Clean Water or Energy?
Stop Micro-plastic Pollution Now!

A look the potential long-term impact of developers leaving over 1,000 km of XLPE cables permanently buried—threatening local agriculture and a vital source of drinking water.

Say No To One Earth Solar Farm

North and South Clifton, Fledborough, Ragnall and nearby
North Notts and Lincs

June 2025

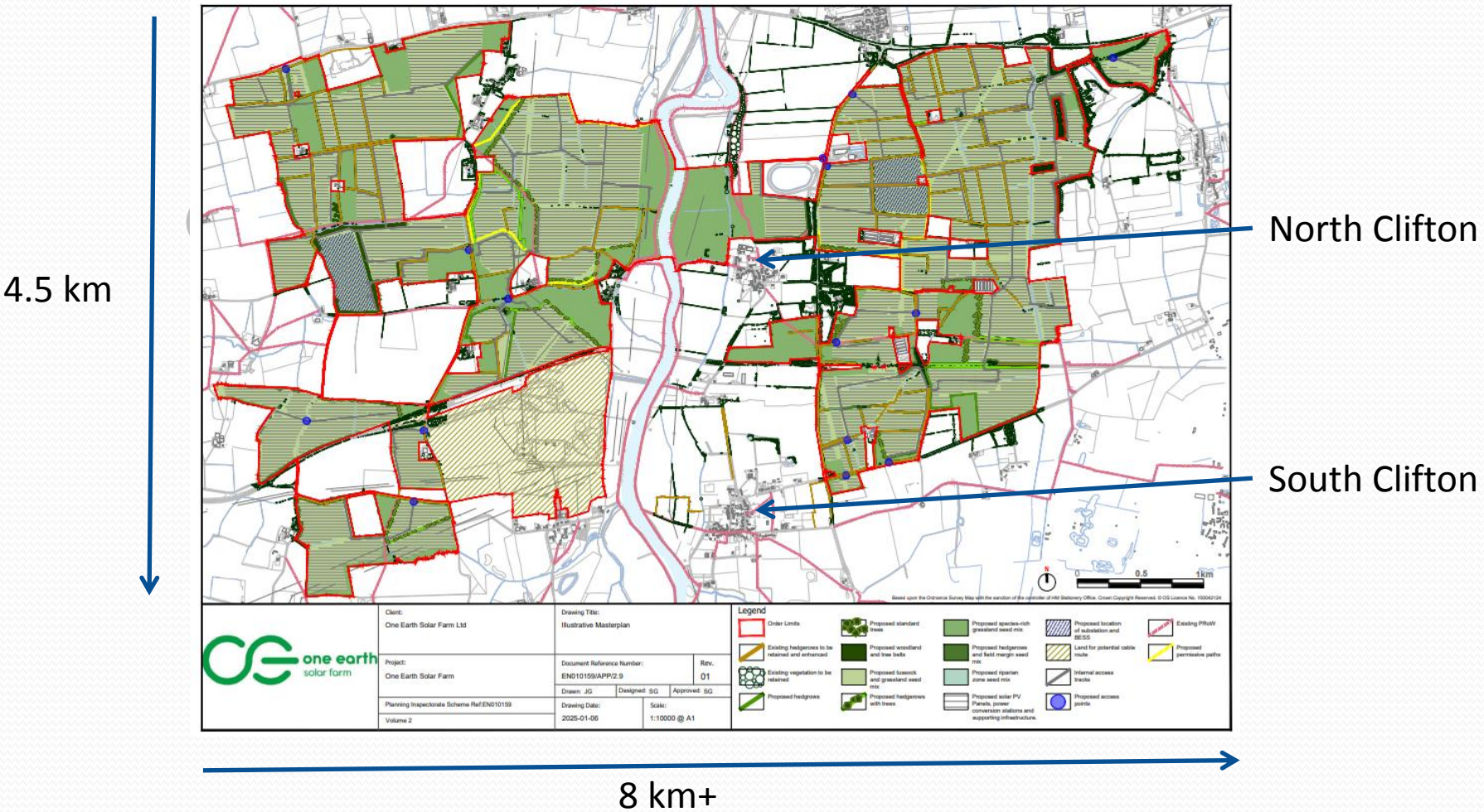
One Earth Solar Farm

- Announced Sept 2023
- Proposal for a massive solar farm: 740 MW built over almost 4,000 acres agricultural land.
- Site located primarily on of 53% Grade 3a or better farmland across Nottinghamshire and Lincolnshire
- Claimed benefits: clean energy for 200,000 homes, local investment, around 15 jobs, and the land will be better for farming at the end of the 60 years.

