

Guidance for Pollution Prevention

Installation, Decommissioning and Removal of Underground Storage Tanks: GPP 27

Version 1. August 2022

This guidance has been produced by the Northern Ireland Environment Agency (NIEA) and the Scottish Environment Protection Agency (SEPA). For Northern Ireland and Scotland this document provides guidance on environmental legislation. In Wales refer to Welsh Government guidance - [Groundwater protection code: underground storage tanks](#). These guidelines are not endorsed by the Environment Agency as regulatory guidance in England.

For guidance on environmental regulations in England go to www.gov.uk.
To find the relevant regulations visit www.legislation.gov.uk.

Guidance for Pollution Prevention (GPP) documents are based on relevant legislation and reflect current good practice. Following this guidance will help you manage the environmental responsibilities to prevent pollution and comply with the law.

If you cause pollution or allow it to occur, you will be committing a criminal offence. Following these guidelines will help you reduce the likelihood of a pollution incident. If one does occur contact the environmental regulator immediately on the relevant incident hotline number **0800 80 70 60**.

Contents

Section 1: Introduction	3
1.1 What is covered?	3
1.2 Legal requirements	3
Section 2: Controls on petroleum storage.....	5
Section 3: Installation, decommissioning and removal activities	5
Section 4: Planning and installation	6
4.1 Site selection	7
4.2 Tank design and materials	7
4.3 Pipework and pipework joints	7
4.4 Leak detection systems	8
4.5 Installation	8
4.6 Keeping records	9
Section 5: Decommissioning	10
5.1 Subsurface sampling.....	10
5.2 Waste management	10
Section 6: Incident response	11
References	12
Further information	15

Section 1: Introduction

1.1 What is covered?

There is a high risk of pollution during the installation, decommissioning and removal of underground storage tank (UST) systems. This pollution prevention guidance covers all USTs, including those containing:

- petroleum
- diesel
- fuel oil
- aviation fuel
- waste oil
- domestic heating oil, and
- other potentially polluting materials such as organic solvents.

For the purpose of the guidance, a UST system is any tank, associated underground pipework and ancillary equipment that is **completely or partially below ground level**.

This definition includes any tank that is:

- partially above ground but covered with earth, and
- any tank in a vault or basement where its base and sides cannot be inspected.

If it is possible to inspect all the base and walls, the tank is considered to be an **above ground storage tank** and separate guidance applies (see **Reference 2: Above Ground Oil Storage**).

For the purposes of pollution prevention, it is best to store potentially polluting substances above ground.

1.2 Legal requirements

Formal approval may be required when carrying out certain works or activities. It can take up to four months to process an application for formal approval, it is therefore important you contact the environmental regulator early on in the project.

There are laws that protect land, water, air, wildlife and people from pollution. If you cause pollution you will be committing an offence. Penalties include fines, imprisonment, Fixed Penalty Notices, stopwork notices or equivalent, and having to pay clean-up costs, along with damage to your reputation.

The Legal requirements are different throughout the United Kingdom (UK) (England, Northern Ireland, Scotland and Wales). If you are located in **Scotland** or **Northern Ireland**, you can find information on your legal environmental obligations by visiting the NetRegs website.

1.3 Pollution Prevention

It is important to understand how activities could affect the environment and cause pollution. Think about what pollution linkages there are (see Figure 1.).



Figure 1: Example of a pollution linkage using the source > pathway > receptor model. NOTE: Groundwater is both a pathway and a receptor.

The site and activities will only cause a risk to the environment or people if you have all three parts of the pollutant linkage present i.e. a source, a pathway and a receptor. You should put in place measures to prevent or minimise or mitigate the effects of any risks and thereby break the pollutant linkages between these three. By doing this, you can identify how to prevent or reduce the likelihood of pollution and reduce the impact of any risks that may occur. It is important that you fully understand the local drainage network as pollution is often caused by mistaking a surface water drain for a foul/combined sewer. Contact your local water company for advice on this.

If you cause pollution you will be responsible for the clean-up cost. This can be expensive and time consuming particularly if groundwater has become contaminated. There may be additional costs associated with recovering the cost for the environmental regulator's response (in line with the Polluter Pays Principle), you may receive fines through the criminal courts or civil claims and you may experience a reputational cost i.e. loss of future work.

Following this Guidance for Pollution Prevention will help you reduce the likelihood of an incident. However, if one does occur contact the environmental regulator immediately on the relevant Incident Hotline number. A rapid response to incidents will help to minimise the environmental impact and could reduce the overall costs.

