ESA 22 - DEALING WITH SPILLS

This advice is provided and maintained by the BSIF and is intended for guidance only. The information is provided in good faith, based upon the best information currently available, but is to be relied on at the user's own risk.

Please remember that you have the responsibility to stay up to date on compliance matters and we recommend that you regularly check and review that what you do is in compliance with current legislation. If you cause pollution or allow it to occur, you may be committing a criminal offence.
Following this advice will help you manage your environmental responsibilities, prevent pollution and comply with the law. BSIF provide a series of advice documents which we believe you will find useful. These can be downloaded at www.bsif.co.uk/resources.
The advice is based on available information and legislation and its' interpretation by BSIF. BSIF will not accept any direct or indirect liability deriving from following advice or guidance. Visit www.GOV.UK for access to UK Government legislation and guidance.

Emergency Number: The Environment Agency (EA) emergency telephone number is 0800 807060. The same number should be used to contact both the Scottish Environmental Protection Agency (SEPA) and the Northern Ireland Environment Agency (NIEA).

1. INTRODUCTION

This advice applies if you're responsible for storing and transporting materials that could cause pollution if they leak or are spilt. It's good practice advice to help you identify measures to prevent, limit or reduce damage to the environment and risk to public health from a spill. This is for:

- site operators of industrial and commercial premises;
- vehicle operators;
- other organisations, authorities and businesses who store or handle polluting materials;
- sewage treatment providers.

It will also help those who respond to spills, and those responsible for transporting or storing waste from spills, to protect the environment, for example:

- the Fire and Rescue Services; (FRS)
- spill clean-up contractors;
- other bodies who may be involved in spill response, for example local authorities and public health bodies.

This advice gives information about:

- why spills must be contained quickly;
- your site's Pollution Incident Response Plan;
- the pollution control hierarchy;
- pollution control methods and equipment you could use to contain spills;
- site specific pollution control options;
- spills on a road or highway;
- clean-up after you've contained a spill, including pollutant specific information.

It doesn't cover:

- Safe and legal materials storage to help prevent spills;
- How you can prevent damage from the effects of contaminated water caused by fire fighting;
- How spills affect air quality, but following this advice may help.

Although, this advice doesn't cover public health aspects of a spill, health and safety is an important consideration. You should assess the safety risks of each incident before you take any action to contain or control a spill. We suggest you read this ESA and ESA 21 "Incident Response Planning" to help find the best way to plan what to do if you have a spill. You may need a combination of measures from different sections of this ESA.

2. KEY POINTS

You need to consider the following points to develop your spill response actions. Each point has further detail in the listed sections.

Carry out a pollution risk assessment that includes information about:	• what you store or transport; • what could happen if it's spilt; • drainage systems, water courses and protected environments on and around your site; • health and safety for pollution management.	See section 5 Completed ☐
Prepare, plan and practice your Pollution Incident Response Plan and make sure you have all the equipment you may need.		See section 6 Completed ☐
Use the pollution control hierarchy to help you plan your spill response and select suitable pollution prevention equipment.	1. Contain at source 2. Contain close to source 3. Contain on the surface 4. Contain in the drainage system 5. Contain on the watercourse.	See sections 7 and 8 Completed ☐
Consider site specific pollution control options tailored to your needs.	• containment lagoons and ponds; • sacrificial areas; • pits and trenches • spill containment tanks.	See section 9 Completed ☐
If you transport materials by road consider what you can do if you have a spill or collision.	• correct signage; • vehicle spill kits; • fuel tank and emission reduction solution spills; • tanker spills.	See section 10 Completed ☐
You're responsible for cleaning up any spilt material and the safe legal disposal of any waste from a spill. We recommend you use a UK Spill accredited contractor to help you clean up.	• check you legal obligations for waste management; • sewer jetting requirements; • highways clean up; • material specific clean up; • site remediation.	See section 11 Completed ☐

3. BACKGROUND

3.1 IMPACTS OF A SPILL

Many different materials can cause environmental harm if they're spilt and enter the environment. It's better to stop a spill happening than to have to clean up afterwards. You should consider procedures and security to protect your business and reduce the risk of a spill.

Polluting materials include things we can clearly identify as harmful, such as chemicals, pesticides, oils, sewage and animal slurries. But many things we don't see as harmful can still have a devastating effect on the environment, for example beverages, food products, detergents, dairy products, paint and ink.

Impacts can include:

- the closure of public water supplies and other abstractions, both surface water and groundwater;
- damage to wetland habitats, fisheries and river ecosystem;
- disruption of recreational and other river uses;
- groundwater contamination:
- land contamination;
- risk to and impacts on human health from air pollution.

These impacts can be immediate and long lasting, but sometimes the effect can take longer to be recognised, especially if groundwater has been polluted.

If you're the polluter, you're likely to be responsible for the clean-up costs, even where the pollution was caused by vandalism. These can be expensive, particularly if groundwater has been contaminated. There may also be additional costs associated with the local authorities and others' incident response.
The impact of a spill is affected by the:

- polluting or toxic nature of the material that's spilt;
- quantity and concentration of the material released;
- any mixing of materials released;
- environmental sensitivity of the local area around the spill;
- the time of year and weather conditions;
- availability of pollution control equipment and spill containment facilities;
- the speed and effectiveness of your incident response.
- Even small spills can have a significant impact; inappropriate or delayed action can:
- make the polluting impact worse;
- threaten public health;
- increase your clean-up costs;
- increase the risk of legal action against you.

Contingency planning is the key to stopping a spill becoming a serious pollution incident.

3.2 HOW A SPILL CAN ESCAPE FROM YOUR SITE

Pollutants can escape into the environment from your site or, where a spill happens off site, via different routes:

- Through the surface water drainage system.
- Direct run-off into a watercourse.
- Through the soil or via soakaways, drains or damaged surfaces to groundwater.
- Through unmade ground or hardstanding where there are cracks
- Through the foul sewer system, where pollutants may discharge through storm overflows to surface waters, could pass through the sewage treatment works or reduce the performance of the works so it can't treat sewage properly.
- If you have a spill that reaches a watercourse, lake, loch, lough or pond you should contact your local regulator.

