

Pollution Prevention Technical Information note

Airfield management

April 2011

This note gives you pollution prevention advice for the activities and processes that occur at airfields in England and Wales.

Where legal requirements are included we have stated what you 'must' do.

We are responsible for enforcing the Environmental Damage Regulations. These follow the 'polluter pays' principle and require you, as an airfield owner or manager, to prevent or limit the environmental damage your activities cause. If there's a risk of damage from your business activities, you must do your best to prevent the damage occurring.

The cost to a business of a pollution incident is around £20 – 30k. This includes clean-up, remediation and fines. But doesn't account for loss of reputation and business.

1. Introduction

In many respects, airfields can be viewed as sites where a number of industrial type processes take place. As such, many of the ways you can prevent pollution are similar to those we recommend to the industrial and commercial sectors. The main differences are runway and aircraft ice prevention and removal during the winter months and the large volumes of aviation fuel used, especially at larger sites.

Chemical anti-icers or de-icers used on hard surfaces during the winter months will increase the pollutant load in the run-off. For airfields with a significant number of traffic movements, you may need effluent treatment measures such as storage and aeration of contaminated run-off.

2. Pollution prevention checklist

This is a quick reminder of the pollution prevention actions you should take to limit the pollution risk from your airfield. More information about each point is in the following sections.

- Complete a risk assessment specific to your airfield; section 3.
- Direct more polluting surface run-off to foul sewer; section 4.
- Install pollution control equipment, for example oil separators or shut-off valves, in your drainage system; section 4.
- Check you have the correct permits from us, or consents from your sewerage provider for all discharges you make; section 5.
- Make sure your oil storage meets the minimum legal requirements; section 6.
- Store and use ice prevention and removal products safely; section 7.
- Make sure your airfield services, freight handling, maintenance and car parking are all safe, whether they're done by staff or contractors; section 8.
- Dispose of sewage and effluent safely and legally; section 9.
- Fire services must make sure their training doesn't cause pollution; section 10.
- Airfield grounds maintenance must be done carefully to prevent pollution; section 11.
- Prepare for dealing with an emergency or pollution incident; section 12.

3. Risk Assessment

It's always better to prevent an environmental incident from happening in the first place. Safe secure storage, careful deliveries, correct use of products and training are essential for pollution control.

Problems can happen when:

- storage containers are badly sited, overfilled or poorly handled and maintained;
- equipment or containment fails;
- a collision or accident happens during transport or delivery;
- pipework fails;
- weather causes problems, for example flooding, high wind damage or extremes of temperature;
- you have fires or explosions;
- deliberate acts of vandalism occur.

Before deciding on the most appropriate facilities and equipment for your site, you should carry out a risk assessment. You should assess the risk for each site individually. Guidance to help you complete a risk assessment is available in 'Controlled burn' PPG 28, reference 1 or you could hire a consultant to help you complete the risk assessment.

Your risk assessment needs to consider the:

- physical and chemical properties of any material that may be spilt and their environmental hazard;
- possible effects of accidents, flooding, vandalism and containment failure;
- location, including how close you are to local watercourses, groundwater and protected environmental features, for example Sites of Special Scientific Interest;
- surface water drains and foul sewers that flow off your site;
- operations and layout of your site, operational factors that could be a risk, for example road traffic collisions;
- risks posed to people and the environment and the extent of the possible damage;
- local landscape and different weather conditions that could be reasonably expected at and around your site.

A risk assessment can be carried out in stages:

- Identify what you have and do on site that may be a hazard.
- Identify and assess potential links between the hazard sources, pathways and receptors.
- Assess the likelihood and magnitude of any potential harmful effects.

Once you've completed your risk assessment, prioritise the risks and focus on the highest risks first. Then identify the measures you need to reduce the likelihood and impact of a spill. You should include these in a pollution incident response plan, reference 2. We recommend you show your draft plan to us and other people who may be involved in incident response as we may suggest how to improve it.

4. Site drainage

Where possible, you should separate the drainage from potentially highly contaminated areas, such as runways, taxiways and aircraft stands, from areas less prone to contamination. If you have appropriate facilities you may be able to divert the 'first flush' of surface water likely to contain elevated levels of contaminants, for example the first rain after a dry spell, to the foul sewer. The receiving sewage treatment works must be designed and operated to deal with the run-off. You must have permission from the sewerage provider before you can do this.

Because large areas of impermeable surface at airfields generate large quantities of run-off, some form of flow balancing lagoon is often installed. The lagoons can help treat your airfield run-off either passively, by means settlement, or actively, for example by using aeration equipment to reduce biological oxygen demand - BOD. You should protect the lagoons from oil contamination using oil traps and removal equipment.

You should think about the potential effect pollution can have on surface waters and groundwater. Consider installing shut-off valves at key points in the drainage system to limit the spread of pollution. You should allow for the quality of the receiving water and refer to our groundwater protection policy, reference 3, when you carry out a pollution prevention assessment.

