Detailed guide: Cemeteries and burials: groundwater risk assessments

Updated: 1. You will need to do a risk assessment for on-going environmental management, for example grey water disposal.

2. If you dispose of water at a human burial site then you must check if you need an environmental permit for that activity.

You need to follow this guidance if you are examining the potential or current effect of burials in a cemetery or individually, as part of a risk assessment. You will need to undertake a risk assessment, for example:

- as part of a planning application or condition
- when altering existing facilities
- following a pollution incident
- when ongoing environmental management of the site is needed, for example disposal of grey water

These principles also apply to pet cemeteries and the emergency burial of animal carcasses.

You need to submit your risk assessment to the Environment Agency or your local authority, depending on who has requested it. Your assessment will need to be approved before you begin or continue your activity.

Human burials are not currently controlled through the permitting system under the Environmental Permitting (England and Wales) Regulations 2016. However, you should use the principles for a groundwater risk assessment to ensure you do not cause pollution. You may still need a permit if you dispose of any water from the site. Check the guidance Discharges to surface water and groundwater: environmental permits.

You need to check if you are in a sensitive location for groundwater and what restrictions apply. Use the interactive groundwater maps to find out if you're in a sensitive location. You must also find out about private water supplies by contacting your local council.

Read the restrictions in the Environment Agency's groundwater position statements for more information:

- section L – on the development of new cemeteries or the extension or redevelopment of existing cemeteries
- section M – for emergency disposal either on-farm or in similar locations and circumstances

Source, pathway and receptor

You should use a source-pathway-receptor approach to follow this guide's principles.

For groundwater risk assessments relating to burials the:

- source is the buried human or animal remains
- pathway is the subsoil or other medium through which substances from the source permeate and travel
- receptor is the groundwater

Groundwater receptors can include:

- any boreholes, wells and springs used for drinking supplies
- groundwater-dependent ecosystems (such as wetlands) or other identified conservation sites that may be at risk (such as a Site of Special Scientific Interest)

To assess the risk at a site you will need a realistic estimate of the yearly maximum number of burials that take place or will take place, and whether these involve human or animal remains.

You must ensure any subsurface investigation of the soil and rock is at least 1 metre below the base of the grave.

You should use site specific hydrogeological data.

Tiered approach to risk assessment

You must not pollute groundwater and you need to carry out a risk assessment to show that:

- hazardous substances have been or will be, prevented from entering groundwater
- any pollution from non-hazardous pollutants will be limited
- microbiological contaminants will not endanger water resources or supplies

You should use a tiered approach for risk assessments. The cost, time and effort in undertaking an assessment is proportional to the effort or measures required to make the risks from the activity acceptable.

For all tiers you need to develop a conceptual model.

Tier 1 risk assessment: risk screening

For a tier 1 assessment, you need to do a desk study and a qualitative risk assessment. Each risk is ranked using a scoring system to prioritise those of most concern. The overall risk of the proposal can then be assessed as low, medium or high. For high and medium risks you need to do a more detailed tier 2 or 3 risk assessment.

Tier 2 and 3 assessments: detailed risk assessments

For tier 2 and 3 assessments you need to build on the information you gathered in your tier 1 assessment and refine your conceptual model.

If your risk assessment shows pollution or a risk of pollution you need to work with your local authority and the Environment Agency on how to address this. At existing cemeteries you will have to stop burials until you have an agreed plan of action.

Tier 2 and 3 minimum risk assessment requirements

For tier 2 and 3 assessments you need to supply the following minimum information.

Site description

Your risk assessment must show for:

- tier 2, a local survey to supplement Ordnance Survey maps
- tier 3, an accurate site survey based on location, area and topography – mark any landscaping included in the proposal

Number, type and sequence of burials

Your risk assessment must show for:

- tier 2, projections on which annual numbers are based should be available with supporting data and explanation
- tier 3, use the tier 2 projections and a plan of the proposed sequence of burial area usage with indication of expected progression over time

Meteorological factors

Your risk assessment must show for:

- tier 2, long-term average data on local rainfall and Met Office Rainfall and Evaporation Calculation System (MORECS) soil moisture data
- tier 3, analysis of available data to find out the monthly mean, maximum and minimum effective rainfall, and soil moisture data for bare soil, short-rooted vegetation and deep-rooted vegetation

Soil and subsoil characteristics

Your risk assessment must show for:

- tier 2, soil survey maps, and possible site investigation and percolation tests
- tier 3, site survey with augering and trial pits

Geology (including superficial) and hydrogeology

For tier 2, you must show geological and hydrogeological maps and histories.