Safe and legal material storage with appropriate environment management procedures is the best way to prevent a spill. You should consider both pollution preventative measures, such as installing spill control facilities, and a site specific pollution incident response plan that takes account of your activities and the materials you store and deal with, see Sections 6 and 8. The plan should include what you'll do if there's a spill from materials in transit, for example due to road traffic collisions, if you frequently travel the same route.
Your incident response plan should include the priority actions you should take. ESA 21 "Incident response planning" gives you advice on writing your plan.
If you deliver materials to other people's sites, they may have their own pollution incident response plans. You should become familiar with these in case of a spill during loading or unloading.

4. LEGAL BACKGROUND

If you do have a spill, on site or during material transit, you're responsible for its clean up and, if necessary, restoration of the environment. If you don't take responsibility, the local regulator may arrange for the work that's needed to be done and then recharge you as the polluter.
This advice may be used to supplement guidance for sites controlled under the Control of Major Accident Hazard Regulations (COMAH), the Environmental Permitting Regulations 2010 in England and Wales, or Pollution Prevention and Control Regulations in Scotland. In Northern Ireland please contact the Northern Ireland Environment Agency for guidance on the appropriate legislation that covers your site or activities and how this ESA may apply. As a condition of your environmental permit or trade effluent discharge consent, you may have a statutory obligation to have a plan and take appropriate measures to help you prevent accidents/incidents and reduce their effects. Following this advice will help you include appropriate measures for your accident prevention plan.
If your site is covered by these regulations and you don't follow this advice, you should be able to justify the reason and show that the measures you've taken are equivalent or better.

REGULATIONS WE ARE RESPONSIBLE FOR INCLUDE:

The Environmental Damage or Liability Regulations, depending on where you are in the UK, require people who operate an 'economic' activity to prevent or limit the environmental damage they cause. This includes:

- private businesses;
- farming;
- manufacturing businesses;
- construction and demolition businesses;
- waste management businesses;
- forestry operations;
- public sector – schools, hospitals and government departments or agencies;
- charitable and voluntary organisations.

These regulations require polluters to prevent serious environmental damage from their activities or to take action to remedy it. Environmental damage is considered to be:

- serious damage to surface water or groundwater;
- contamination of land where there is a significant risk to human health;
- serious damage to protected natural habitats and species or damage to Sites of Special Scientific Interest (SSSIs) in England and Wales or Areas of Special Scientific Interest (ASSIs) in Northern Ireland.

They follow the 'polluter pays' principle; if there's a risk of damage from your business activities, you must do your best to prevent the damage occurring.
In England and Wales, the Environmental Permitting Regulations, define when you must have a permit or register an exemption before you make any discharge to the water environment, surface water or groundwater. If you make a discharge without a permit, or that doesn't meet the conditions of your permit, you're committing an offence.
In Northern Ireland, the Water (NI) Order 1999 means you need a consent for discharge from NIEA before you make any discharges into the water environment.
In Scotland, discharges to the water environment are authorised through the Water Environment Controlled Activities Regulations (CAR). If you have a Pollution Prevention and Control (PPC) Permit it will contain conditions covering any discharges to the water environment that will meet the requirements of CAR.

5. YOUR POLLUTION RISK ASSESSMENT

It's always better to prevent spills happening in the first place. Safe secure storage, careful deliveries and staff training, on site and for drivers, are essential for pollution control. You are responsible for the environmental safety from your site and activities. Spills often happen when you're least expecting them.
Causes include:

- overfilling or poor handling of storage containers, for example drums, intermediate bulk containers (IBCs) and tanks;
- damaged or leaking storage containers;
- equipment and containment failure;
- failure of underground tanks or pipework;
- a collision or accident during transport or delivery;
- pipework failure;
- weather related problems, including flooding or high wind damage or extremes of temperature;
- fires or explosions;
- deliberate acts.

Before you can decide on the most appropriate facilities and equipment for your site or vehicle, you should carry out a pollution risk assessment. If you have more than one site, assess the risk for each site and for vehicle routes individually.
Your risk assessment needs to consider:

- physical, chemical and biological properties of any material that maybe spilt;
- how materials are stored or transported and the condition of storage containers;
- possible effects of accidents, flooding, vandalism and failure of containment;
- weather related problems, including flooding or high wind damage or extremes of temperature;
- location, including how close you are to local water courses, sensitive groundwater locations, public water abstraction points and environmentally sensitive areas, for example Sites of Special Scientific Interest;
- surface water drains and foul sewers that flow off your site;
- any Sustainable Drainage Systems you have on your site;
- areas of unsurfaced ground;
- operations and layout of your site, or factors to look out for in road traffic collisions;
- risks posed to people and the environment and the extent of the possible damage;
- local landscape and different weather conditions and the flood risk that could be reasonably expected at and around your site.

A risk assessment can be carried out in stages:
1. identify the materials you store or handle on site and activities that may be a hazard;
2. identify and assess potential links between each hazard source, pathways and receptors;
3. assess the likelihood and magnitude of any potential harmful effects.

Once you've completed the risk assessment, prioritise the risks to focus on putting the highest risks first. Then identify the measures you need to reduce the likelihood and impact of a spill. Include these in a pollution incident response plan; more information is in section 6. We recommend you show your draft plan to the local authority and other people who may be involved in incident response as they may suggest how to improve it.

You and your staff should always assess the risk of each individual spill, before you take action, to make sure you and other people stay safe. If you do have a spill, your planned response may need to be modified during an incident. For example:

- during heavy rainfall;
- if more than one material has been spilt;
- if the incident is on a road or highway near members of the public.

If you change the materials you use or the activities you do on site, you should update your pollution risk assessment and check your priorities for high risks.

6. YOUR SITES POLLUTION INCIDENT RESPONSE PLANNING

6.1 PREPARE

A vital part of dealing with a spill is being able to quickly identify the watercourse, groundwater and drainage systems that may be affected by a spill. This should be part of your pollution risk assessment. This will help you plan what you'll do if you have a spill and identify the pollution control equipment and possible control devices you'll need and where they should be located. Drainage systems can be very complex; without preparation, valuable time can be wasted in locating outfalls and pollution control devices.

You should have a drainage plan drawn up that identifies all the surface drains, foul sewers and soakaways on your site, their direction of flow and any watercourses, lakes, lochs, loughs, ponds, groundwater or sewage treatment works they discharge to. We recommend you colour code the surface drains as blue and the foul sewers as red, both on the plan and by painting drain covers on your site. Any combined drainage systems can be identified with a red letter 'C'. This colour system is well known by emergency responders and can save valuable time if you have a spill. The plan should also show the location of any pollution control devices and stores of pollution control equipment. This can form part of your incident response plan.