For more information refer to **Section 6**.

Section 2: Controls on petroleum storage

Most of the UST systems in the UK are used to store petrol and diesel.

Petrol storage systems are regulated by the **Local Council Petroleum Enforcement Officer** (see **Reference 6**), which applies strict controls to installations. If petrol storage tanks are to be installed, decommissioned, or removed from a site, then you should inform the PEA before work commences.

Operators of UST systems containing flammable or explosive products must ensure that they always comply with the relevant health and safety requirements.

Comprehensive guidance on the design, construction, modification, maintenance and decommissioning of filling stations is given in a publication known as the '**Blue Book**' (see **Reference 3 and 7**). This guidance covers many aspects of design and construction and is often applicable to the underground storage of other liquids.

The Blue Book should be consulted for detailed technical information on the installation, decommissioning and removal of USTs.

This Pollution Prevention Guidance note only provides advice on those aspects that may give rise to pollution, and how to prevent this pollution. It should be read along with the Blue Book or other guidance specific to chemical storage.

If you are working with petrol, you must also liaise with the local **petroleum licensing officer**, who can provide advice on the technical requirements of your system. You can find information about Petroleum Storage Licences from the PEA, based in your local Council (See **Reference 6**).

Section 3: Installation, decommissioning and removal activities

Installing, decommissioning, and removing underground storage tanks can cause serious pollution to the water environment and to soils. A number of serious pollution incidents have occurred as a result of damage caused to UST systems during installation, inappropriate decommissioning or during the removal of systems which have not been decommissioned properly.

When you design and plan work on underground storage tank systems you must include measures to prevent pollution by maintaining the integrity of the tanks and pipework.

Reference 1 provides information on the measures to prevent pollution during the installation, decommissioning and removal of a UST system.

Section 4: Planning and installation

Appropriate choices at the design stage will reduce the risk of pollution from a UST system. Before installing a UST, you must consider:

- The suitability of the site
- The tank design and materials used to construct it and the pipework
- The contents of the tank
- The necessary measures to protect the environment.

You should also consider the option of storing in above-ground storage tanks. These are easier to install and to maintain, and any leaks or spills can be seen and dealt with quickly.

If the tanks are for the storage of petroleum, it is preferable to use underground storage tanks. Above ground storage of petroleum should only be considered after consultation with the Local Petroleum Licencing Officer.

You must consult with your environmental regulator and other appropriate bodies, such as the Local Council Petroleum Licencing Officer, before installation.

You will also need **planning permission** to install a UST system.

