



**POLICY AND PRACTICE
FOR THE PROTECTION
OF GROUNDWATER
SUMMARY DOCUMENT**



NRA

National Rivers Authority



An abandoned ironstone excavation in Northampton Sand, which is overlain by Lincolnshire Limestone and has intercepted the water table.

GROUNDWATER - OUT OF SIGHT, BUT NOT OUT OF MIND

When it rains, have you ever wondered what happens to all that water?

Some of it becomes surface water by flowing into streams, rivers and lakes. But much of it becomes groundwater, soaking away underground into waterbearing rocks called aquifers.

In many parts of the country, groundwater is everywhere beneath us. But because we can't see it, we shouldn't disregard it.

THE IMPORTANCE OF GROUNDWATER

Groundwater stored in aquifers is the principal source of water supply in many places. It is pumped from wells and boreholes or collected from springs and

provides over a third of the total public demand for water in England and Wales. In some areas it is the only local source of water both now and for the future.

Groundwater is widely used for private water supplies, industrial purposes and in agriculture, such as for the irrigation of crops and the watering of animals.

Groundwater does not stay underground for ever, but continuously feeds rivers and streams through springs and seepage into riverbeds. If this did not happen many of these rivers would dwindle or even

disappear altogether in dry weather. This would threaten the whole of the surrounding environment.

Many wetlands and the specific wild plants and animals that live there rely on groundwater for their very existence.



The top of a public supply borehole.
Courtesy Severn Trent Water

THE RISK TO GROUNDWATER

Groundwater is constantly under threat in our densely populated, highly industrialised country. Because groundwater and surface waters are so intimately linked, a threat to one can damage the entire water environment.

Pollution can come from one particular source (such as industrial waste storage), or from the wider, more diffuse use of chemicals (such as the application of fertilizers and pesticides to the land).

Groundwater is particularly at risk from sources of pollution which are diffuse and build up over many years. Often it is impossible to tell where this sort of

The operation of a chemical works can pose a significant risk to groundwater.





Sand and gravel extraction in River Terrace deposits.

A NATIONAL POLICY

In the past, there were many different approaches to groundwater protection. This led to differences in practice across England and Wales. Now the NRA has a comprehensive national policy to safeguard this essential natural resource. This ensures that there is a consistent approach to the prevention of groundwater pollution.

The NRA's policy covers all types of threat to groundwater. It helps the NRA and other organisations to implement the laws which can be used to protect groundwater.

The NRA is also producing a series of maps of England and Wales which show groundwater vulnerability. These will help to increase awareness of those places where groundwater is most at risk. Those responsible for planning the use of land will have access to these maps so that they know the potential impact their proposals will have on groundwater.

Some activities present a particular risk of pollution. The closer an activity is to a well or borehole, the greater the risk of the pumped water being polluted.

Around each groundwater source, the NRA has defined three Source Protection Zones. These vary in their size, shape and relationships according to the particular situation at any one place. The type of soil, the geology, the rainfall and the amount of water pumped out of the ground all have to be considered. We have published standard policy statements which deal with new developments within each of these three zones in addition to other areas where groundwater is generally at risk.



NRA officer discussing farm waste management plans with a farmer.

This policy will help potential developers, landowners, industrialists and others to gauge the likely response of the NRA to a particular proposal or activity which might affect groundwater.

All of us have a role to play in protecting groundwater. The more we understand groundwater and the potential threats to its availability and purity, the better we will be able to protect this valuable resource. The golden rule for groundwater must always be that **PREVENTION IS BETTER THAN CURE.**

If you would like to know more about the NRA's policies on groundwater protection, these have been published in "Policy and Practice for the Protection of Groundwater". Details on where to obtain copies of this document can be found on the back cover.

The lining of a new landfill on the Chalk with an artificial membrane in order to protect groundwater.





Trial pit investigation at a contaminated land site.



A landfill site in an old opencast coal excavation.

PROTECTING GROUNDWATER

Both the quality and quantity of groundwater must be protected.

If it becomes polluted, it is very difficult and expensive to clean up again. So it is better to prevent or reduce the risk of groundwater contamination in the first place, rather than deal with the consequences.

Because so much of our groundwater is used for drinking purposes, its quality must be maintained at all times.

Many aquifers store huge amounts of high-quality water which requires little treatment before it is used. If this widely available, low-cost source of water were damaged or lost completely, then more expensive alternatives would have to be found.

Groundwater must also be protected from over-use. If too much water is taken, there simply won't be enough to go round. If groundwater levels drop too far, unacceptable damage can be done to rivers, wetlands and the environment in general.