5. Discharge permits

We regulate discharges to the water environment using Environmental Permits; you must have one before you make any discharge. Permits usually contain numeric or descriptive conditions about the volume and the chemical and physical composition of the discharge. Discharges to soakaways may also require a permit. .

If your discharge goes to the public foul sewer, you must have a consent from the local sewerage provider. This may include terms and conditions about the quantity and quality of the discharge.

6. Oil storage and handling

Aviation fuel oil is stored in above or below ground storage vessels, generally in bulk. Delivery to the aircraft usually occurs either by bulk tanker, bowser or, in the case of some large airports, by hydrant systems connecting fuel storage depots sited at remote parts of the airport to stand pipes situated below ground with access via manhole chambers. These systems operate under continuous high pressure (150-170 psi) and spills or leaks during refuelling or as a result of pipeline failure can result in a significant loss of product. It's essential that you have leakage or loss detection systems incorporated in the pipelines.

6a. Above ground storage

Above ground oil storage facilities and their ancillary equipment must comply with the Control of Pollution (Oil Storage) (England) Regulations 2001 (OSR England) unless they are exempt. The minimum legal requirements for above ground oil stores in England include:

- secondary containment that can hold 110% of the primary container;
- no drainage directly from your secondary containment;
- above ground pipe work properly supported;
- ancillary equipment provisions.

There is no exemption from these regulations for storage installed before they came into force.

Even if you don't have to comply with the OSR England, meeting the requirements is good practice and will reduce your pollution risk.

Fuel storage depots should be designed, operated and maintained following the Energy Institute Codes of Safe Practice, reference 4.

Drainage from the area around your fuel storage should pass through a suitably-sized oil separator before it's discharged.

Detailed guidance is available for above ground oil storage tanks (reference 5), oil separators (reference 6) and fuelling activities (reference 7).

6b. Underground fuel storage

Underground fuel storage should be contained in double skinned storage vessels with leak detection and should be subject to a regular inspection programme. Single skinned tanks must be regularly tested for corrosion. You should follow the advice in our groundwater protection documents, reference 3, for leak detection systems and new underground tank installation requirements.

6c. Underground pipelines

Underground pipelines should, where possible, be laid in ducting which will allow you to inspect them regularly for leaks, damage or corrosion. You should also consider double walled pipelines, particularly in environmentally sensitive areas. Routine pressure (crack) testing should be part of your planned maintenance regime; this may be a legal requirement for underground pipe work attached to above ground oil storage tanks. Remote monitoring, automatic leak detection and audio/visual alarms should be considered. Underground pipelines and their storage tanks may not be acceptable in areas of high groundwater vulnerability, reference 3.

6d. Bulk storage.

At some airfields, there are sufficient quantities of dangerous substances for the COMAH regulations to apply. Such a case might be if the quantity of Kerosene in the establishment exceeds 2,500 tonnes. Any person in control of an establishment where dangerous substances are present should

ensure that they comply with the COMAH regulations if the quantities are above the qualifying thresholds (though some exemptions exist). Further information is on the [HSE website](#).

7. Ice prevention and removal

Anti-icers are used to prevent the formation of ice, and de-icers to remove ice, frost or snow from hard surfaces and aircraft.

You should provide secondary containment for all anti-icing and de-icing storage containers, including drums, intermediate bulk containers and fixed tanks. We have guidance to help you store anti-icers or de-icers safely, reference 8.

Areas where anti-icers and de-icers are applied should be isolated from the surface water drainage system. And run-off from the hard standing should be prevented from soaking into the ground where it could cause groundwater pollution. You should consider using vacuum equipment to remove excess fluid from the hardstanding around the aircraft after these have been applied as this will reduce the polluting load of the run-off that has to be treated or discharged.

We will consider details of the anti-icing and de-icing products used on your airfield and their use when you apply for Environmental Permits to discharge from your site. You should notify us of the type and quantity of de-icer used regularly, which will depend on local circumstances and may be daily, weekly or monthly. This will help us decide how much water quality monitoring we need to do around your airfield.

You should keep records of how much anti-icer and de-icer is used by any companies based at the airfield, and of any spills or accidents.

7a. Anti-icers

Anti-icers often contain substances we don't automatically recognise as harmful, for example de-sugared molasses, which will damage the environment if it's allowed to run-off into surface water drainage systems. They may also contain thickening agents to increase their effectiveness.

Some anti-icers that are used with thickening agents can accumulate on some areas of an aircraft if they aren't regularly removed. Any residues removed from the aircraft should be collected so they can't enter the airfield drainage system.