You may also need to include:

- limited site investigation (like trial pits and drilling)
- groundwater vulnerability
- source protection zones (SPZs)
- an assessment of the aquifer characteristics from available published data

For tier 3, you need to provide the tier 2 information, plus:

- rock and soil characteristics
- presence of shallow groundwater
- variations in water table recorded for at least 1 year of monthly measurements

Boreholes must be at least 10 metres below the minimum groundwater level. Gather data and carry out investigations (for example, to estimate permeability based on falling head test, bailing test, tracer tests).

A minimum of 3 investigation boreholes are required – 1 on the up-gradient side of the site and 2 close to the down-gradient boundary.

Monitoring

Your risk assessment must show:

- tier 2, groundwater monitoring data
- tier 3, groundwater monitoring data – off-site monitoring may be necessary

Proximity to water source or resource

Your risk assessment must show for:

- tier 2, Environment Agency records of licensed abstractions and local authority records of private water supplies (include surface and groundwater supplies)
- tier 3, as tier 2 plus any additional water features including all groundwater, drainage, flood risk and surface water features (read more about water features surveys)

The area of the water features survey will depend on the size of the site, proposed abstraction rate and the aquifer type. The Environment Agency will determine the radius of the survey.

Data assessment

Your risk assessment must show for:

- tier 2, simple pollutant flux and water balance calculations, such as dilution at the water table
- tier 3, possible use of more sophisticated models to assess attenuation

Proximity to housing or other developments

Tier 2 and 3 risk assessments must check local, regional or national planning authority for potential:

- residential, educational, commercial or industrial developments
- roads, rail and mineral extractions

Monitoring groundwater

You don’t need to monitor sites where the risk assessment shows that the risk to groundwater is low. You will need to monitor other sites, with the frequency depending on the degree of risk.

Follow the groundwater monitoring principles and the technical guidance for monitoring groundwater.

You may also need to carry out monitoring outside the burial boundary. For example, if burials are close to the perimeter of cemetery grounds.

You need to carry out monitoring to:

- define the baseline water quality and physical conditions in surrounding groundwater and surface waters before development
- identify all vulnerable receptors and help identify potential pathways
- provide an early warning of adverse environmental impacts

If monitoring identifies groundwater pollution, you must stop burials and carry out further investigations to find out the cause. You must also contact the Environment Agency who may require you to take action to sort out the pollution before burials can start again. Remember this applies to human and pet cemeteries.

Minimum monitoring requirements

You may need to consider what parameters you’re monitoring on a site-specific basis. For example, you may need to include formaldehyde, organics, hazardous substances and bacterial indicators.

Where you need to monitor groundwater, you must meet the following minimum requirements for pre-development and ongoing burials.

Minimum number of boreholes

You should have at least 1 borehole up-gradient of the boundary of the site and 2 boreholes down-gradient of the boundary of the site. The down-gradient boreholes should be spaced no more than 100 metres apart. You should work out the groundwater flow direction from your monitoring boreholes.

Minimum borehole monitoring period

You should monitor:

- 12 months before site development
- for a period of 3 years after first interment

For higher risk sites, the Environment Agency may require an increase in the frequency of monitoring, both prior to development and longer term. This will depend on the sensitivity of the site and the results of the monitoring and can be reviewed accordingly.

Surface water monitoring points

For surface waters that are at risk you should have 1 monitoring point upstream and 1 downstream. These should be monitored on a monthly basis.

Baseline conditions

The minimum frequency for monitoring of baseline conditions and the monitoring suite (the determinands) prior to development is either quarterly or 6 monthly.

