Local Government Association

Environment Agency

Flooding from groundwater

Practical advice to help you reduce the impact of flooding from groundwater



We are the Environment Agency. It's our job to make people aware of flooding from rivers and the sea, provide flood warning services and build and maintain flood defences. In some areas we can also provide flood warning services for flooding from groundwater.

This leaflet contains useful information to help you reduce the effects of flooding on you and your property.

If you live in an area that could be affected by flooding from groundwater then this guide is for you. It contains useful information to help you reduce the impact of groundwater flooding on your property

The LGA welcomes the advice provided in this information leaflet

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Flooding from groundwater

Floods can happen anywhere and at anytime.

The most common sources of flooding are:

- river flooding.
- coastal flooding.
- surface water flooding.
- reservoir flooding.
- flooding from groundwater.

This leaflet is about flooding from groundwater. For more information about other forms of flooding, please visit our website (www.environment-agency.gov.uk).

Flooding from groundwater can happen when the level of water within the rock or soil that makes up the land surface (known as the water table) rises. The level of the water table changes with the seasons due to variations in long term rainfall and water abstraction.

When the water table rises and reaches ground level, water starts to emerge on the surface and flooding can happen.

There are some key features of flooding from groundwater:

- Flooding will usually occur days or even weeks after heavy or prolonged rainfall.
- Flooding may occur for a long time, often lasting several weeks.
- The water doesn't always appear where you would expect it to (i.e. valley bottoms). It may also emerge on hillsides.
- Water may rise up through floors rather than coming in through doors.

Flooding from groundwater is most common in areas where the underlying bed rock is chalk, but it can also happen in locations with sand and gravel in the river valleys.

If you live in an area that could be affected by flooding from groundwater then this guide is for you. It contains useful information to help you reduce the impact of groundwater flooding to your property.

Are you at risk?

Mapping the risk of flooding from groundwater is complex and is currently not possible.

Lead Local Flood Authorities (LLFAs) have powers to carry out risk management activities associated with flooding from groundwater. Your LLFA is either the unitary authority or the county council for your area. LLFAs work with other organisations, including the Environment Agency, to manage this risk. If you would like further information about flooding from groundwater you should contact your Lead Local Flood Authority.

There are no flood risk maps for groundwater. If you want to find out if your property could be at risk of flooding from groundwater or may have flooded in the past you should contact your Lead Local Flood Authority. It they do not have any information on flooding from groundwater in your area you may find it helpful to contact one of the following:

- your local Environment Agency office.
- your parish or town council.
- the Highways Authority.
- any flood wardens or Flood Action Groups in your area.

If you are still unsure whether your home is at risk you may wish to carry out a flood risk assessment. To do this, you will need to contact a professional such as a consulting engineer or chartered surveyor.

Your flood warning service

The Environment Agency is responsible for providing warnings for flooding from rivers and the sea. In some areas we also provide messages about flooding from groundwater.

Our free service can send you messages by phone, email, text message or fax when a flood is expected in your area.

Floodline can also give you practical flooding advice and a Quickdial number to help you easily access information on flooding in your area.

To find out if the service is available in your area, call Floodline on 0345 988 1188 or visit our website (www.environment-agency.gov.uk).

Know your flood codes



FLOOD ALERT

What it means
Flooding is possible.
Be prepared.

What to do:

- Be prepared to act on your flood plan.
- Prepare a flood kit of essential items.
- Check pumps and any other flood protection equipment you may have.
- Keep an eye on local water levels and weather conditions. Visit the Environment Agency website (www.environment-agency.gov.uk) for flooding information.



FLOOD WARNING

What it means
Flooding is expected.
Immediate action required

What to do:

- Protect yourself, your family and help others.
- Move family, pets and valuables to a safe place.
- Keep a flood kit ready.
- If you have a pump, make sure it is working.
- Keep an eye on local water levels and weather conditions. Visit the Environment Agency website (www.environment-agency.gov.uk) for flooding information.

You need to be aware of flooding and keep an eye on the water levels and weather in your area. You can find information on our website or by listening to local news and weather forecasts.