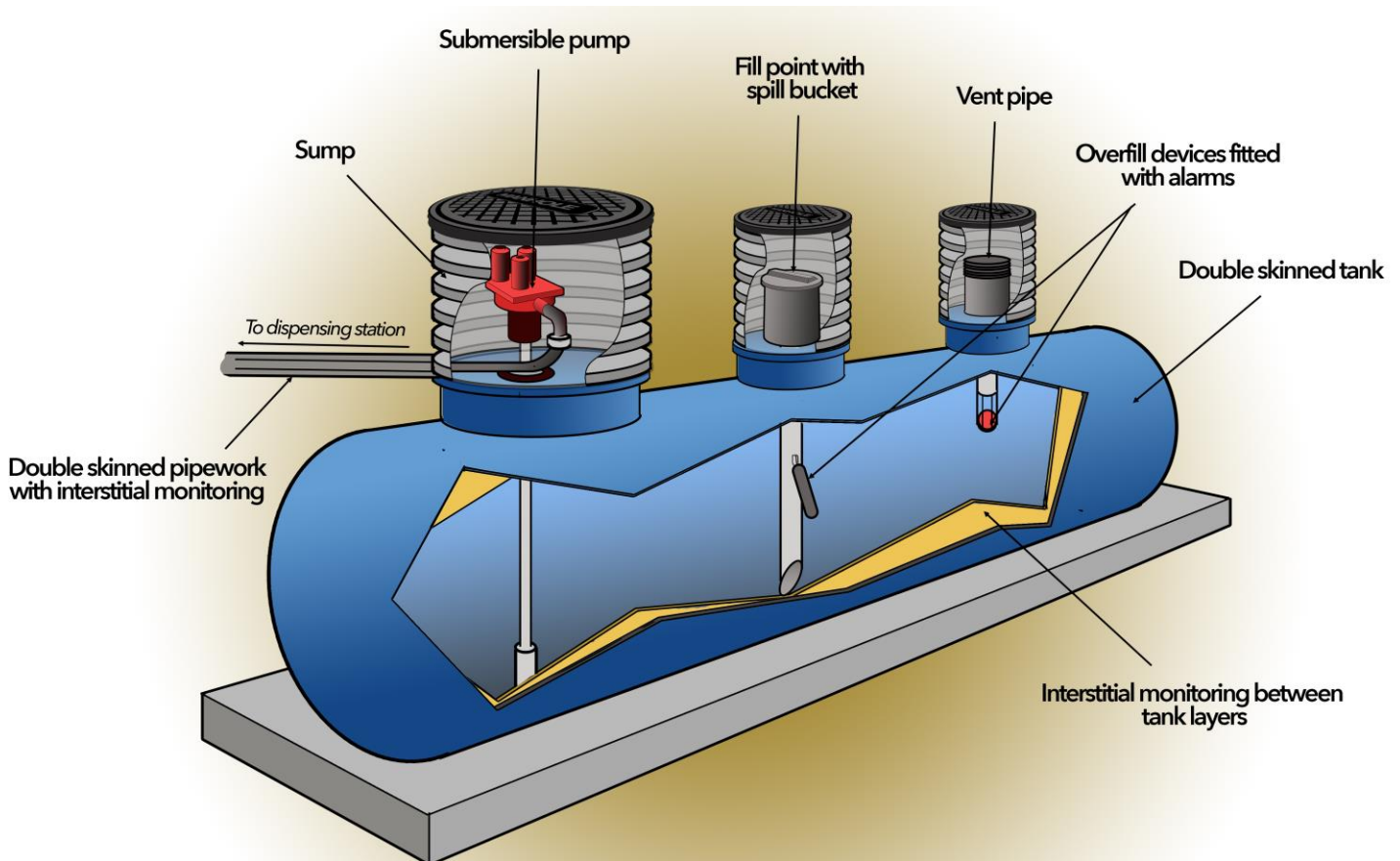


Figure 2. Diagram of an underground storage tank and the key components

4.1 Site selection

During site selection, you should consider:

- the proximity of the installation to watercourses
- the site's geology and hydrogeology
- subsurface pipes and structures
- historical site activities (including the presence of existing USTs)
- the corrosive nature of soil
- groundwater conditions such as high acidity, sulphate content or saline conditions.

The Energy Institute (see **Reference 8**) provides guidance on some of the factors to consider when siting USTs.

Where groundwater resources are sensitive or vulnerable (see **Reference 9 and 10**), your environmental regulator will seek to ensure adequate environmental controls, either through the planning process or by using notices issued under the relevant regulations.

If the risks are considered too great for a particular site, then your environmental regulator might oppose the installation.

4.2 Tank design and materials

Regardless of the product stored, all new USTs should:

- be double-skinned (that is, have an inner and outer skin)
- have an interstitial monitoring device with automatic alarms.

(See Figure 2.)

If your system is designed with these features, in the event of either skin failing the stored product is prevented from entering the surrounding subsurface. Any leak will be detected by the monitors, which will alert the operator to the problem so that it can be corrected immediately.

It is also important that the access chamber is provided with effective containment, so that any leak or spillage into this area is contained. This will prevent any pollution occurring while remedial action is arranged and implemented.

All USTs must be provided with overfill prevention (see Figure 2.).

Underground tanks are usually manufactured from glass reinforced plastic. Appropriate measures can be incorporated into tank designs to reduce risk to the environment. Steel tanks are no longer permitted

4.3 Pipework and pipework joints

Pollution incidents involving USTs are often associated with pipework and in particular failure at joints. Joints should therefore only be used where necessary. Plan where to site the tank in order to minimise the need for joints in the pipework.

The **Blue Book** (see **Reference 3 and 7**) and **Energy Institute** guidance (see **Reference 8**) describe the various types of pipework systems available and give extensive guidance on the installation of pipework systems for USTs.

Guidance provided by **OFTEC** should be followed when installing underground pipework for domestic heating oil tanks (see **Reference 11**). The most suitable type of pipework for the particular UST system should be selected.

Double-skinned pipework with interstitial monitoring protects the environment by alerting the operator to a leak before the product escapes into the surrounding soil.