Off-site drainage plans may be available from the highway or road authorities, local authority or your local water company.

6.2 PLAN

You should prepare an Incident Response Plan for your site. If you have more than one site you'll need a separate plan for each. Information to help you prepare your plan is available in 'Incident Response Planning" ESA 21. This ESA also includes a template to help you put your plan together.

Consider showing the draft plan to your local regulator, your local Fire Rescue Service (FRS), your local authority and the local sewerage provider. They may be able to give you advice about who and when to notify about a spill, for example the size of spill for different materials, or when you should call the FRS.

Your plan should include:

- contact details for someone from your business if there's an incident 'out of hours';
- how you will clean up after a spill;
- how you will legally and safely remove residues from the spill;
- contact details for clean-up contractors.

Plans should be as simple as possible and not contain unnecessary detail. You should make sure your pollution incident response plan accounts for the safety of staff and responders.

We recommend you give the information from your plan to emergency responders so they can include it in their own response plan for your site.

6.3 PRACTICE

You should train your staff so they know:

- what they should and shouldn't do if there's a spill;
- where personal protective equipment and pollution control equipment is;
- where a copy of the Incident Response Plan is.

You should also record training carried out, listing who was trained, in what and when the training was undertaken.

They should also understand that their health and safety is more important than stopping a spill.

If you have bulk storage of materials, high hazard material storage (of any volume), frequent deliveries or regular vehicle movements that could damage storage containers, we recommend you organise practices, without an actual spill, to check your employees know what to do. Your local FRS may be interested in attending the site during a practice to help with their training and make the practice more realistic for you.

6.4 POLLUTION CONTROL EQUIPMENT

Make sure your site has stocks of pollution control equipment, suitable for your stored materials, readily available and where possible stored near possible spill sites. These could be stored as spill kits.

Pollution equipment may also be available from other sources listed below. But you shouldn't rely on these as your sole emergency equipment source as response times will vary and spilt material could cause serious pollution while you're waiting for it to arrive.

FRS often carry pollution control equipment. Some of this equipment is designed to be carried on front-line fire engines. Other more specialist equipment can be brought rapidly to the scene of an incident if required on a dedicated vehicle or environmental protection unit (EPU).

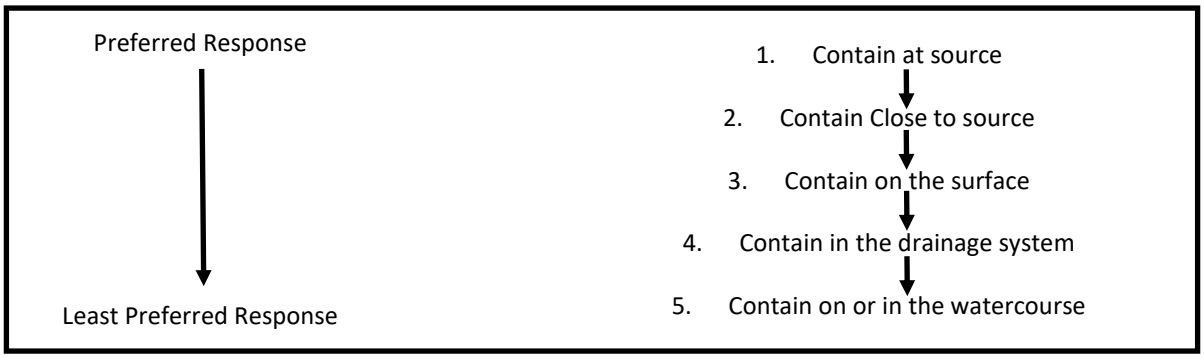
Some large chemical companies may hold stocks of suitable equipment and materials which could be brought to the scene for use by the responding company.

Many member companies of UK Spill offer an emergency response service for oil and other types of spills. We recommend you contact a UK Spill accredited contractor to help with your incident response and clean-up. Further details are available from individual companies or through UK Spill.

7. THE POLLUTION CONTROL HIERARCHY

If, despite your site management procedures, you have a spill, there are options to help you manage it. These are based around the pollution control hierarchy, figure 1. Many of the facilities, types of equipment and techniques included in the hierarchy are described in Section 8.

Figure 1. The Pollution Control hierarchy



The actions detailed in your Pollution Incident Response Plan should normally follow the pollution control hierarchy to help you reduce the impact of a spill. If you follow the hierarchy, the spill will be contained as early as possible. This reduces the quantities lost and the level of pollution caused. You may need to use several parts of the hierarchy, for example if a spill that's been leaking for some time is found. Or it may be better to skip a stage, for example by containing a spill in the drainage system instead of on the surface as it may be easier to pump the spill to safe storage and disposal from here.

If you have a spill that's flowing directly to soil or unmade ground, you should follow the first two parts of the pollution control hierarchy then look at the advice for spill clean-up and lessons learnt, section 11. If your pollution risk assessment shows that this situation could cause pollution at your site, you should consider putting an impermeable surface over the area.

8. POLLUTION CONTROL OPTIONS AND EQUIPMENT

The pollution control hierarchy gives you options for how to control a spill. These options are explained more fully below, with suggestions for pollution control equipment that may help you. These suggestions are only examples and shouldn't limit your pollution control choices. Not all examples will be appropriate for your site; you should follow the prioritised risks from your pollution risk assessment.
We suggest you ask the person who completed your risk assessment or your pollution control equipment supplier if they can suggest the best options or equipment that would work for you. Some pieces of equipment will need to be maintained or tested to make sure it's always in working order. You should refer to the manufacturer's instructions.
Your equipment should be placed near to where it may be needed, for example drain mats near to manhole covers and open drain gullies. It should be easily accessible but protected from damage and unauthorised use.

Employees should be trained how to use the equipment safely and what suitable Personal Protective Equipment they need. Their health and safety is always more important than stopping a spill.
Whatever pollution control method you use, you should clean up the material that is already spilt as soon as possible, see section 11.

8.1 CONTAIN AT SOURCE

The most effective place to stop a spill is where the spill is happening, at the source. If the primary container or secondary containment have been breached or failed for any reason, try to contain the spill where it's happening. This will reduce the quantity of material released, meaning there's less spilt material that can cause pollution.