7b. De-icers

De-icers used at airfields generally aren't conventional de-icers such as granular salt because they're corrosive. Alternative materials such as glycols or calcium magnesium acetate are substituted. De-icers may also contain de-wetting and thickening agents to increase their effectiveness. The fluid concentration will be increased as the ambient temperature drops.

Many independent carriers at commercial sites will de-ice their own aircraft. This normally happens just before take-off and may involve up to 1,000 litres of solution to de-ice a large aircraft. Fluid remaining on the aircraft will normally be deposited on the runway during take off.

Most airlines have de-icing procedures and usage documentation, with the operation being carried out by company personnel or contractors.

8. Associated services

8a. Freight handling

The carriage of freight by air is increasingly common, involving the temporary storage of freight in warehouses on the periphery of airfield sites.

The risk of pollution of surface water drainage system is high especially during loading and off loading. Because some of the materials in transit can be highly polluting e.g. pesticides, it's essential that handling companies, commonly tenants, are well managed by the airport authority and are familiar with notification procedures if they have an incident that may contaminate the drainage system. Contaminated materials from a spill should be removed, where possible, to a secure storage area or licensed waste handling facility before off-site disposal.

8b. Aircraft maintenance and servicing

A wide range of chemicals and materials are used to service and maintain aircraft. Oils, chlorinated solvents and metal plating solutions are among the ones that are most likely to cause pollution. Aircraft maintenance will normally take place in covered sites or hangars. If these areas have internal drainage, it shouldn't be connected to the surface water drainage system. You should store and handle chemicals safely and make sure you have procedures in place in case of a spill or accident, see reference 2. In the event of a spill the airport authority must be informed without delay.

Routine servicing, such as lubrication, and washing is often carried out on the aircraft stand. Where possible, aircraft washing should take place in a designated area with washwater recycling facilities or discharge to the foul sewer or a sealed tank.

8c. Car parking

You will need an oil separator on the discharge from car parks and other long term vehicle parking areas if you don't have any other controls. You may need an Environmental Permit for the discharge if it drains separately from the airfield drainage. Guidance on Oil Separators is available from us, reference 5.

8d. Contractors on site

Water pollution from airfields is sometimes the result of civil engineering work being carried out on site. You should make sure that contractors are fully aware of their obligation to prevent pollution and make sure they use appropriate safeguards and working practices. A guidance note on the prevention of pollution from construction sites is available, reference 9. You may need a training programme for contractors to explain what they must do and the importance of preventing pollution.

If your aircraft fuel is delivered into the airfield by underground pipelines you should make sure these are clearly marked and that any contractors working near them know where and what they are to reduce the chance of them being damaged or disturbed. Damage to a major pipe line could cause a very serious pollution incident.

9. Effluent and sewage disposal

9a. Airfield discharges

Most major airports are connected to the public sewer system but the size and layout of terminals and other facilities may mean you need on-site pumping stations. These stations should have an alarm system to notify personnel if the pump fails or blocks so you can prevent any sewage from overflowing.

Some airfields have their own trade effluent treatment plant to deal with sewage and run-off from areas that have been isolated from the surface water drainage system. Sewage treatment plants should be designed for your site and operations, and be properly maintained, reference 5.

Where a spill from a trade effluent treatment plant could enter the surface water drainage system or underground waters, the plant must have secondary containment and may need an alarm system. Where there's a risk of damage to the treatment process from accidental spills or excess wet weather flows, you may need flow balancing systems. You must have an Environmental Permit for all discharges from sewage treatment plants and any sewer overflows or emergency discharge points.

9b. Aircraft discharges

Onboard sewage is usually collected from aircraft holding tanks by specialist vehicles. This sewage should be discharged to the foul sewerage system with the prior permission from your local sewerage provider.

You should make sure only trained staff or contractors collect the sewage. All connections during sewage removal and discharge to the sewer should be made safely so there aren't any leaks or spills.

If your airfield accepts sewage from aircraft that have used chemical toilet additives, for example Elsan, these may need to be collected for off-site disposal. The chemical additives can damage public sewage treatment works and on-site trade effluent plants. You should check with your local

sewerage provider or effluent plant manufacturer to make sure the chemicals won't damage the system.

10. Fire services

Permanently stationed fire crews will be required to carry out regular exercises that burn fuel or inflammable gas and use fire fighting foam. A designated site should be made available and drainage directed to the foul sewer or a holding tank for subsequent disposal. The location of the site should be agreed with us. You can't allow fire fighting foam from training exercises to run into surface waters or soak into the ground; follow the guidance in reference 10.

The fire service who would normally attend any incidents at the airfield should be familiar with the site's drainage system and should appreciate the pollution risks. They should be trained and equipped for pollution containment.

11. Ground maintenance

Effective weed control is required to maintain fire breaks, to clear sight lines and regulate the growth of grass around the airfield. Airfields use various control methods, for example using herbicides to reduce or remove weeds. Fertilisers may be applied to encourage the growth of selected vegetation. You must consider how these chemicals could cause pollution.