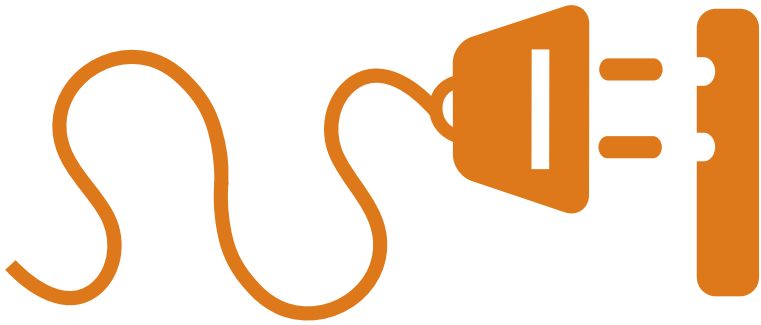
Preparing for flooding

Start preparing today before a flood happens.
Use this checklist as your flood plan.

1. **Know who to contact and how.**
   - Agree where you will go and how to contact each other
   - Check with your council if pets are allowed at evacuation centres
   - Keep a list of all your important contacts to hand.
2. **Think about what you can move now.**
   - Don't wait for a flood. Move items of personal value such as photo albums, family films and treasured mementos to a safe place.
3. **Think about what you would want to move to safety during a flood.**
   - pets
   - cars
   - furniture
   - electrical equipment
   - garden pot plants and furniture
   - what else? .....

   .....

Think about who you could ask for help and who you could offer to help – particularly vulnerable neighbours or relatives – in the event of a flood.



4. **Check your insurance cover.**
   - Check your buildings and contents insurance policy.
   - Confirm you are covered for flooding.
   - Find out if the policy replaces new for old, and if it has a limit on repairs.
   - Don't underestimate the value of your contents.
5. **Know how to turn off your gas, electricity and water mains supplies.**
   - Ask your supplier how to do this.
   - Mark taps or switches with stickers to help you remember.
6. **Prepare a flood kit of essential items and keep it handy.**
   - Copies of your home insurance documents.
   - A torch with spare batteries.
   - A wind-up or battery radio.
   - Warm, waterproof clothing and blankets.
   - A first aid kit and prescription medication.
   - Bottled water and non-perishable foods.
   - Baby food and baby care items.

You can get more information about preparing for flooding in our '*What to do before, during and after a flood*' leaflet on our website (www.environment-agency.gov.uk). You can also find more information and a template for creating your own flood plan on our website.

Protecting your property

Flooding from groundwater can affect ground floors, cellars, basements and garages.

Preventing water from entering your property

Many traditional methods of flood protection, such as sandbags, may not be effective against flooding from groundwater. This is because water can come up through the floor and remain high for a long time. Instead, you may need to consider pumping water to protect your property.

The most effective way to keep groundwater out of your property is to use a drainage or pump system to divert the water away from your home or business. However, in some cases there may be too much water and even pumping may not be effective.

Pumps work best when the inlet is installed in a sump (a low point into which water can drain). Pumping is likely to be required over many days, weeks or months.

Pumps can be electric or petrol/diesel driven. Electric pumps may be the most convenient but remember there is a chance of power cuts during a flood. You may need to consider a back up generator. Care must be taken if a mains powered electric pump is used during a flood. You should contact a qualified electrician for further advice.

Petrol or diesel pumps are possible alternatives but can be noisier and will require refuelling. This can be a problem as flooding from groundwater can often last for many weeks or even months. Position the generator outside in the open air as generators produce carbon monoxide fumes which can kill.