8.1.1 SEALING THE DAMAGED CONTAINER OR PIPEWORK

This option involves physically blocking the leak and stopping any more material being spilled. This isn't a permanent fix and you will have to repair or replace the damaged container or pipework as soon as possible afterwards.

Proprietary leak sealing putty. One of the simplest ways to block a leaking container or pipe is to cover the hole with a temporary sealant. Leak sealing putty is available either ready mixed, or as a powder you mix with water. You should follow the manufacturer's instructions to apply the putty. A more permanent method may be required before you can move the damaged container.

Leak sealing equipment. This equipment is designed for when a tank, storage drum or valve has been punctured or damaged. The equipment may be a pad or clamp you fix over the damaged area like a plaster, or may be a solid or inflatable 'wedge' you can insert into the damaged area and inflate.

8.1.2 TURNING A CONTAINER

If you can, turn a small container, for example an oil drum, so that the damaged part is to the top and the material is no longer spilling from it. Secure the container so it can't roll or turn back over. This will give you time to take action to stop already spilt material spreading further and to make other plans to secure the damaged container.

8.1.3 PUTTING A LEAKING CONTAINER INTO ANOTHER SECURE CONTAINER

If possible, place a leaking primary container into a clean undamaged container to prevent any more leakage. You will need to plan for this option to make sure the second container has no contamination, so any spilt material you put into it doesn't react with its former contents, and is made from a material that won't be damaged by the leaking material and cause a bigger problem.

Overdrum. These are large plastic drums designed to safely store leaking or damaged drums, or other containers. They're made from chemically-resistant plastic, but you should check with your supplier to make sure they're suitable for the materials you have on site. Liners may be available for overdrums to make re-use easier.
An overdrum can also be used as a temporary store for a small quantity of a spilt liquid, see section 8.2

8.1.4 CLOSE ANY VALVES ON PIPEWORK TO STOP MATERIAL FLOW

Depending on where the spill is coming from, it may be possible to close valves in the pipe work to stop, or minimise, the amount of material that can be spilt.

8.2 CONTAIN CLOSE TO SOURCE

If you can't stop the spill where it's happening, aim to stop it as close to the source as possible. Where the spill has escaped from the primary and secondary containers you should try to stop it spreading.

8.2.1 TRANSFERRING THE LEAKING MATERIAL INTO AN UNDAMAGED CONTAINER

If you can safely move the material that is spilling into another container, it will limit the size of the spill. You'll need to have a suitable container and pump available, which may need to be safe for use in flammable environments. Manual pumps may be suitable for small spills but would be inefficient for moving large volumes.

8.2.2 USE SORBENT PRODUCTS TO SOAK UP THE SPILL

Sorbents are usually available as loose granules, sheets or rolls, pillows or booms. They can be used to soak up a spill and stop it spreading. There are different types of sorbent available, for example oil selective or chemically resistant sorbents. These types are described in British Standard BS 7959 Part 1: 2004. You will need to select the appropriate sorbent for the materials on your site.

Using sorbents generates waste; only use them on small spills, or where a spill has been contained to stop any further spread. All used sorbents must be disposed of according to the Duty of Care and, if soaked in oil or chemicals, may be hazardous waste or special waste in Scotland, section 11.

8.2.3 USE SMALL PORTABLE CONTAINERS TO COLLECT THE SPILL

You may be able to collect material that's spilling as it leaves the primary container or secondary containment, for example a damaged vehicle fuel tank or split pipework. Portable storage tanks are usually made from synthetic rubber, polymers or reinforced plastic and they come in a variety of sizes.

The small pack size and light weight of the tanks allows them to be easily and safely moved to the spill. Small containers, for example pop-up pools or overdrums, can safely be put on the ground where the spill is happening to stop it going any further.

8.3 CONTAIN ON THE SURFACE

If the spill is spreading and you can't safely or effectively contain it near to its source, aim to stop the material getting into the drainage system or onto any unsurfaced ground, unless your incident response plan indicates that you can use your drainage system to contain the spill. Once a spill has been contained, it's easier to remove or transfer into a suitable temporary container to stop it causing more contamination; you should do this as soon as it's safe.

If you can contain the spill on the surface, before it reaches your drainage system, you may be able to transfer it to a temporary container to stop it causing more contamination before you finish cleaning up the spill.

8.3.1 USE BOOMS TO PREVENT THE MATERIAL SPREADING

Booms can be used to divert or contain spills on hard surfaces. There are two main types:
A physical barrier boom, often made of plastic, with different sections that you'll need to fill with water; the boom can be positioned to contain a spill, isolate a drain or to divert the flow towards a specific area.

Sorbent booms that can soak up a spill and stop it flowing any further, or can be used together with a barrier boom to soak up any spill leaking from below the barrier.

8.3.2 USE DRAIN MATS TO COVER SURFACE DRAIN OPENINGS AND MANHOLE COVERS

They stop liquid flowing into the drainage system and help contain it. There are different types, including clay mats and water-filled bags. Clay mats are single-use but you may be able to have other types cleaned for re-use.

Keep drain mats close to where they might be used. Identify where liquid that is held back by a drain mat will collect as you may need to keep people away from it until it can be cleaned up.

8.3.3 USE TEMPORARY STORAGE CONTAINERS, PORTABLE TANKS

Once a spill has been contained you may be able to transfer it into a temporary storage container, where it can be held safely until it's cleaned up.

Portable tanks are usually made from synthetic rubber, polymers or reinforced plastic. They're available in a variety of sizes; some have liners you can use so the tank is easier to clean and re-use. Because the tanks are portable they can be moved to near the spill, or to where any run-off has been contained. If you're planning to use a portable tank during an incident, be aware that:

- You'll need a pump, which may need to be suitable for flammable atmospheres, in case of an oil, fuel or chemical spill.
- You should have a big enough area of ground to put the tank, near to where your spill will have been collected, which should be level and stable.
- You may need more than one person to move and position the tank.

8.4 CONTAIN IN THE DRAINAGE SYSTEM

If the spill has spread so far that it's already entered the drainage system, try to keep it there and stop it entering the environment.
If you can 'close' your drainage system, you may be able to use its capacity as a temporary containment system to hold the pollutant safely until it can be dealt with properly. In some cases, it may be possible to hose any remaining spilt material into the sealed drainage system, allowing the incident to be dealt with more quickly and safely.

Before you choose this option, make sure the spilt material won't cause an explosive atmosphere within your drainage system, unless the system is designed to control the risk of explosion.