You should store pesticides following the Defra plant protection product guidance, reference 11, preferably under cover. Requirements include measures for correct storage and use to prevent spills entering drains and the provision of pollution control equipment.

Use safe methods of work. If you use herbicides near water, you must have our written permission before you apply them. This usually takes two weeks from when we receive your application. If you employ contractors to use pesticides at your airfield, make sure they're trained and certified to do so, and preferably a member of a recognised scheme such as BASIS Advanced Contractors Certification Scheme.

You should check our groundwater protection policy, reference 3, and Defra's plant protection product guidance, reference 11, before you decide to use herbicides or fertilisers.

12. Emergency procedures and dealing with incidents

Each airfield or base should have a pollution incident response plan, with procedures and pollution control equipment in place to deal with large scale pollution incidents or fires. Guidance to help you write plan is in reference 2. It should include a comprehensive site drainage and services plan, which should be accessible at all times and descriptions of the operation of isolating valves and other pollution control equipment. The names of airfield or base Environmental Advisors, contractors and other key staff should be made available to us, along with telephone numbers for use in an emergency. This information must be kept up to date. You should make sure your staff are trained and know what their responsibilities are. You should consider running practice emergencies. Detailed advice is in our guidance, reference 12.

How you deal with oil spills from refuelling depends on where your refuelling area drains to.

If your refuelling area drains to surface water drains, you should aim to contain the spill and stop it flowing into the drains using pollution control equipment. The spill can then be removed using vacuum techniques. Oil selective sorbents should be considered where the discharge passes to surface water drainage systems as emulsified oil is highly polluting and may emulsify any oil already trapped in oil separators.

If your refuelling area drains to the foul sewer, you should still aim to contain the spill as for surface water drains.

It may be possible to treat residues from an oil spill with oil clean-up products. Different clean up products are designed and manufactured to work in different ways. They include dispersants, surface cleaners and bio-remediation products. Some of these products have to be added directly

into the water environment. The products are often pollutants on their own and can cause a worse problem if they aren't used correctly and for the right purpose. Take care how you select a product for your spill and think about where you want to use it. You should always ask for our help to find the best product for your spill clean-up. Follow our oil clean-up products guidance, reference 13 to help.

Smaller scale spills or incidents can happen anywhere at an airfield, for example during freight handling or aircraft maintenance. We recommend that airport authorities and tenants have pollution control equipment, such as spill kits. These should be suitable for the products being transported or used and staff should know how to use them safely.

If fuel is delivered to your airfield by underground pipelines, you should have a plan to deal with an incident involving damage to, or failure of, this pipeline. You should show a draft of your response plan to us and the Fire and Rescue Services (FRS) as they will need to respond if you have an incident and may be able to suggest improvements. You should also make your final plan available to us, the FRS and any other responders identified in the plan e.g. local authority Emergency Planning Departments. The FRS will need supplies of pollution control equipment suitable for use with the products your pipeline carries. You may need to provide suitable equipment because an incident involving a pipeline leak could very quickly use up all the resources the FRS have available. Liaise with the FRS, us and your equipment supplier to see where this equipment would be best located, how it should be deployed and if there's any other specialist equipment you could provide.

13. References

1. Controlled burn: PPG 28
2. Pollution incident response planning: PPG 21
3. [GP3 Groundwater protection: Policy and practice](#), parts 1 – 4
4. Energy Institute Codes of Safe Practice:
Part 2: Design, construction and operation of petroleum distribution installations
Part 19: Fire precautions at petroleum refineries and bulk storage installations
5. Above Ground Oil Storage Tanks: PPG2
6. The Use and Design of Oil Separators in Surface Water Drainage Systems: PPG3
7. Fuelling Stations - Construction and Operation: PPG7
8. Safe storage and use of de-icing products
9. Working at Demolition and Construction Sites: PPG6
10. Fire and Rescue Manual, Fire Service Operations Environmental Protection, The Stationery Office at www.tsoshop.co.uk
11. Defra Code of Practice for using plant protection products, available from Defra
12. Managing fire water and major spillages: PPG18
13. Oil clean-up products and their application in England and Wales. Environment Agency

The above Pollution Prevention Guidelines (PPGs) are available free by calling our enquiry line on 08708 506 506 or from our website at www.environment-agency.gov.uk/ppg

Phone our hotline free on **0800 80 70 60** to report any pollution incidents.

We welcome any questions or comments about this guidance, or suggestions about how we could improve it. Please email us at pollution.prevention@environment-agency.gov.uk, phone us on 08708 506 506 or write to us at:

Environment Agency
99 Parkway Avenue
Sheffield
S9 4WG.

If you have any queries, call us on 08708 506 506, e-mail us at enquiries@environment-agency.gov.uk or write to the address above.