Consultation - NO</b>		
<b>Enhanced SEPA public consultation - NO</b>		
<b>'Off-site' Consultation - NO</b>		
<b>Transboundary Consultation - NO</b>		
<b>Public Participation Consultation - YES</b>		
<p><b>STATEMENT ON THE PUBLIC PARTICIPATION PROCESS</b>  The Pollution Prevention and Control (Scotland) Regulations 2012 (schedule 4, para 22) requires that SEPA's draft determination of this application be placed on SEPA's website and public register and be subject to 28 days' public consultation. The dates between which this consultation took place, the number of representations received and SEPA's response to these are outlined below.</p>		
<b>Date SEPA notified applicant of draft determination</b>		
<b>Date draft determination placed on SEPA's Website</b>		

Permit (Application) Number:

Applicant:

**Details of any other 'appropriate means' used to advertise the draft.**

**Date public consultation on draft permit opened**

**Date public consultation on draft permit consultation closed**

**Number of representations received to the consultation**

**Date final determination placed on the SEPA's Website**

**Summary of responses and how they were taken into account during the determination:**

### **3 ADMINISTRATIVE DETERMINATIONS**

#### **Determination of the Schedule 1 activity**

As per application - Section 5.4 Part A(1)(a) (ii) Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day (or 100 tonnes per day if the only waste treatment is anaerobic digestion) involving one or more of the following activities and excluding covered by the council directive 91/271/EEC concerning urban waste water treatment (ii) physicochemical treatment

#### **Determination of the stationary technical unit to be permitted:**

As detailed in application - Treatment of Leachate by Reverse Osmosis

#### **Determination of directly associated activities:**

As detailed in permit application

#### **Determination of 'site boundary'**

As per application

### **4 INTRODUCTION AND BACKGROUND**

#### **4.1 Historical Background to the activity and application**

Tarbothill is a closed and restored landfill site regulated currently under WML/N/0020151. Since closure in 2002 the site has produced leachate which has been collected and tankered off site for disposal. The quantity of leachate required to be collected and tankered off site has not significantly reduced and is a significant cost both in financial and environmental terms to the company. The aim is to treat the leachate from both Tarbothill and nearby Wester Hatton landfill site by the reverse osmosis process. The end product of the RO process will be an aqueous filtrate that is capable of being discharged to Blackdog burn and a small volume of aqueous concentrate that will be removed by tanker for off-site treatment and disposal.

#### **4.2 Description of activity**

Permit (Application) Number:

Applicant:

The application is for the installation of a reverse osmosis leachate treatment plant, which will treat 70m<sup>3</sup> / day of leachate. The annual maximum throughput of the RO facility will be 25,500 m<sup>3</sup>.

The RO process will significantly reduce the landfill leachate requiring final disposal at off site treatment facilities. It will also significantly reduce the number of tanker movements associated with the offsite disposal/ treatment and in doing so reduces the environmental and social impact of the associated vehicle movements

#### **4.3 Guidance/directions issued to SEPA by the Scottish Ministers under Reg.60 or 61.**

None

#### **4.4 Identification of important and sensitive receptors**

The following sensitive receptors were identified in the application.

Tarbothill landfill is located north east of Bridge of Don, Aberdeen. The site lies adjacent to the A90. The closest human receptors are two residential cottages located 30m south to the southernmost point of the boundary. With Tarbothill farm and a further two properties located a further 200m from the site. To the eastern boundary lies Murcar Links Golf Club and to the northern boundary 250m from the site lies Blackdog residential area.

The Blackdog burn runs north east to east around 175m from the site boundary.