Make sure the drainage system can be completely sealed, that it's resistant to the material spilt and can provide enough capacity to contain any possible spill; a drainage survey should help you find this information. This will allow the material to be removed safely by a registered waste carrier.

You must also be aware of what will happen to overflows from gullies and other entry or exit points to the drainage system. This will vary depending on where the drainage flows to, slopes on your site and weather conditions. Contaminated liquid may back up and discharge through storm overflows, collect in areas of your site or overflow and bypass the drainage system.

High rainfall will reduce the capacity of your drainage system and create higher volumes of contaminated water. It may cause flooding if the drains back up and that could create a hazard itself. If your pollution incident response plan includes the option to contain spills in the drainage system, consider separating your roof and yard drainage from areas where a spill is more likely to occur.

8.4.1 CLOSING OIL SEPARATORS

Oil separators are designed to contain spills of hydrocarbons and other liquids that are lighter than, and don't mix with, water. They won't contain soluble substances such as soluble oils, biofuels, emission reduction solutions, for example AdBlue, or solvents that mix with water. An oil separator won't work properly if degreasing agents or detergents can drain to, or are put into it.

Oil separators can be fitted with manual or automatic closing penstock valves at both inlet and outlet to contain larger spills. If you have a spill that has entered the drainage system, it may be possible to close the entrance to the separator to stop it becoming overwhelmed and protect it, or close the exit valve to allow the spill to collect in the separator. If your incident response planning includes using separators to contain large spills of hydrocarbons, you shouldn't use bypass separators.

Check your separator after any spill has entered the drainage system and have it emptied and maintained if needed. Oil spills may have reduced your separator capacity and other spills may affect how well your separator works. Use a specialist contractor to maintain your separator.

8.4.2 CLOSING PENSTOCK VALVES OR POLLUTION CONTROL VALVES IN YOUR DRAINAGE SYSTEM

Shut-off valves and penstocks can isolate part or the whole of a site's drainage system. They can help retain a spill on site. How effective they are depends on the capacity and condition of the drainage system. They may be operated manually on site or triggered by automatic sensors.

Generally, simple systems are best. Automatic sensors and closure devices may be used to make sure the valves close quickly on sites where an incident might not be noticed immediately. If you have an incident, it's essential to check if the valves have worked as soon as possible, either by visual inspection or telemetry.

8.4.3 PIPE BLOCKERS

If your drainage system doesn't have shut-off valves or penstocks that you can close in an emergency, or they aren't in suitable places, you may be able to seal your drainage system using pipe blockers. These can be fitted inside a pipe or gully. They're usually purpose-made bags or tubes which are inflated with air, although a builder's drain bung can also be effective.

Make sure the pressure head of the contained liquid doesn't cause the pipe blocker to fail.

Consider the health and safety of the person installing or removing a drainage blocker to make sure they aren't exposed to any hazardous conditions or materials

8.5 CONTAIN ON OR IN THE WATERCOURSE

If the spill has escaped from the drainage system into a watercourse, lake, loch, lough or pond, you may be able to limit the environmental damage by containing it on or in the watercourse before it spreads.

If the spilt material floats on water, for example oil, you may be able to put a river boom across the water.

If the spilt material mixes with water, you'll need to block the whole flow of the watercourse by damming it. This is only suitable for small watercourses.

You may also be able to put a boom across the outfall from your site.

These pollution control methods can have effects beyond containing the spilt material, for example affecting river navigation or the risk of flooding.

Only consider these options in your pollution incident response plan if you have:

- fully identified the possible effects and risks;
- pre-selected suitable places, downstream of the discharge point into the watercourse, where you can safely do this.

You must fully identify the possible effects and risks before including these options in your pollution incident response plan and ask the local regulator for advice. You must ask the local regulator and the navigation authority for advice before finalising these plans. You may also need to ask the permission of the land owner alongside the watercourse before you can plan for this option. You may also need to tell the local regulator before you boom or dam a watercourse.

When you select the booming place, you must take account of:

- Buried services, for example electricity cables or oil pipes, to make sure these won't be hit when the booms are secured.
- How fast the watercourse flows; too fast and the spilt material will wash past or under the boom.
- Variation in flows at different times of the year.
- How a tanker may gain access to the side of the watercourse to remove the collected material.

Contact the spill response company in your incident response plan to help you decide on suitable booming points as they have experience of putting booms in place.
If you've had a spill that has reached a watercourse, lake, loch, lough or pond, call the local regulator to let them know so they can give you pollution control advice. At this time, you should let them know if you have or will deploy a boom or dam the water, especially if the structure across the water will affect other users of the water. They can then warn other people or companies who use the water, for example water companies who abstract water for drinking water, that the water may have pollutants in it.

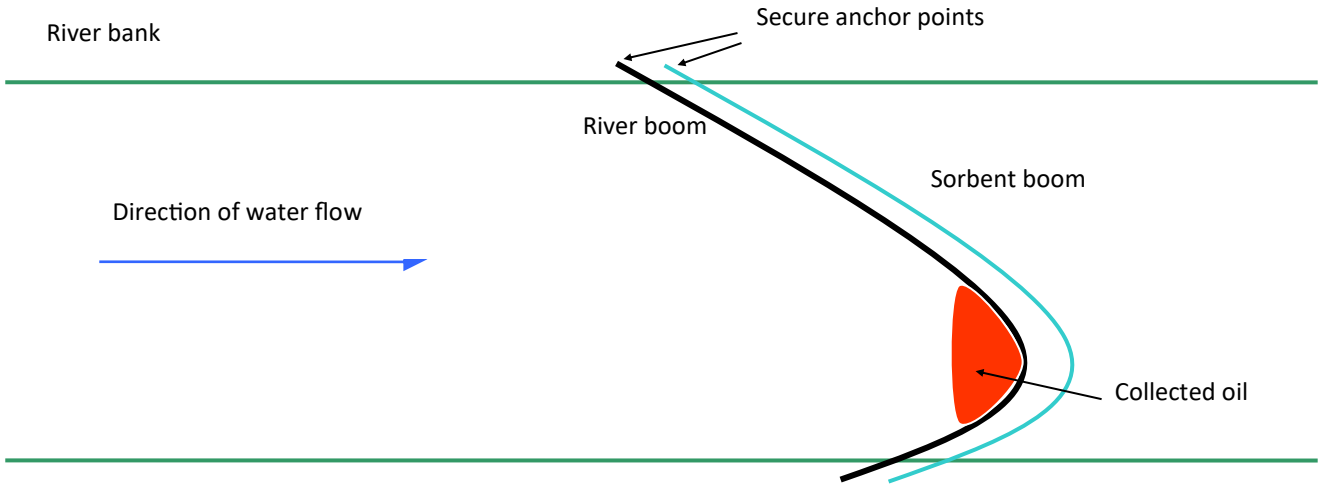
8.5.1 DEPLOY A RIVER BOOM

You may be able to use a river boom to collect oil flowing down a watercourse. A river boom is a physical barrier designed to float partly above and partly below the water surface. They can be solid but buoyant booms that piece together to the length you need, or inflatable booms you cut to the length you need, with two or more compartments; the lower one(s) to fill with water and a higher one(s) to fill with air.