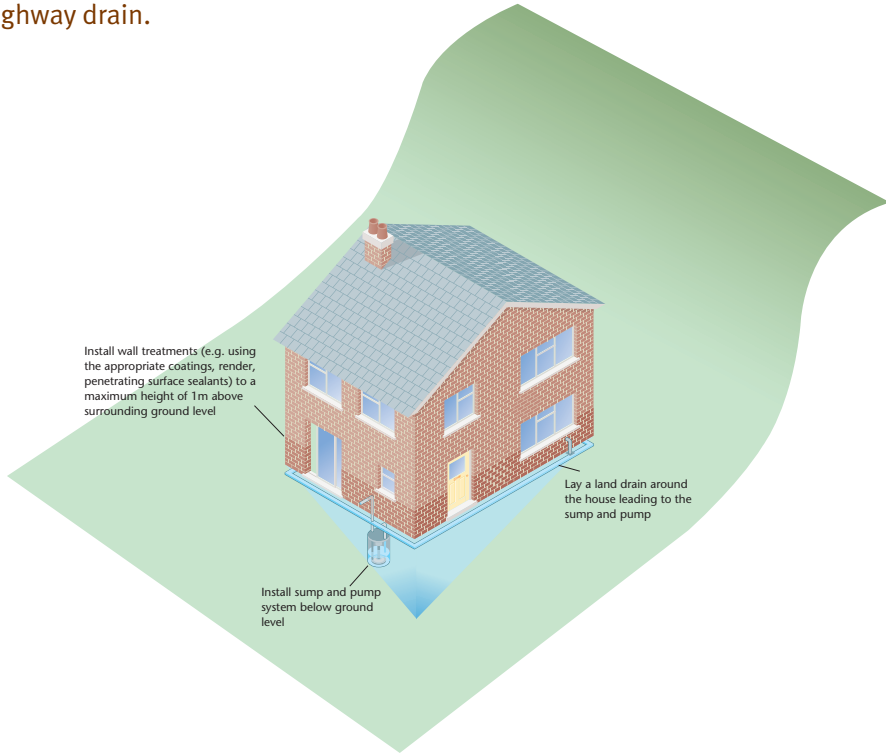
You will also need to consider where you will pump water to. Pumping from one place to another may cause flooding elsewhere. You must not pump water into the public foul sewer. Only pump out water when flood levels outside your property start to be lower than inside. This reduces the risk of structural damage. It may also be worth you contacting a structural engineer before pumping very deep water from basements.

When thinking about where you will pump water to you should contact:

- your local Environment Agency office if you are thinking about pumping water into main rivers or boreholes.
- your local authority if you are thinking about pumping water into ditches, watercourses or piped watercourses.
- the water company if you are thinking about pumping water into public surface water sewers or foul sewers.
- the Highways Authority if you are thinking about pumping water into a highway drain.

A good quality pump should last around 10 years. However, this depends on how often it is used and the acidity and dirtiness of the water.

- Regularly check and test your pump.
- Remove and thoroughly clean the pump at least once a year. Disconnect the pump from the power source before you handle or clean it.



Reducing damage to your property

Floors, lower parts of walls and openings such as airbricks are the most vulnerable parts of the property.

There are steps you can take to reduce the damage flood water causes if it does enter your property.

Floors

A replacement floor constructed to a high standard with reinforced concrete and with a continuous damp proof membrane can be an effective solution where groundwater pressures are low. Particular care must be taken where the floor and the walls join as water can penetrate through this point.

Suspended floors

Suspended floors create a void beneath the floor which will flood before water rises to enter the house. They may be constructed of timber or concrete. Flooding beneath wooden floors will often cause the timber to rot and specialist advice should be sought before carrying out this work.

Raising floor levels

If headroom is available, you could investigate raising the floor level. This can be done by either laying a new reinforced concrete floor directly onto the existing floor or by creating a new suspended floor.

It is important to remember that water exerts considerable pressure. A 300mm depth (1 foot) of water pressure will lift a 125mm thick (5 inch) concrete slab. It's this pressure that makes groundwater flooding difficult to prevent.

Basements

Basements are particularly prone to flooding and remedial measures are often difficult to implement. There are a range of 'tanking' materials available but these are best applied on the outside walls. This is often impractical and it is sometimes necessary to construct an inner wall to achieve a satisfactory result. Specialist advice is strongly recommended. Sealing the walls can lead to an increase in water pressure which may cause structural damage.

You can get more information about flood protection equipment in our

Prepare your property for flooding leaflet on our website (www.environment-agency.gov.uk).

Foul drainage

Foul sewage is the waste from sinks, baths and toilets. Foul sewage often backs up and causes problems during groundwater flooding. Foul sewerage systems fall into two categories.