Your Environmental regulator will recommend double-skinned pipework with interstitial monitoring at sites where groundwater is particularly vulnerable or where the product is distributed using a pressurised system. This allows leaks in the line to be detected quickly. If a line leak goes undetected, then the pressurised product will escape rapidly into the environment with the potential for serious pollution.

4.4 Leak detection systems

A leak detection system is vital for all UST systems. Comprehensive information on the different types of leak detection systems is given in the **Blue Book** (see **Reference 3 and 7**). You should choose a system that provides the level of protection required at the site.

The main factor in deciding the nature of the system is the vulnerability of the environmental setting. Your environmental regulator can provide information on the vulnerability of a particular site. Contact details are at the end of this document.

The chosen leak detection system must have a robust and accurate means of monitoring wetstock (fuel), with associated systems to carry out wetstock reconciliation. These systems must be managed by people who are trained to operate them effectively.

At sites where the underlying groundwater is vulnerable, you may be required to install more responsive wetstock reconciliation systems, to ensure that the groundwater resource is fully protected from potential pollution.

These systems may include statistical inventory reconciliation, which enters wetstock figures into a statistical model every day and allows small leaks of a few litres a day to be identified. As well as routine wetstock reconciliation, you should instal boreholes for groundwater monitoring around USTs in vulnerable environments. You should sample these boreholes regularly.

4.5 Installation

To ensure the system is installed as agreed with the regulatory authorities, you must arrange for an experienced person to supervise on site works. Detailed technical guidance for the installation of USTs is given in the **Blue Book** (see **Reference 3 and 7**).

It is essential that any protective coating applied to the tanks and pipework is not damaged during installation. You must inspect the coating during and after installation, and any damage must be repaired immediately and before the excavation is filled in again.

4.6 Keeping records

You must keep records of how the UST system was built for future reference during site construction work and the decommissioning or removal of the equipment.

These records must include technical drawings of the installation showing the location and orientation of the tanks and pipework, their dimensions and the materials used.

Site plans detailing the position of tanks and pipework should also include the Hazardous Area zones and tanker tracking.

It is recommended that:

- all records are dated and maintained during the life of the UST
- the records are kept on-site for future reference (for example, in the event of a leak or spillage) in a place from where they can be retrieved quickly.

Section 5: Decommissioning

USTs are decommissioned on either a permanent or a temporary basis. It is possible for tanks to be temporarily decommissioned and then forgotten about. To avoid the risk of pollution, you should remove tanks that are unlikely to be used again.

The Blue Book contains comprehensive technical guidance on the decommissioning of USTs. Although it refers to the storage of fuels, the advice is often applicable to other products stored underground. You should refer to the Blue Book (see **Reference 3 and 7**) for information about the health and safety issues associated with decommissioning USTs.

You must be particularly careful to remove and dispose of the remaining product in the tanks and pipelines. All product and tank bottoms must be removed and disposed of correctly complying with your Duty of Care for waste. (see below). Once this has been carried out, the risk of pollution is much less, as the pollution matter has been removed.

After removing any residual product from the tank and pipework you will need to make it safe by removing any explosive vapours. This can be done by filling the tank and pipework with inert gas, or with water. Any water used to remove residues from a UST will need to be removed and transported to a waste treatment facility or discharged to a foul sewer with the permission of the sewerage provider.

You must also ensure that there is no residual contamination of the site such as petrol contamination of the soil and groundwater.

Once a site has been decommissioned, the site operator should submit relevant decommissioning certification to their local Council

5.1 Subsurface sampling

Once the tank has been removed, you should take samples of soil and groundwater (if present) to check for subsurface contamination. You should have these samples analysed for the parameters appropriate to the type of product stored.

Advice on soil and groundwater sampling is available from a number of sources including the Energy institute and the British Standards Institution (see **Reference 8**: The Energy institute, **Reference 16**: BSI Water quality sampling). A qualified contractor will be able to carry out sampling to the appropriate standards.

If soil or groundwater contamination is found, you should carry out additional investigations (possibly including a risk assessment) to determine the need for remediation.

5.2 Waste management

Tanks and pipework used to store hydrocarbons or chemicals, together with residual product, wastewater, sludge and decommissioning fill may be classed as hazardous/special waste. Hazardous/special wastes must be disposed of appropriately (see **Reference 12**). Disposal of all wastes must be in accordance with the Duty of Care (see **Reference 13**).

If the tank has been used for the storage of flammable or explosive materials, then the operator must ensure that the waste disposal contractor is aware of all appropriate health and safety guidance (see **Reference 14**).