## **5 KEY ENVIRONMENTAL ISSUES**

### **5.1 Summary of significant environmental impacts**

There are no significant environmental impacts from the proposed activities

### **5.2 Point Sources to Air**

There will be no point source emissions to air

### **5.3 Point Source Emissions to Surface Water and Sewer**

There will be a point source emission from the treated permeate from the RO Plant to the Black Dog Burn. Samples were collected from the watercourse to give an outline of the water conditions in the Blackdog Burn. This sample analysis was submitted to Evidence and Flooding along with information supplied by the applicant identifying the concentrations of parameters which are expected to be present in the leachate. The Environmental and Spatial Informatics unit carried out a Monte Carlo Mass Balance Modelling for discharge of the Reverse Osmosis Plant. The results of the modelling were then interpreted by the Team's Water Specialist and discharge quality standards set. The applicant was only able to provide modelled data within the application so accurate results of what could be achieved by the RO plant were not available. It was agreed that the plant would run for a commissioning phase to enable additional sample data to be obtained for the discharge. This additional information has been taken into consideration to ensure appropriate discharge quality standards are set.

### **5.4 Point Source Emissions to Groundwater**

There is no proposed point source release to ground water at the installation

### **5.5 Fugitive Emissions to Air**

The applicant has stated that the only potential for fugitive releases to air at the facility are those associated with odour. See section 5.7 re Odour

## 5.6 Fugitive Emissions to Water

The applicant has stated in section 6 of the review against indicative BAT standards, fugitive emissions to water and sewer would be primarily associated with surface run off from the treatment/storage area.

Any Potential emissions are mitigated as follows:

- Surfacing around the RO plant will be impervious concrete.
- Concrete base will be subject to routine inspection and maintenance to ensure integrity is maintained.
- Storage tanks for leachate, concentrate, permeate and reagents will be fully contained and equipped with online level monitoring.
- Surface run-off would be directed into the existing site drainage system and circulated to the effluent plant for treatment.

These will be regulated by standard permit conditions, no further fixed control required.

## 5.7 Odour

The applicant has stated in section 2.2.6 of the application that with respect to the guidelines outlined in the sector guidance document S5.03 Guidance the treatment of landfill leachate; it is felt that the general BAT principles are met with respect to:

- Employment of basic good practice measures for odour control.
- Provision of odour abatement on the main treatment process.

The control measures specified below are supplementary to the current odour management plan. In designing the RO plant consideration has been given to the following mitigation measures:

- Enclosure of the RO treatment plant will minimise the potential for odour release.
- Carbon filters are used in the ventilation system of the control cabinet room. (cartridge system which is replaceable)
- During plant commissioning, staff training will include raising employee awareness with respect to normal plant operational odour levels and actions to be taken to rectify any faults.
- RO plant doors and hatches will be kept closed when access not required.
- Ensuring the RO process operation is optimised in relation to the treatment process and associated abatement processes.

Odour will be regulated by condition 3.2 of the permit requiring the applicant to produce an Odour Management Plan.

## 5.8 Management

The applicant has stated in section 6.3 of the application that FCC have an existing management system in place which includes documented operational procedures for all elements of the site. Following the commissioning of the new plant, any additional procedures will be incorporated into the system. They will include planned preventative maintenance programme for the plant and its associated infrastructure. The management system will include internal auditing and reporting of results to senior management.

## 5.9 Raw Materials

The applicant has stated in section 6.4 of the application that the raw materials to be used in the process are Sulphuric acid, Caustic Soda, Descaling chemicals and Citric acid ( for membrane cleaning). Periodic review of the materials in the management system will ensure that consideration is given to choosing alternative with improved environmental profile. This will be required to be reviewed under the ISO 140001 Accreditation.

Permit (Application) Number:
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Applicant:
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### 5.10 Raw Materials Selection

The applicant states in section 6.4 of the application that the operator will review the use of process materials at the Site as part of waste minimisation audits which will be carried out periodically. The frequency and scope of the audit will be informed by the environmental aspects and impacts reviews required for the ISO 14001 certified EMS. Raw materials will only be used in the quantities required to prevent operational problems. Records of the quantities of materials used along with operational parameters will enable periodic reviews of the material usage with a view to identifying opportunities for improved efficiency.

Raw materials will be regulated under standard permit conditions

### 5.11 Waste Minimisation Requirements

Waste minimisation will be regulated by standard conditions to; record waste material generation annually, maintain a record of storage locations and to require a 4 yearly review of waste generation to identify methods of minimising waste generation.