1. **Main drainage systems**
   Any problems with main drainage systems should be reported to the water company or housing association who operates them. If you need further help or advice you can also contact the economic regulator of the water and sewerage industry, Ofwat (www.ofwat.gov.uk).

   If you have a continuing problem with sewage flooding which the relevant authorities are unable to solve, a range of non-return valves are available which may be able to help. You can get guidance on these from the Construction Industry Research Information Association (CIRIA).

2. **Septic tanks and cess pits**
   Septic tanks are private systems which trap solids and then discharge semi-treated fluid to soakaways or land drains. These systems frequently have problems when groundwater levels rise and it may be necessary to hire portable facilities.

   Adding a pump to the outlet side of the tank may help keep your system operational and pump the sewage to high ground above the groundwater table. You must contact the Environment Agency if you want to do this as you will need a 'consent to discharge'. The design of pumped sewerage systems is quite complex and you should always seek specialist advice.

   Cess pits are sealed tanks which store five or six week's worth of waste. If these are well built, they should not be a problem. Rising groundwater will test the integrity of the structure and small leaks may occur which will quickly fill the tank.

WARNING: it is tempting to call a tanker to empty a septic tank or cess pit when the toilet will not flush. However, if the tank has not been installed with a sufficient concrete surround then there is a risk it could float the tank or it will quickly fill with groundwater.

During a flood

In an emergency follow these simple steps to help you stay safe:

- Check on other people in your household to make sure they are safe.
- If the flood water hasn't reached you, move your car to higher ground.
- Gather essential items and put them upstairs or in a high place.
- Fill jugs and saucepans with clean water.
- Turn off gas, electricity and water supplies if safe to do so. DO NOT touch sources of electricity when standing in flood water. If you have an electric pump running you will need to leave your electricity supply on.
- Put plugs in sinks and baths to stop water entering your home. Weigh them down with a sandbag or plastic bag filled with garden soil. This is only a short-term solution. You may need to consider a longer-term solution such as non-return valves, as groundwater can be high for months.
- Keep listening to local radio updates or call Floodline on 0345 988 1188.

Stay safe. Always listen to the advice of the emergency services and evacuate when told to do so.

- If evacuated, you will be taken to an evacuation centre run by your local council. Free food and bedding is provided and most will let you bring your pets.
- Bring spare clothing, essential medication, pet food and baby care items if you have an infant.

You can get more information about what to do during flooding in our '*What to do before, during and after a flood*' leaflet from our website.

After a flood

Cleaning up after a flood

- Flood water can contain sewage and chemicals. Always wear waterproof clothing, gloves, wellington boots and a face mask.
- Make sure that your electrics and central heating are checked by qualified engineers before switching them back on.
- Clean and disinfect your property using ordinary household products.
- Use a normal garden hose to wash down surfaces.
- If you are drying your property naturally, keep windows and doors open as much as possible. If using dehumidifiers, close all windows and doors.

Insurance

- Ask your insurance company how long it will be before the loss adjuster visits.
- Photograph or film your damaged property.
- Keep copies of letters, emails and receipts as well as making a note of all phone calls.
- Flood repairs can take weeks or months to complete. Ask your insurance company if they will provide temporary accommodation.
- If you don't have insurance, your local council should be able to provide you with information on hardship grants and charities.

You can get more information about preparing for flooding in our '*What to do before, during and after a flood*' leaflet from our website.

For more information

These organisations have advice, information and services to help you after a flood.

National Flood Forum
www.floodforum.org.uk
01299 403055

The Financial Ombudsman Service
www.financial-ombudsman.org.uk
0300 123 9 123

The Construction Centre
www.theconstructioncentre.co.uk
01926 865825

The British Damage Management Association (BDMA)
www.bdma.org.uk
07000 843 236

Citizens Advice Bureau
www.adviceguide.org.uk
See local telephone directory

Construction Industry Research and Information Association (CIRIA)
www.ciria.org/flooding
020 7549 3300

Health Protection Agency
www.hpa.org.uk
01235 822 603/742

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Then call us on

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email

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or visit our website

www.environment-agency.gov.uk

incident hotline 0800 80 70 60 (24hrs)
floodline 0345 988 1188

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