If a tank used for storing petrol is removed intact, its transport off-site will be governed by the Carriage of Dangerous Goods by Road Regulations 1996 (as amended). The HSE can advise on the measures that need to be taken (see **Reference 15**).

Section 6: Incident response

Incident Hotline Numbers:

In **Scotland, Northern Ireland and England** call:

0800 80 70 60

(24 hour service)

In **Wales** call:

0300 065 3000

(24 hour service;
Press 1 for Welsh, 2 for English)

You should immediately report any environmental incidents by calling the Incident Hotline for your country.

Incidents can include spillages (e.g. from oils and chemicals), contaminated surface water run-off, flooding, riverbed disturbance, damage to underground services, damage to habitats and poor waste disposal and storage. If in doubt, report it.

You should produce an Incident Response Plan as part of the environmental impact management of your work. Include the following:

- site risks
- list of key external and internal contacts (include your environmental regulator, Local Authority, Fire Service)
- reporting procedures
- site plan including drainage and location of storage/refuelling areas
- list of stored materials
- details of local environmental sensitivities e.g. abstractors, high amenity areas and fish farms
- location of spill equipment
- procedures for spill containment and remediation

Train your staff and contractors in the use of spill equipment and how to manage and dispose of waste materials legally.

If you are using oils and chemicals in close proximity to the water environment, store a suitable spill kit or absorbent materials nearby. Provide appropriate temporary storage for any oils and chemicals. Contain all spillages using absorbents such as sand, soil or commercially available booms or pads and notify the environmental regulator immediately, using the Incident Hotline numbers above.

References

Reference 1

SEPA: [Underground Storage Tanks for Liquid Hydrocarbons: Code of Practice for Installers, Owners and Operators of Underground Storage Tanks \(& Pipelines\)](#)

NIEA: [Groundwater leaflet](#)

NRW [Groundwater protection codes for Wales: Underground storage tanks](#)

Occupational Health and Safety Information Service: HLP 65/34: Leak Detection in Tanks and Pipework <https://products.ihis.com/Ohsis-SEO/313516.html>

Reference 2

[GPP2 Above Ground Oil Storage](#)

Reference 3

APEA: [The Blue Book: Design, construction, modification, maintenance and decommissioning of filling stations](#)

Occupational Health and Safety Information Service: [PETEL 65/34](#) . Leak Detection in Tanks and Pipework (The Occupational Health & Safety Information Service product and its related supplements are only available through online subscription)

Underground fuel tank installation [str-p5-e-e.pdf \(publishing.service.gov.uk\)](#) (EA document)

Reference 4

GPP 8: Safe storage and disposal of used oils <https://www.netregs.org.uk/media/1435/gpp-8-v3-swni.pdf>

Reference 5

GPP 19 Vehicle Service and repair <https://www.netregs.org.uk/media/1437/new-gpp-19-pdf.pdf>

Reference 6

The Local Council Petroleum Enforcement Officers

Local Council Petroleum Enforcement Officers <https://apea.org.uk/pages/contacts/petroleum-licensing-and-enforcing-authorities>

Reference 7

The Energy Institute: The Blue Book: Design, construction, modification, maintenance and decommissioning of filling stations

<https://publishing.energyinst.org/topics/petroleum-product-storage-and-distribution/filling-stations/design,-construction,-modification,-maintenance-and-decommissioning-of-filling-stations-known-as-the-blue-book>

Reference 8

The Energy Institute

The Energy Institute <https://www.energyinst.org/>

Energy Institute: Model code of safe practice - Guidance on the design, construction and operation of petroleum distribution installations

<https://publishing.energyinst.org/topics/petroleum-product-storage-and-distribution/distribution-installations/model-code-of-safe-practice-part-2-guidance-on-the-design,-construction-and-operation-of-petroleum-distribution-installations>

Reference 9

Groundwater

Northern Ireland

DAERA Groundwater <https://www.daera-ni.gov.uk/articles/groundwater>

Scotland

SEPA: Groundwater <https://www.sepa.org.uk/regulations/water/groundwater/>

Wales

NRW: Protecting groundwater <https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/advice-for-developers/protecting-groundwater/?lang=en>

Reference 10

Groundwater: Protected areas and Groundwater Source Protection Zones

Northern Ireland: Groundwater <https://www.daera-ni.gov.uk/publications/groundwater-northern-ireland>