### 5.12 Water Use

The applicant has stated in section 6.4 of the application that the leachate will not be diluted with potable water. Only minimal amounts will be used for cleaning of the reverse osmosis plant, as the process is enclosed and it is anticipated it will not require regular cleaning. Water usage is recorded for the site. The water usage on site will be minimal.

### 5.13 Waste Handling

The applicant has stated in section 6.5 of the application, the main aspects of waste handling will be the loading of the leachate concentrate. The remainder of the wastes generated on site will be segregated and stored in suitable containers in an area of concrete hardstanding. The proposal are in line with the S5.03 Guidance

### 5.14 Waste Recovery or Disposal

The applicant has stated in section 6.6 of the application that the concentrate will be dispose of to a suitable permitted treatment facility.

### 5.15 Energy

The applicant has stated in section 6.7 of the application that the plant is new and has been designed with energy efficiency in mind. The main energy use at the plant will be from the high pressure pumps associated with the filtration process, which will operate 365 days per year. A number of process/discharge/dosing pumps will operate intermittently throughout the process. The control panel will record periods when particular equipment is in use and the power consumption of each unit is known. This will provide the ability to accurately monitor and report on the use of energy from different parts of the operation within the plant. This information can be used for periodic reviews of energy use in order to identify potential energy reduction opportunities.

The applicant has listed the proposed energy use as 0.54 Mwh of electricity is to be used from public supply.

The site will not be subject to the climate change levy agreement

### 5.16 Accidents and their Consequences

The applicant has stated in section 6.8 of the application that an emergency action plan will form part of the plant operational procedures, ensuring that all foreseeable accidents are mitigated against and action plans prepared which should be followed by site staff in the event of an accident occurring.

<b>Permit (Application) Number:</b>
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<b>Applicant:</b>
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Accidents and their consequences will be regulated by standard conditions which ensure reporting and recording of incidents.

### 5.17 Noise

The applicant has stated in section 6.9 of their application that with respect to the guidelines outlined in the sector guidance document S5.03 Guidance, it is felt that the general BAT principles are met with respect to:

- Employment of basic good practice measures for noise control.
- Provision of adequate plant maintenance.

Sources of noise associated with the leachate treatment process will include:

- Motors associated with the RO plant.
- Vehicle movements including reversing and loading operations.

In designing the leachate treatment plant consideration has been given to the following mitigation measures

- Motors and drives associated with the RO plant will be selected to minimise potential noise emissions.
- Plant and services will be enclosed as far as practicable to minimise the emission of significant noise levels.
- The manufacturers have stated that the maximum sound level at 1m distance from the container is 80 db (A).

Operational Considerations

- During plant commissioning, staff training will include raising employee awareness with respect to normal plant operational noise levels and actions to be taken to rectify any faults.
- RO plant doors and hatches will be kept closed when access not required.
- During periods of downtime, all plant will be switched off.
- RO plant will be maintained in line with manufacturer's recommendations this includes checking for deterioration of plant condition (e.g. bearings becoming worn). Repairs will be undertaken as appropriate to rectify any identified defects.

Noise Monitoring

Noise levels from the RO process will be evaluated during the commissioning period and if necessary further consideration of noise abatement or attenuation will be completed at this stage.

The complaint procedure for the site will record any noise complaints associated with the site as a whole including the RO process - should complaints be received consideration will be given to boundary monitoring as appropriate.

Noise will be regulated by conditions 3.1 of the permit which states that within 3 months of permit issue and every 5 years after this a systematic assessment of noise associated with the technical stationary unit will be carried out.

### 5.18 Monitoring

The applicant states in section 6.10 of the application that the following monitoring will be carried out:- Continuous monitoring of flow by magnetic inductive flow meter and continuous monitoring of temperature, conductivity and pH within process.

Permit (Application) Number:

Applicant:

Monitoring at the outlet of the Reverse Osmosis plant will be carried out and is covered by condition 4.1 of the permit.