Only use booms at pre-selected sites to make sure that the people putting the booms in place are safe. They should be trained how to use and secure the booms.

You may be able to put a sorbent boom downstream of the river boom to soak up any small amounts of oil that pass the river boom. This will only work with oil selective sorbent booms that float on the water's surface.
We recommend that the ends of the booms tethered to the banks are staggered, see Figure 2; this allows you to collect the spilt material in one area near to the bank so it can be removed from the watercourse, often using a vacuum tanker.

Figure 2: Boom deployment on a watercourse



If, after as much of the spill has been removed as possible, there's still a small amount left, you may be able to use oil selective sorbent booms or pads to collect extra spilt material. We don't recommend using loose granular sorbents on a watercourse unless you're cleaning a reed bed.

Any used sorbents may be classed as hazardous waste or special waste in Scotland. See section 11 for information about safe and legal disposal.

8.5.2 DAM THE WATERCOURSE

If the spilt material mixes with water you can't boom the watercourse as the pollution will just flow under the boom. If it's a small watercourse and has a low flow rate, you may be able to dam it and stop the water flow which will prevent the pollution spreading.
You can use different materials to build a dam, for example sand bags, wooden planks, hay bales and soil. Keep these securely near your planned damming point and train people how to dam the watercourse.

If your incident response plan includes the option to dam a watercourse, you must also include plans to have the contaminated water removed as quickly as possible. Water will quickly collect behind the dam and could flood other people's property and/or wildlife habitats with polluted water. You're responsible for making sure this doesn't happen.
You'll need an alternative response plan in case high flow or rainfall makes damming impractical.

8.6 IMPROVISED EQUIPMENT

If you have a spill and pollution control equipment isn't readily available, you may be able to contain it using materials already on your site like:

- salvage sheets or tarpaulin and wooden planks to create a temporary boom in a river;
- fire hoses used as a boom;
- straw bales used as a boom and sorbent;
- a shovel to spread sand or earth onto small spillages or to construct a dam;
- a car foot well mat or a sheet of polythene, weighed down with sand or earth as a drain seal.

SAND AND SAND BAGS

If you have no other sorbent products available, dry sand or earth may soak up a spill of oil or chemicals. Sand bags can be used to channel substances to a collection point, to block off drains, contain spills or to dam ditches. Once contaminated, sand and sand bags should be properly disposed of and not washed into drainage systems.

9. SITE SPECIFIC POLLUTION CONTROL OPTIONS

Your site pollution risk assessment may identify that you need or can use site specific pollution control systems. These can include on-site structures that you can divert or pump a spill to, to contain the pollution. The person who completed your risk assessment should be able to give you advice on the suitability of different options.

All these options are only short term containment measures and you should plan to remove contained material as soon as possible to prevent further risk to the environment.

9.1 CONTAINMENT LAGOONS AND PONDS

Where the size and slopes of your site and the ground and soil conditions are suitable, earth banked containment lagoons can provide cost effective, remote containment systems. You may also be able to use them to contain and re-use firewater run-off. Lagoons or ponds may be constructed above or below the surrounding ground level depending on the most cost effective option for your site.

To protect groundwater, the lagoon or pond must be impermeable. This may mean you need to put an impermeable liner into the lagoon or pond as it's built to make sure it doesn't leak. Where a liner isn't needed, we recommend a minimum of 1 metre of engineered clay, with a maximum permeability of $1x10^{-9}$ m/sec to line the area.

Lagoons and ponds should be built so they can be isolated from the main drainage system in an emergency. Flood defence installations, such as a balancing lagoon or shared, off-site flood storage facilities may be used to contain a spillage, providing that they incorporate shut-off devices, unless a flood is happening or expected. If pumped storage or transfer facilities are in use, a back-up power supply should be considered.

9.2 TANKS

You may be able to use purpose-built tanks to temporarily contain a spill. Although most tanks aren't designed specifically for this use, the UK standards for liquid storage tanks and vessels are high and many of these are suitable for use as containment. They may be more expensive than lagoons, but this can be offset by the smaller land area required. A tank may also allow fire-water to be contained and re-used in some circumstances.

The actual type, size, design standards and protective finishes of the tank will be influenced by how high the risk your site poses to the environment, the retention time, the quantity and the nature of the materials stored. A more economical option might be to use a redundant or spare tank. If you're considering this, make sure the tank has been cleaned so that any spilt material you put into it doesn't react with its former contents.

Make sure any tank you use remains fit for purpose and doesn't leak. The tank will need to be protected from corrosion and aggressive conditions. This may be provided by a range of coatings, including bitumastic paints, epoxy coatings and rubber and glass linings. These will be determined by the substance to be contained, as well as other corrosive influences. You should inspect your tanks regularly and may need to have them tested. If an inspection or test highlighted that the tank needs to be repaired, you should do this as soon as possible.

When you design a tank system for pollution control, consider the worst possible case scenario: total containment failure of your largest storage container or tank at the same time as heavy rainfall.

In some emergencies, it may be possible to use storm tanks in the sewerage system, at a sewage treatment works (STW) or at other effluent treatment facilities. You must have agreement from the sewer provider or treatment plant operator before you do this. Only use this option as a last resort and don't rely on it, as the tanks may be full, for example after heavy rainfall. The effects of the discharge on the STW should also be considered, as damage to the treatment process may result in greater environmental harm, due to the discharge of raw or partially treated sewage, as well as the contaminated run-off.