Protected areas NI <https://www.daera-ni.gov.uk/landing-pages/protected-areas>

Scotland: Groundwater protection strategy https://www.sepa.org.uk/media/60033/policy-19_groundwaternov09.pdf

Protected areas Scotland: <https://www.sepa.org.uk/environment/water/monitoring/protected-areas/>

Wales groundwater protection <https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/advice-for-developers/protecting-groundwater/?lang=en>

Source protection zones - Wales

<http://lle.gov.wales/catalogue/item/SourceProtectionZonesSPZMerged/?lang=en>

Reference 11

OFTEC

[Domestic fuel supply pipes | OFTEC consumer guides https://www.oftec.org/consumers/off-gas-grid-heating-guides/liquid-fuel/supply-pipes](https://www.oftec.org/consumers/off-gas-grid-heating-guides/liquid-fuel/supply-pipes)

Reference 12

Hazardous/special waste

NetRegs Hazardous/special waste <https://www.netregs.org.uk/environmental-topics/waste/hazardous-special-waste/>

DAERA-NI: Hazardous Waste <https://www.daera-ni.gov.uk/articles/hazardous-waste>

SEPA: Special Waste <https://www.sepa.org.uk/regulations/waste/special-waste/>

NRW: Hazardous Waste

<https://naturalresources.wales/search?lang=en&query=hazardous%20waste>

Reference 13

Waste management: The duty of Care for Waste

Northern Ireland

NetRegs Duty of Care <https://www.netregs.org.uk/environmental-topics/waste/duty-of-care-your-waste-responsibilities/>

DAERA: Duty of Care - A code of Practice <https://www.daera-ni.gov.uk/publications/waste-management-duty-care-code-practice>

Scotland

NetRegs Duty of Care <https://www.netregs.org.uk/environmental-topics/waste/duty-of-care-your-waste-responsibilities/>

Scottish Government: Duty of Care - A code of practice

<https://www.gov.scot/publications/duty-care-code-practice/>

Wales

Natural Resource Wales: Waste duty of care for organisations

<https://naturalresources.wales/guidance-and-advice/environmental-topics/waste-management/waste-duty-of-care/?lang=en>

Reference 14

Flammable liquids

HSE: Safe use and handling of flammable liquids

<https://www.hse.gov.uk/pubns/books/hsg140.htm>

Reference 15

Carriage of Dangerous Goods

HSE Carriage of Dangerous Goods <https://www.hse.gov.uk/cdg/index.htm?lang=e>

Northern Ireland HSENI Carriage of Dangerous Goods

<https://www.hseni.gov.uk/articles/carriage-dangerous-goods>

Reference 16

British Standards Institute

BS EN ISO 5667 - Water quality. Sampling

<https://landingpage.bsigroup.com/LandingPage/Series?UPI=BS%20EN%20ISO%205667>

Further information

For information about environmental compliance, or to report inconsistencies or inaccuracies in this guidance, visit www.netregs.org.uk.

You can view guidance on environmental regulations online at www.netregs.org.uk.

This guidance is issued by the Scottish Environment Protection Agency (SEPA) and the Northern Ireland Environment Agency (NIEA).

This document is available at www.netregs.org.uk/environmental-topics/pollution-preventionguidelines-ppgs-and-replacement-series/.

First published August 2022.

Useful contacts

Incident/Pollution hotline: Northern Ireland, Scotland and England

0800 80 70 60 (24-hour service)

Emergency hotline - Wales

0300 065 3000 (24-hour service; press 1 for Welsh, 2 for English)

Floodline - Wales, Scotland and England

0845 988 1188

Flooding incident line - Northern Ireland

0300 200 0100

Natural Resources Wales

www.naturalresourcesWales.gov.uk

Head Office (Ty Cambria)
29 Newport Road
Cardiff
CF24 0TP

Tel: 0300 065 3000 (Mon – Fri,
9am– 5pm)

enquiries@naturalresourcesWales.gov.uk

Scottish Environment Protection Agency

www.sepa.org.uk

Corporate Office
Strathallan House
The Castle Business Park
Stirling
FK9 4TZ

Tel: 03000 99 66 99

www.sepa.org.uk/contact

Northern Ireland Environment Agency

www.daera-ni.gov.uk

Head Office
Klondyke Building
Cromac Avenue
Gasworks Business Park
Malone Lower
Belfast
BTZ 2JA

Tel: 0300 200 7856

nieainfo@daera-ni.gov.uk