#### 5.19 Closure

The applicant has stated in section 6.11 of the application the operator has in place a system for recording of any incidents, such as spillages that may have led or could lead to ground contamination, and the actions taken. A site closure report will be prepared for the de-commissioning of the plant when the times arises.

#### 5.20 Site Condition Report (and where relevant the baseline report)

Further information was received from the applicant in April 2016 on assessment of this information; the applicant then carried out a ground investigation survey in May 2016. The report detailing the findings was supplied in July 2016. The Baseline report focused on soil samples which were representative of the site. The findings of the sampling concluded that soils and residual subgrade do not contain any significant concentrations of contaminants of concern. The technical stationary unit of the RO Plant is located just outside the infill area of the closed and restored landfill site, which has a monitoring network in place for groundwater and surface water. SEPA's Technical Support Unit provided assistance with ensuring that appropriate conditions are in place; with the applicant required to carry out additional monitoring of ground water and soils in relation to the technical stationary unit within the first 12 months of permit issue and subsequently every 5 and 10 years.

#### 5.21 Consideration of BAT

BAT is discussed against each of the key environmental issues described under Section 4 of the application. Due regards has been given in the BAT reference documents and The BREF's considered were: Sector Guidance Note IPPC S5.03 –Guidance for the Treatment of Landfill Leachate February 2007.

## 6 OTHER LEGISLATION CONSIDERED

### *Nature Conservation (Scotland) Act 2004 & Conservation (Natural Habitats &c.) Regulations 1994*

**Is there any possibility that the proposal will have any impact on site designated under the above legislation? NO**

**Justification:** Having completed the GIS search; SSSI Corby, Lily and Bishops Lochs and SSSI Scotstown Moor are located over 2km from Tarbothill site, as per specification within nature conservation procedure NCP-P-01. The discharge point to the Blackdog burn is located burn is located over 3km from the closest SSSI at Scotstown Moor.

**Screening distance(s) used** – P8 of the SEPA Nature Conservation Procedure for Environmental Licensing sates for PPC (S5.4) Recovery Activities – Part A is 2km

P6 Point source Discharges -In relation to the CAR Complex licence application for surface water the screening distance is 3km

Permit (Application) Number:

Applicant:

Are there any SSSIs within the area screened? No

Are there any SPA or SAC designated areas within the area screened? No

**Other legislation**

The Water Environment (Controlled Activities) (Scotland) regulations 2005 (As Amended) Employed when considering most appropriate control regimes and associated ELV's for discharges from the site. No conflicts have been found determining the application and preparing the permit.

**7 ENVIRONMENTAL IMPACT ASSESSMENT AND COMAH**

**Guidance Notes** – The PPC Regulations require that under certain circumstances SEPA take into consideration the information in any statutory Environmental Impact Assessment carried out as part of the planning process or a Safety Report produced under the Control of Major Accident Hazards Regulations.

**How has any relevant information obtained or conclusion arrived at pursuant to Articles 5, 6 and 7 of Council Directive 85/337/EEC on the assessment of the effects certain public and private projects on the environment been taken into account? N/A**

**How has any information contained within a safety report within the meaning of Regulation 7 (safety report) of the Control of Major Accident Hazards Regulations 1999 been taken into account? N/A**

**8 DETAILS OF PERMIT**

**Do you propose placing any non standard conditions in the Permit Yes**

Permit conditions non standard	Justification
3.1 Noise	IED template condition amended to ensure a full systematic assessment of noise emissions is carried out within 3 months of permit issue and there after every 5 years
2.10 Protection of Soil and Ground Water	Conditions varied to ensure additional soil and groundwater sampling for relevant hazardous substances and reporting is carried out within 12 months of permit issue and there after every 5 and 10 years
2.7.1 Waste Acceptance	added from the old PPC Part A 5.3 template to cover waste activities under the Permit.
2.7.2 Waste types and Quantities	added from the old PPC Part A 5.3 template to cover waste activities under the Permit.
3.2 Odour conditions	added from the old PPC Part A 5.3 template to cover waste activities under the Permit.