THE NRA'S ROLE

It is the duty of the National Rivers Authority in England and Wales to monitor and protect groundwater and conserve it for water resource usage. It is also the NRA's duty to maintain and conserve surface waters, which in many cases depends upon the proper management of groundwater.

The NRA's powers and duties are set out in the Water Resources Act 1991.

To protect groundwater **quality** the NRA has to:

- achieve and maintain specific targets for water quality (Water Quality Objectives);
- control potentially polluting discharges from, for example, industrial and agricultural premises, by issuing special consents;
- prevent pollution wherever possible;
- take remedial action if pollution occurs;
- take action against polluters.



To protect the **quantity** of groundwater the NRA has to:

- make sure water resources are used properly;
- manage groundwater so that acceptable flows are maintained in rivers;
- control the pumping of groundwater by issuing special licences;
- take action against people who remove groundwater illegally;
- take action to re-distribute and increase resources where needed.

The NRA can influence planning decisions which may damage groundwater. As the way the land is used and developed is one of the greatest and most consistent threats to the quality of groundwater, land-use planning policies can play a significant role in protecting groundwater. Therefore the NRA must keep in close contact with the Local Planning Authorities.

Dry bed of the River Granta resulting from a lowered water table caused by groundwater abstraction.



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NATIONAL LIBRARY & INFORMATION SERVICE

To obtain copies of any of the following documents, please send cl (made payable to the National Rivers Authority) or postal order

HEAD OFFICE

Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol BS32 4UD

National Rivers Authority
Newcastle-Upon-Tyne X
NE85 4ET

- Policy & Practice for the Protection of Groundwater (including the Groundwater Vulnerability Map)
- Individual copies of the Groundwater Vulnerability Map
- Summary Leaflets for the Groundwater Protection Policy Document

Price £13
Price £1

No Charge

Regional Appendices can be obtained from the appropriate regions free of charge



HEAD OFFICE

Rivers House
Waterside Drive
Aztec West
Almondsbury
Bristol
BS12 4UD
Tel: (0454) 624400
Fax: (0454) 624409

LONDON OFFICE

30-34 Albert Embankment
London SE1 7TL
Tel: (071) 8200101
Fax: (071) 8201603

ANGLIAN REGION

Kingfisher House
Goldhay Way
Orton Goldhay
Peterborough PE2 5ZR
Tel: (0733) 371811
Fax: (0733) 231840

NORTHUMBRIA REGION

Eldon House
Regent Centre
Gosforth
Newcastle Upon Tyne
NE3 3UD
Tel: (091) 2130266
Fax: (091) 2845069

NORTH WEST REGION

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Knutsford Road
Warrington WA4 1HG
Tel: (0925) 53999
Fax: (0925) 415961

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550 Streetsbrook Road
Solihull B91 1QT
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Fax: (021) 7225824

SOUTHERN REGION

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Chatsworth Road
Worthing
West Sussex BN11 1LD
Tel: (0903) 820692
Fax: (0903) 821832

SOUTH WEST REGION

Manley House
Kestrel Way
Exeter EX2 7LQ
Tel: (0392) 444000
Fax: (0392) 444238

THAMES REGION

Kings Meadow House
Kings Meadow Road
Reading RG1 8DQ
Tel: (0734) 535000
Fax: (0734) 500388

WELSH REGION

Rivers House/Plas-yr-Afon
St Mellons Business Park
St Mellons
Cardiff CF3 0LT
Tel: (0222) 770088
Fax: (0222) 798555

WESSEX REGION

Rivers House
East Quay
Bridgwater
Somerset TA6 4YS
Tel: (0278) 457333
Fax: (0278) 452985

YORKSHIRE REGION

21 Park Square House
Leeds LS1 2QG
Tel: (0532) 440191
Fax: (0532) 461889

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Pulverised fuel ash from power stations is deposited in sand and gravel excavations in the Trent valley.

pollution comes from. Also, because groundwater moves so slowly through the layers of rock, problems can take many years to appear.

Some groundwaters are more vulnerable to pollution than others. This depends upon such things as the type of rocks, the soils that overlie them and how far the water table is below the surface. Different pollutants pass through different soils and rocks at differing speeds. Others may be diluted or stopped altogether.

However, pollution is not the only problem.

We can also affect the availability of groundwater if we prevent the groundwater reserves from refilling. This can be done by diverting the flow of water, changing land use, or by extracting minerals from the rocks. If too much groundwater is pumped for public supply, streams and wetlands may dry up.



The spreading of farm waste onto grassland

Courtesy Severn Trent Water

Diagrammatic representation of the Water Cycle showing groundwater and surface water relationships and groundwater pollution risks.