Minimum frequency	Suite of determinands
Quarterly	water level, pH, temperature, electrical conductivity, dissolved oxygen, ammonium, nitrogen, chlorine
6 monthly	sulphate, total oxidised nitrogen (nitrate and nitrite), total organic carbon, biological oxygen demand, chemical oxygen demand, alkalinity, sodium, potassium, calcium, magnesium, iron, manganese, cadmium, chromium, copper, nickel, lead, zinc, phosphorus

Long-term monitoring

The frequency of monitoring and suite of determinands for long-term monitoring once the site is in use (indicators of pollution) is 6 monthly.

Minimum frequency	Suite of determinands
6 monthly	water level, pH, temperature, electrical conductivity, dissolved oxygen, total oxidised nitrogen (nitrate and nitrite), total organic carbon, biological oxygen demand, chemical oxygen demand, ammonium, sulphate, chlorine, sodium, potassium, calcium, magnesium, iron, phosphorus

You may also need to increase the frequency of monitoring for higher risk sites or decrease it to annual monitoring if monitoring shows stable conditions.

Calculate your site’s pollutant release

You can use the following information to calculate the potential release of pollutants from your site.

Composition of the human body:

Composition	% weight
Water	64
Protein	20
Carbohydrate	1
Mineral Salts	5
Fat	10

Element components:

Elemental Component	% dry weight
Carbon	80.6
Nitrogen	9.2
Calcium	5.6
Magnesium	0.1
Sodium	0.3
Potassium	0.7
Phosphorus	2.5
Sulphur	0.7
Chloride	0.3
Iron	«0.01
Heavy Metals	Trace

Rates of release

Micro-organisms are mainly responsible for the breakdown of human remains. The rate of decay depends on the extent of microbial growth and activity. The proportions of degradable matter in a human body are:

- readily degradable – 60%
- moderately degradable – 15%
- slowly degradable – 20%
- inert (non-degradable) – 5%

The slowly degradable and inert rates assume that mineral salts (ashes) form a final stable residue. The slowly degradable component of bones may be considered for practical purposes.

The rate of microbial activity is influenced by the:

- availability of nutrients (carbon, nitrogen, phosphorus, sulphur) and moisture content
- pH conditions
- climate – warm temperatures speed up decomposition
- soil characteristics – well-drained soil will speed up decomposition, whereas poorly-drained soil like peat has the reverse effect
- burial practice – depth of burial and coffin construction control the ease with which micro-organisms and other invertebrates and vertebrates may gain access

Pathogens (mainly micro-organisms such as a virus or bacteria that cause disease) may also be present. They will die off naturally and rapidly reduce in concentration with increasing distance from the grave. Physical conditions like temperature, moisture content, organic content and soil pH will also affect their survival time.

There is also the potential, depending on the natural soil characteristics, for an increased soil pH resulting from a high proportion of calcium. This may impact upon degradation rates and micro-organism activity.

Typical pollutant half-lives

A buried human body normally decays to skeleton within 10 to 20 years. Pollutants from human remains come from dissolved and gaseous organic compounds and dissolved nitrogenous forms, especially ammoniacal nitrogen.

Estimates suggest that more than half the pollutant total leaches within the first year and halves year-on-year after that. Less than 0.1% of the original pollutant total may remain after 10 years.

Potential pollutant release (kg) from a single 70kg burial

Year	Total organic carbon	Ammonium	Calcium	Magnesium	Sodium
1	6.00	0.87	0.56	0.010	0.050
2	3.00	0.44	0.28	0.005	0.025
3	1.50	0.22	0.14	0.003	0.013
10	0.01	<0.01	<0.01	<0.001	<0.001

Year	Potassium	Phosphorus	Sulphate	Chloride	Iron
1	0.070	0.250	0.210	0.048	0.020
2	0.035	0.125	0.110	0.024	0.010
3	0.018	0.063	0.054	0.012	0.005
10	<0.001	<0.001	<0.001	<0.001	<0.001

Typical infiltration rates

The time it takes to flush pollutants from the buried body relates directly to effective rainfall and the infiltration rate through the soil and grave.

Estimate the possible average composition of effluent reaching the water table beneath the burial ground by dividing the pollutant release by the total annual infiltration.

This table gives an estimate of water infiltration (litres per year) through a typical grave plot.