9.3 SACRIFICIAL AREAS

You may be able to allocate areas on your site as sacrificial areas. These are areas that under normal circumstances have other uses, for example car parks or hard standing, but if you have a spill you can divert or pump the spill there. The area must be impermeable to prevent spilt materials causing groundwater contamination.

Bunding car parks and other hard standing areas - Impermeable yards, roads and parking areas can be converted to temporary lagoons using sandbags, suitably excavated soil or sand from emergency stockpiles to form perimeter bunds, but only if the surface has been maintained and is in good condition. Permanently installed bunding, for example with low kerbs or roll-over bunds, around suitable impermeable areas, the entire site, or just the sensitive area, is a better option.

If you have a spill, all drain inlets, such as gullies, within the area, must be sealed to prevent the pollutant escaping. See Section 8.3 for information about containing spills on the surface. If appropriate, a liner may be used to improve the impermeability of the sacrificial area to protect groundwater.
You may be able to combine a sacrificial area with containing a spill in your drainage system to contain a larger volume of liquid that your drainage system can hold.

9.4 PITS AND TRENCHES

You may be able to use pits or trenches when other pollution control methods have failed or no other method is available. You should consider their use carefully due to the risk of groundwater contamination; ask us for advice when you're planning for this option. Use a liner to protect against land and groundwater contamination; this is essential in areas of high groundwater vulnerability. You should ensure the liner will remain undamaged by the material spilt. If you don't use a liner the contaminated ground will need to be removed and legally disposed of as soon as it's safe to do so.

Pits and trenches may be used to add reagents for neutralising harmful substances or other clean up products (see section 11.4.2).

10. SPILLS ON A ROAD OR HIGHWAY

It's more difficult to write an incident response plan for a spill on a road or highway as you can't predict where it may happen and you're less likely to know about the local environment or any existing pollution control options.
If your drivers follow specific routes, you can find out about environmentally sensitive areas and local drainage systems on those routes. You may be able to agree pollution incident response plans with the FRS, the local authority or highway or road authority. A plan can give you information about who to contact if you have a collision or a spill and the potential size of a spill. It should also address incident response and clean-up or remediation responsibilities, as any delay in incident response can make an incident harder and more expensive to deal with.

Even if you can't write a pollution incident response plan, you can still take measures to minimise the environmental and public health effects of a spill.

10.1 CORRECT SIGNAGE

Vehicles must have the correct signage and appropriate documents. For example a 'Hazard Warning Panel', for bulk or tank transportation, with the UN Number (United Nations' Globally Harmonised System of classification and labelling of chemicals) of the substance being carried, an emergency action code (Great Britain and Northern Ireland) or Hazard Information Number and in some circumstances an emergency phone number. Plain orange plates may be displayed on vehicles carrying dangerous goods in packages or intermediate bulk containers (IBCs). You may also need to display the Environmentally Hazardous Substance mark. Depending on what you're transporting this will be a legal requirement under the Carriage of Dangerous Goods Regulations or ADR.

You should consider using the Road Tankers and Tank Containers 'Black and White Marking Scheme' for substances that aren't classified as dangerous under the UN Number classification system, but that will pollute the environment, for example beverages, food or detergents. This scheme follows the principles of the Hazard Warning Panel in identifying an emergency action code and specialist advice phone number to allow prompt action from emergency responders. The Black and White marking scheme only applies in the UK and these panels should be removed before travelling internationally.
Correct signage, and documentation in the vehicle, enables emergency responders to respond quickly and appropriately when they arrive at a spill or collision; they can identify the material being carried so they can protect their own and the public's health and safety and also protect the environment.

10.2 VEHICLE SPILL KITS AND TRAINING

We recommend that all vehicles transporting goods carry a spill kit and personal protective equipment appropriate to the goods being transported. Depending on what you're transporting, carrying some pollution control equipment will be a legal requirement. This may sometimes mean a vehicle needs a dual purpose spill kit for the material being carried and the contents of the fuel tank.

Drivers should be trained how to use the spill kit safely and effectively, and when they should call the emergency services and highway or road authorities. ADR training requirements and 'instructions in writing' covers this subject. Drivers should know the most appropriate action to contain a spill and protect the environment. This should follow the pollution control hierarchy as detailed in section 7. They should be able to recognise signs by the highway that show where pollution control devices may be available so they can highlight these to emergency responders when they arrive and save valuable time.

10.3 EMERGENCY RESPONDERS

The FRS carry some pollution control equipment and, as primary responders, are able to respond to an incident quickly. As they usually arrive at an incident before many other services, they may be able to help contain a spill using pollution control equipment they carry or by operating pollution control devices.

Some highway or road authority contractors also carry pollution control equipment but their response time may not be as fast as the emergency services. If you have a spill that's spreading, contact the highway or road authority, or their local representatives, as they may have plans of the local drainage systems that could help contain a spill. They can also manage traffic around the incident and make sure the road is safe to use after the spill is cleaned up.

10.3 EMERGENCY RESPONDERS

If you have an accident or road traffic collision that causes the vehicle fuel tank to leak, take care in case the leaking fuel produces flammable vapours. If it's safe to do so, use your vehicle spill kit to stop the spill from spreading.

If your diesel vehicle has an emission reduction solution tank, for example for AdBlue, to reduce your greenhouse gas emissions, check it isn't leaking after any collision. If it's leaking, try to stop the spill spreading. This solution is a mixture of urea and water; it's highly toxic to river life and can cause extensive groundwater pollution.

10.5 SPILL FROM A TANKER

If a tanker transporting material is damaged in transit, by collision with another vehicle or if something hits it, and starts to leak, the driver should stop the vehicle. If it's safe to do so, they should use their vehicle spill kit to try and contain the spill. It may then be possible to transfer the remaining product into another undamaged tanker.

11. SPILL CLEAN UP

After you've stopped a spill getting any worse and contained the material, you should clean it up as soon as possible to prevent further risk to the environment and people. A spill contractor may be able to help with this. We recommend that mechanical recovery is used to remove as much of the collected material as possible before you use sorbents. These methods don't add to any pollution that's already been caused and create as little waste as possible.

It's important that the spilt material, or any residue after its removal, can't continue to cause pollution. You may need to employ specialist companies to help you determine if there is still a pollution risk and to clean up.

We recommend you contact UK Spill to find a reputable company to help you.

It isn't the responsibility of the FRS to make sure the waste from the spill is kept safely until it can be legally disposed of. Your Incident Response Plan should include details of who will look after your site after the spill has been made safe until the clean-up is finished.