Permit (Application) Number:

Applicant:

Do you propose making changes to existing text, tables or diagrams within the permit? NO

## 9 EMISSION LIMIT VALUES OR EQUIVALENT TECHNICAL PARAMETERS/ MEASURES

Are you are dealing with either a permit application, or a permit variation which would involve a review of existing ELVs or equivalent technical parameters? Yes

*Emission limit values Air N/A*

*Emission limit values Water*

<b>Substance:</b>	<b>ELV</b>
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	<b>Lower Limit</b>	<b>Upper Limit</b>
BOD	10 mg/l	20mg/l
Ammoniacal Nitrogen( as N)	7mg/l	8mg/l
Chloride	35mg/l	45mg/l
Suspended Solids	n/a	100mg/l
Iron	0.2mg/l	0.3mg/l
Copper	15 mg/l	25mg/l
Manganese	0.02mg/l	0.024mg/l
Chromium	0.005mg/l	0.006mg/l
Lead	n/a	0.0025mg/l
Cadmium	n/a	0.00045 mg/l

**Relevant emission benchmarks:** Water Quality Standards

**Emission point:** Leachate permeate discharge point at NGR :NJ95953 13755 into Blackdog Burn

**Rationale:** Lower and Upper limits were set by the Team Water Specialist taking into consideration the Monte Carlo Mass Balance Modelling carried out by the Environmental and Spatial Informatics unit. "The report stated with the exception of ammonia , there appears to be little concern in the discharge which will alter the concentration of parameters in the water course. "  
The plant has been run on a commissioning phase basis and the results have provided evidence that the ELV's are met with Ammoniacal Nitrogen falling well below the lower limit set.

**Details of any equivalent technical parameters adopted to supplement or replace ELVs: N/A**

**Details of any derogations from the ELVs set out in the BAT conclusions; None**

**Has an Annex been inserted to the permit containing reasons, assessment and justifications for setting the value No**

**Details of any temporary derogation for the use of emerging techniques. NB Such temporary derogations do not require PPD consultation or the insertion of reasons etc. into the permit**

Permit (Application) Number:

Applicant:

*Emission limit values Land N/A*

*Emission limit values Noise and Vibration N/A*

## 10 FINAL DETERMINATION

**Issue a Permit** – Based on the information available at the time of the determination SEPA is satisfied that

- The applicant will be the person who will have control over the operation of the installation/mobile plant,
- The applicant will ensure that the installation/mobile plant is operated so as to comply with the conditions of the Permit,
- The applicant is a fit and proper person (specified waste management activities only),
- Planning permission for the activity is in force (specified waste management activities only),
- That the operator is in a position to use all appropriate preventative measures against pollution, in particular through the application of best available techniques.
- That no significant pollution should be caused.

## 11 REFERENCES AND GUIDANCE

**Guidance Notes** – Identify key references, guidance (BREF, UK Technical Guidance, etc) used in determination

The BREF's considered were: Sector Guidance Note IPPC S5.03 – February 2007 guidance for the Treatment of Landfill Leachate

IPPC H1 Horizontal Guidance Note, Environmental Assessment and the Appraisal of BAT

Pollution Prevention guidelines Drums and intermediate bulk containers: PPG 26

IED-TG-02 SEPA Site Report Guidance

IED-TG-42 Soil and Groundwater Monitoring Technical Guidance for PPC Part A Installations

IED-PPC-TG4 A Practical Guide for PPC Part A Activities

SEPA Guidance Control of Noise at PPC Installations.

IED-PG-01-01 SEPA Application and Duly Made Guidance

IED-PG-01-04 SEPA Public Participation Consultation Guidance

IED-PG-01-08 SEPA Assessment Process Procedural Guidance

NCP-P-01 SEPA Nature Conservation Procedure for Environmental Licensing

Drums and intermediate bulk containers: PPG 26