Surface cover	Infiltration from grass surrounds	Infiltration from surface	Total annual infiltration
Chippings	2,000	750	2,750
Grass	2,000	500	2,500

Surface cover	Infiltration from grass surrounds	Infiltration from surface	Total annual infiltration
Tress/shrubs (green burial)	2,600	250	2,850

This table is based on a mean annual rainfall of 650mm and typical evapotranspiration losses. Each grave and surrounding area is considered to be centred on:

- 5.06 metres squared for a typical municipal cemetery with a grave density of 1976 per hectare
- 6.32 metres squared for green burial sites with a grave density of 1580 per hectare

Green burial sites

Green burial sites usually have more rapid decay rates compared with conventional cemeteries because of:

- relatively shallow depth of burial
- biodegradable nature of the coffins or shrouds
- lack of embalming fluids

You will need to consider infiltration rates, and adjust your calculations accordingly when carrying out your risk assessment. Infiltration rates may be lower on such sites due to increased evapotranspiration by trees and shrubs.

You should tailor the monitoring to suit products of aerobic decay processes such as nitrate and sulphate. This is because green burials are less polluting than anaerobic decay and for example, don’t usually include formaldehyde.

Attenuation of pollutants from burial sites

Pollutants from a burial site may migrate into the:

- soil zone surrounding the burial
- unsaturated zone of the underlying aquifer
- saturated zone of the aquifer

Where there are shallow soil zones or deep graves, burials will affect the unsaturated zone directly.

Following burial the breakdown by the main processes of attenuation are summarised as:

- in the soil zone, intense chemical and biochemical degradation, filtration and sorption takes place
- in the unsaturated zone, sorption and filtration continue but there is reduced chemical and biochemical degradation
- in the saturated zone, dilution and dispersion dominate – the extent of filtration is dependent on the nature of the aquifer, and chemical

reactions dependent on the groundwater chemistry

Soils have complex content, with the potential for intense biochemical reactions, meaning contaminants may change while passing through them. Unless there is waterlogging, air access is generally good and this encourages rapid oxidation of pollutants.

Below the soil, in the unsaturated zone, less chemical and biological activity takes place. Oxygen diffusion from the surface is low and low oxygen (anoxic) conditions may develop. However, chemical and biochemical reactions may continue to attenuate pollutants. Filtration and sorption may continue to de-mobilise particulates and some dissolved pollutants.

The potential for the aquifer matrix to remove micro-organisms and pathogens by filtration depends on the nature of the matrix. Where the major route for groundwater flow is through a porous intergranular matrix, like sandstone aquifers, there is a high filtration potential.

Conversely, aquifers where fractures are the main flow route, like chalk aquifers, offer limited potential for filtration.

Transport of micro-organisms and pathogens

The transport of micro-organisms and pathogens in groundwater depends on their size, shape and their means of being transported through the aquifer.

Water abstracted from a shallow depth has a shorter travel time within the aquifer. Therefore it is more likely to be at risk of transporting micro-organisms and pathogens than water abstracted from a greater depth, which has a longer residence time.

Because of the short travel time, many springs and shallow wells are more vulnerable to microbial pollution problems than deep wells or boreholes.

Detailed guide: Cemeteries and burials: prevent groundwater pollution

Updated: Added ‘unaltered or unweathered’ to make it clear that graves must not be dug in unaltered or unweathered bedrock.

Burials must not pollute groundwater. Groundwater can be at risk of pollution from burials where the numbers are sufficient and if the site is in a sensitive or vulnerable area. Measures to prevent or limit pollution must be appropriately considered, given the sensitivity and risks posed.

The Environment Agency's groundwater position statements explain government policy on the burial of human and animal remains.

Human and animal burials: minimum groundwater protection

A burial site must be:

- outside a source protection zone 1 (SPZ1)
- at least 250 metres from any well, borehole or spring supplying water for human consumption or used in food production – for example at farm dairies
- at least 30 metres from any spring or watercourse not used for human consumption or not used in food production
- at least 10 metres from any field drain, including dry ditches

Different rules apply for:

- home burials of a person or larger domestic pet animal – the minimum distance is 50 metres from any well, borehole or spring supplying water for human consumption or used in food production purposes, including private water supplies
- home burials of domestic pets – there are no minimum groundwater protection requirements
- mass emergency burials with a risk of disease carried by groundwater – the zone may extend to source protection zone 2 (SPZ2)

All graves must:

- have at least 1 metre clearance between the base of the grave and the top of the water table – they shouldn't have any standing water in them when dug
- not be dug in unaltered or unweathered bedrock
- not be dug in areas susceptible to groundwater flooding
- be deep enough so at least 1 metre of soil will cover the top of the coffin, body or animal carcass

Always allow for any potential rise in the water table, including seasonal variations and extreme rainfall.