Any material that you've collected in pools, tanks, sacrificial areas or that's being held in place with a boom must be transferred to a safe container or removed as safely and quickly as possible. After the collected material has been removed, check to see if the spill caused land or groundwater contamination, see section 11.5.

If you've used any re-usable equipment to contain the spill, for example containment tanks, it should be emptied and cleaned as soon as possible so it's ready to use again.

Any contaminated sorbents, soil or sand must be disposed of in accordance with the Duty of Care, see below.

11.1 WASTE MANAGEMENT AND YOUR LEGAL DUTY OF CARE

Waste material from an incident will come under the Duty of Care from the Environmental Protection Act 1990. This means you have a legal duty to make sure that any waste the incident produces:

- doesn't escape your control;
- is transferred only to a registered waste carrier, someone registered as exempt or to an authorised site operator if you transport your own waste
- is covered by a waste transfer note, with a full description of what the waste is when you transfer it to someone else;
- is disposed of lawfully.

If it is hazardous waste or special waste in Scotland, for example waste oil, acids and/or solvents or sorbents and soil contaminated with these, additional requirements will apply.

In England and Wales hazardous waste can't be moved without a consignment note, unless the waste is from:
• An 'emergency or grave danger' as defined in regulation 61 of the Hazardous Waste Regulations; an emergency or grave danger does not include simply unforeseen circumstances, for example, where there is no immediate threat of release of hazardous waste.

In Northern Ireland you must complete a consignment note for the movement of all hazardous waste. But in an 'emergency or grave danger', as defined in part 1 of the Hazardous Waste Regulations (Northern Ireland) 2005, the waste can be moved

In Scotland consignment notes are always required when moving special waste, but in an emergency situation the waste may be transferred before the consignment note is submitted, provided the consignment note is completed and submitted to SEPA as soon as possible after the waste is moved.

You need to keep records of waste movement for a statutory period of two years for transfer notes or three years for consignment notes. The legislation for non-hazardous waste in Northern Ireland is slightly different and you should seek local advice.

In some cases you may be able to dispose of waste to the foul sewer at a controlled rate. If you're considering this, you must first have permission from both the local regulator and the local sewer provider.

11.2 SEWER JETTING

Where pollution has entered sewers or drainage systems, these may need to be jetted to remove residues. You must consult the local sewer provider if public sewers are involved. All effluent generated by this process must be contained and disposed of by a registered waste contractor.

11.3 ROAD AND HIGHWAY CLEAN-UP

If the spill has been on a road or highway, there may be other clean-up considerations beyond removal of waste. To make sure other road users are safe, the surface must be left in a sound condition and mustn't be slippery; the highway or road authorities decide if a road is safe.

Some vehicle fuels, for example diesel, or chemicals may damage the road surface. The highway or road authority may decide you need to employ or pay for a contractor to remove part of the roadway and re-lay a new surface.

11.4 MATERIAL SPECIFIC CLEAN-UP

If you have bulk storage or regular deliveries of particularly harmful materials, for example oil or strong acids or alkalis, you could consider incident response plans specific to that material.

Your first response to a spill should be to follow the pollution control hierarchy taking actions detailed in your Incident Response Plan. But after you've contained a spill then removed as much of it and any contaminated soil or surfaces as possible, there may be additional actions where a more rigorous clean-up is needed.

11.4.1 RESIDUE CLEAN-UP

If you need to clean residues left from a spill, products exist that are designed and manufactured to clean up in different ways. These include dispersants, surface cleaners and bioremediation products. To use some of these products, you have to add them directly into the water environment. Often the products are pollutants on their own and can cause a worse problem if they aren't used correctly and for the right purpose.

You should carefully select an appropriate product for your spill and where you want to use it. If you use a clean-up product on your site or on a road or highway, you must contain all the effluents that are produced for correct disposal, see section 11.1. You shouldn't allow any effluent to be washed into, or run into, drains.

11.4.2 NEUTRALISING AGENTS

You may be able to safely neutralise some substances after they've been contained, for example soda ash may be used for dealing with acid spillages. You'll need to consider your options case by case, with expert advice. For example this will depend on the volumes that have been spilt and contained and where the spill is contained. You'll need permission from the local authority before you can use these agents to make sure they don't cause further environmental damage.

11.4.3 ANIMAL CARCASS REMOVAL

If any fish or animals were killed during a spill from your site or vehicle, you'll be responsible for their safe and legal movement and disposal. A spill clean-up contractor may be able to help you remove them.

Make sure the dead fish or animals are collected and transported in leak-proof, closed containers or sealed new packaging. If the fish or animals were 'wild', you must follow the Duty of Care for their removal, see section 11.1.

If the animals were being farmed and were killed during the spill incident, then animal by- products rules apply. See the government on-line business advice and support service for information.

11.5 SITE REMEDIATION

After any spill or pollution incident, you should assess the damage that's been done and take any necessary action to restore the environment. Your insurance company should be able to help you do this. If you're in any doubt about what you need to do, contact your local regulator.

Depending on what was spilt, how hazardous it is and local conditions, you may need an experienced consultant to help you investigate if any land contamination or groundwater pollution has been caused and to set up appropriate monitoring. If there is contamination or pollution, they can recommend options to restore it.

Restoration of either land or groundwater is a specialised process and you'll need to employ a competent company to do this. If you don't take action to restore the environment, the local regulator may take enforcement action or, in England and Wales, issue a sanction to make sure restoration is completed.

12. SITE REVIEW AND LESSONS LEARNT

After any spill or incident, you should review what happened. The aim is to find what happened so you can stop it from happening again, not to hold someone responsible.
The review should identify what went well and what could be improved. Include all your staff who responded to the spill. We suggest you invite people from outside your company who also responded to help in the review.
You should investigate:

- what happened;
- how did it happen;
- how well did you respond;
- how well did you follow your Incident Response Plan;
- did the plan work, what went well and what didn't;
- what was the overall impact of the spill, both to the environment and costs to your business?

You may need to:

- Review and improve management procedures to make sure whatever caused the spill can't happen again;
- review staff training for management procedures and incident response;
- update your pollution Incident Response Plan if something didn't work or could be improved.

You may be able to safely neutralise some substances after they've been contained, for example soda ash may be used for dealing with acid spillages. You'll need to consider your options case by case, with expert advice. For example this will depend