The Environment Agency can take action if large numbers of burials, either as a single event or over a period of time, affect or could affect groundwater quality.

Burials can result in the discharge of hazardous substances and non-hazardous pollutants to groundwater. They are therefore covered by the requirements of the Groundwater Daughter Directive 2006/118/EC as implemented by the Environmental Permitting Regulations.

The Environment Agency may serve a works notice under section 161A of the Water Resources Act 1991 and the Anti-Pollution Works Regulations 1999 to prevent or seek remedial action for pollution of controlled waters.

In addition to the requirements set out in this guide, you may need to monitor groundwater before burying animal or human remains. Find out what you need to monitor in the cemeteries and burials groundwater risk assessment guidance.

Burials below the water table

Burials must not cause pollution and therefore shouldn't take place below the water table. Burials below the water table limit the capacity for attenuation and there must be no direct input of hazardous substances to groundwater. Therefore, some sites with existing planning permission, such as existing cemeteries, may need some form of intervention to control groundwater levels. For example, artificial drainage and abstraction for removal.

You must collect any artificially drained groundwater, treat it as contaminated, and dispose of it as foul water. You'll need an environmental permit to carry out these actions unless you have permission to discharge to mains foul drainage. Contact your local sewerage provider in these cases.

Until there is more information about the effect of any new method for managing burials close to, or below, the water table, the Environment Agency will want to see:

- a hydrogeological assessment of present and future risks
- plans for continued checks of the site including long-term monitoring

For human burials, this includes the use of sealed caskets.

Disposal of ashes

You don't need permission to scatter ashes from a single cremation on your own land, or make any formal record of doing so. You should seek permission from the landowner if you want to scatter ashes on someone else's land.

If you're spreading ashes across surface water you should avoid casting wreaths or other memorabilia – they may harm the environment, including wildlife.

Crematoria owners and managers must carry out a site-specific risk assessment if ash is scattered at their sites.

Find out if you need a permit to bury or spread ash at pet cemeteries.

Human home burials

If you want to bury individual human remains at home, you must:

- fill in a burial authorisation form before the burial takes place – contact your local council for the form
- record the burial in a land burial register
- follow the minimum groundwater protection requirements

You should also make a clear, detailed plan showing where the burial took place, and keep this with the deeds of the property or land.

Green burial sites

Green burial sites are often in areas such as woodlands, nature reserves and gardens.

Site managers and owners must follow minimum groundwater protection requirements.

Contact the Natural Death Centre to find out how to arrange a green funeral.

Existing cemeteries

Manage existing cemeteries to limit environmental impact. For example, use methods such as artificial drainage to reduce the risk and meet the minimum requirements where possible.

Any extension to an existing site must comply with the requirements for new cemeteries and extensions. All existing sites should have an appropriate risk assessment.

New cemeteries and extensions

Any new cemetery or extension to an existing site, including grave plot reuse and ‘lift and deepen’ methods, must:

- comply with minimum groundwater protection requirements
- pose no unacceptable risk to groundwater used for drinking water and food production purposes

As a minimum you must do a tier 1 risk assessment to evaluate the potential harm to groundwater from pollution.

Local councils control new cemetery and extension applications through planning laws, and the Environment Agency is a statutory consultee for potential groundwater pollution.

The Town and Country Planning Act and Regulations (various dates) have provisions allowing the control of development and land use, including cemeteries. Planning conditions may be set to protect groundwater.

The Environment Agency considers sites with the potential for 100 burials a year or more to be high risk. These sites will need detailed evidence to show both:

- sufficient depth to the water table or that natural formations offer protection
- proposed engineering and management methods to prevent unacceptable groundwater pollution

You may also have to carry out regular monitoring to ensure the risk of groundwater pollution stays acceptable. How often, and what checks, depends on:

- cemetery size and rates of use
- results of the risk assessment
- hydrogeological characteristics
- ongoing results of the monitoring

The Environment Agency expects you to limit your cemetery's environmental impact, such as phasing burials to reduce the concentration of substances and organisms.

Arrangements for human burials in emergencies

During an emergency situation, such as a health epidemic or disaster, it's a priority to keep sources of drinking water safe from contamination.

Emergency planners should always try to use alternatives to burial for body disposal, such as cremation. Plans for using existing cemeteries, or land reserved for new cemeteries, must not affect the quality or safety of groundwater or any other water supplies.

Any temporary morgue or mortuary must be able to contain bodily fluids, microbes, substances and chemicals. This may involve sealing drains for safe collection of liquids for later removal by a specialist contractor.

During such emergency situations, if groundwater is at risk, then the minimum groundwater protection requirement of being outside an SPZ1 may be extended to SPZ2.

Animal burials

Different rules apply for:

- domestic pets
- pet cemeteries
- livestock and wild game

If you're burying wild animals (except wild game) you must follow the minimum groundwater protection requirements.

Domestic pets

You don't need permission to bury domestic pets.

You can bury small domestic pet animals such as a dog or a cat on your own land, for example in your back garden. There are no minimum groundwater protection requirements.

If you want to bury a larger pet animal such as a pet horse follow the minimum groundwater protection requirements.

For these larger pet burials contact your local council's animal health office. Your local council may ask for a map marking the burial place or they may have additional requirements .

Pet cemeteries

Owners and managers of pet cemeteries should comply with:

- minimum groundwater protection requirements
- the Animal By-products (Enforcement) (England) Regulations 2013
- the voluntary code of practice of the Association of Private Pet Cemeteries and Crematoria

You must also register your pet cemetery with the Animal and Plant Health Authority. Find out where you can build pet cemeteries and how to register them.

Livestock and wild game

You must not bury on-site any animal kept as livestock or that's wild game. This includes animals at farms, zoos and similar places. You can dispose of them by:

- commercial incineration and rendering
- landfill – the site must have the correct environmental permit for animal carcasses

Under normal circumstances, the burial of fallen stock is prohibited by the Animal By-products (Enforcement) (England) Regulations 2013. A relaxation from this rule (a 'derogation') applies in the Isles of Scilly.

Find out the rules on burying or burning fallen stock so you can safely dispose of dead animals.

Animal burials in emergencies

The government may relax the laws preventing on-site burials of animals kept as livestock and wild game during extreme events. For example, during a widespread outbreak of foot and mouth disease. You must consider the risk to groundwater – the minimum groundwater protection measures still apply.

Emergency conditions and time pressures mean only quick, simple risk assessments are possible. This limits burial permissions. Farm managers must have no other means available for disposal before considering burial.

Animal burials: pollution risk

The potential for disease transmission may mean the burial exclusion zone applies to both SPZ1 and SPZ2. The risk of pollution is site-specific and depends on a number of issues.

Animal carcass type and number

Large volumes of carcasses pose a greater hazard, especially in areas close to principal aquifers. These may have to go to existing landfill sites with permits to handle animal waste.

Risk of contamination and spread of pathogens

If this is a concern then you'll need to limit use of groundwater for drinking water, food production purposes and livestock watering.

Burial method and proposed site

Burial in unlined pits under emergency conditions will affect groundwater quality.

Surrounding geology

Areas with permeable deposits may result in a greater risk to the underlying groundwater. Areas of low permeability present a higher risk that contaminated water will build up and present a hazard to surface water.

Depth to the water table

You should allow for any potential rise in the water table. There must be no direct input of hazardous substances to groundwater and non-hazardous pollutants must be limited to avoid pollution.

Current and potential use of groundwater

As well as the risk to any current use of groundwater, over time the burial is likely to remain an active source of contamination so this may limit future use of groundwater. You need to avoid causing pollution to groundwater resources in future.

Emergency animal burial by weight

There are different requirements for the emergency burial of animal carcasses based on the animals' weight.

Less than 2 tonnes

You don't need permission from the Environment Agency for burials of less than 2 tonnes, but you should follow the minimum groundwater protection requirements.

You can carry out more than 1 burial a year, providing:

- no single burial exceeds 2 tonnes
- the burial sites are at least 500 metres apart
- the total weight of all carcasses buried is no more than 8 tonnes

Between 2 and 8 tonnes

Contact your local Environment Agency office for burials between 2 and 8 tonnes. It will work with you to:

- assess the risk of groundwater pollution
- decide if burial is safe
- advise if you need an environmental permit

Over 8 tonnes

You must have an environmental permit before burying animal carcasses over 8 tonnes. Contact your local Environment Agency office for further information for burials over 8 tonnes.

If the burials exceed 50 tonnes you will also need to show comprehensive plans for engineered containment and site management during and after burial.

For more information on emergency burials read Section M of the groundwater protection position statements.

You may have to follow the groundwater monitoring rules for animal carcass burials.

Guidance: Groundwater protection position statements

Updated: Updated The Environment Agency's approach to groundwater protection.

These position statements describe the Environment Agency's approach to managing and protecting groundwater. They update Groundwater protection: principles and practice (GP3).

This document helps anyone whose current or proposed activities have an impact on, or are affected by groundwater such as:

- developers
- planners
- environmental permit applicants and holders
- water abstractors

Many of the approaches set out in the position statements are not statutory but may be included in, or referenced by, statutory guidance and legislation.

Environment Agency staff use these position statements as a framework to make decisions on activities that could impact on groundwater. This clear approach

aims to remove uncertainty and potentially inconsistent decision-making.

Press release: Project launced to protect the Ouseburn River

Groundwork North East & Cumbria is working with partners from across the region to protect and preserve the upper part of the Ouseburn River.

The charity has secured £200,000 from the Environment Agency to fund the Ouseburn River Restoration Project.

Working with partners including landowners, communities, schools and local businesses, Groundwork will carry out a number of enhancements to the river and the surrounding environment to improve water quality through a number of environmental improvements.

The project will implement several physical measures to slow the flow of the river, including widening it at strategic points, sculpting areas of the river bank, altering meanders and installing silt traps.

In addition to the physical work, the Ouseburn River Restoration Project will also work with farmers and landowners about how to manage fertiliser and sediment run off, which causes high levels of phosphorus in the river, this diminishes invertebrate life and affects all aspects of river life.

Lesley Silvera, Senior Project Officer at Groundwork North East & Cumbria, said:

> It’s fantastic that the Ouseburn River Restoration Project is now off the ground. Over the next two years, we will be working closely with third parties to improve the water quality and ecology of the river.
>
> We’ll also be looking to survey and eradicate invasive species, remove litter, monitor wildlife and plant trees, which will keep the river cool, create riverbank habitats and help prevent bank erosion.
>
> We will be working in partnership with Newcastle University, the Environment Agency and Tyne Rivers Trust to observe and measure water quality to gauge the success of the scheme, which will also inform future work on the river.

Lucy Mo, the Environment Agency’s Project Manager responsible for funding this work added:

> The health of our rivers is better than it’s ever been with drastic improvements to water quality over the past 20 years. However, there is still more to do and by working with partners on projects such as the Ouseburn River Restoration Project we can play to different organisations’ strengths and deliver more.
>
> We’re pleased to be part of this exciting project, which will improve in-river and bankside habitats, and will also give us more water monitoring data and analysis.

The work is funded primarily through the Environment Agency. Additional funding is from Groundwork NE & Cumbria, Northumbrian Water Ltd, Newcastle University. Partners include Environment Agency, Northumbrian Water Ltd, Natural England, Tyne Rivers Trust, Newcastle City Council and Newcastle University.

Research and analysis: ACRE advice: application for a trial of GM Adenovirus 4 (16/R49/01)

This document is the Advisory Committee on Releases to the Environment (ACRE’s) advice to government in considering a request from Imperial College London (16/R49/01). The application is for a deliberate release of genetically modified virus (the vaccine) based on Adenovirus 4.

ACRE is satisfied that the trial will not have an adverse effect on human health or the environment.