One Earth Solar Farm

- Includes 1.4 million industrial solar panels.
- 196 shipping container sized solar inverters.
- 2 x massive battery storage (BESS) sites containing hundreds of shipping containers, with thousands of lithium batteries.
- 2 x Large Electrical Sub-Stations

The Development, the 4000 acre One Earth Solar Farm, 36km^{sq}, 14miles^{sq}



Local Voices: Polled at 99% Against Concerns from the Ground

- “We need to protect UK food security.”
- “Too close to family homes, loss of view amenity.”
- “Worries over increased risk of flooding.”
- “Supply chain linked to Human right’s abuses.”
- “Worries around roaming deer and other wildlife.”
- “Dangers from BESS fires, very noisy infrastructure, loss of natural countryside amenity, effects on mental health.”
- “Cumulative effect with JG Pears Hydrogen Plant, massive quarry at South Clifton.”
- “Could be completely replaced with 13 large off-shore wind turbines”
- “West Burton Step Fusion to come.”

Drinking Water Protected Area

- Site overlaps Drinking Water Protected Area GB104028058480 (Map)

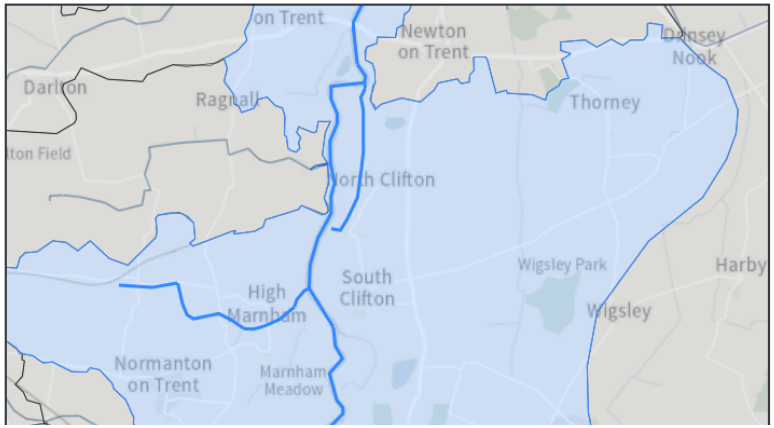
Department for Environment Food & Rural Affairs — Data Services Platform

Environment Agency — Catchment Data Explorer — Home Search Help API

Home / Humber / Trent Lower and Erewash / Trent and Trib / Trent from Carlton-on-Trent to Laughton Drain

Trent from Carlton-on-Trent to Laughton Drain Water Body

Moderate ecological status



Protected areas

PA Name	Id	Directive
Trent from Carlton-on-Trent to Laughton Drain	UKGB104028058480	Drinking Water Protected Area

GB104028058480 is a legally recognised protected catchment for drinking water sources.

The image shows the zone's boundaries and context.

Included in the solar farm development zone are the 20 acre North Clifton Reservoir And the Anglian Water: Hall Water Treatment works Together providing up to 20million litres of drinking water per day to the city of Lincoln (image below)

Massive Solar Farm Development on a Drinking Water Protected Area?

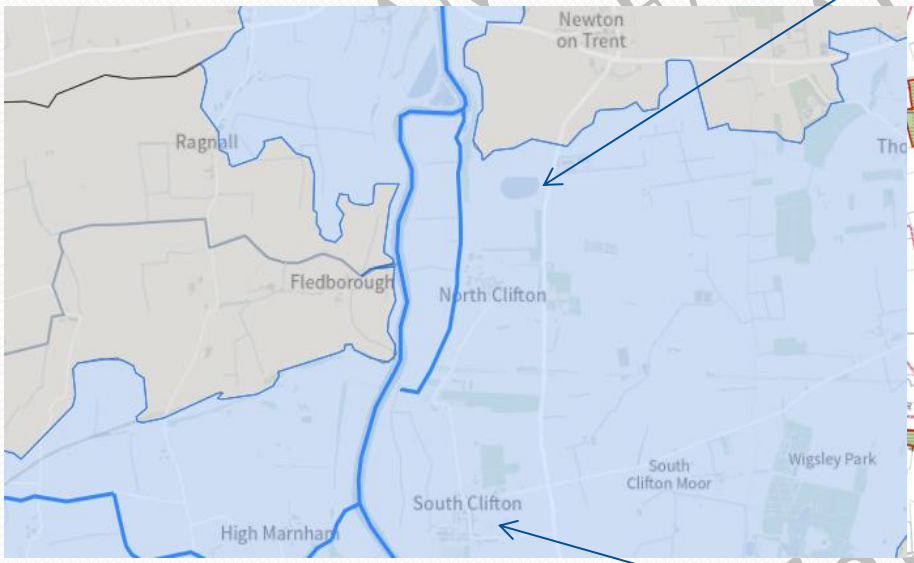
- What is a DrWPA?
- A **Drinking Water Protected Area (DrWPA)** is a designated zone that safeguards sources of public drinking water—such as rivers, aquifers, and reservoirs—from pollution and degradation.

- Why are DrWPAs Important?
- These areas are critical for ensuring clean, safe water for communities and ecosystems, often supplying thousands or even millions of people.
- Because they are directly linked to human health and environmental wellbeing, DWPAs must be protected from industrial development, hazardous chemicals, and activities that increase the risk of contamination.
- **Preserving their integrity is essential for public safety, sustainable agriculture, and long-term water security.**

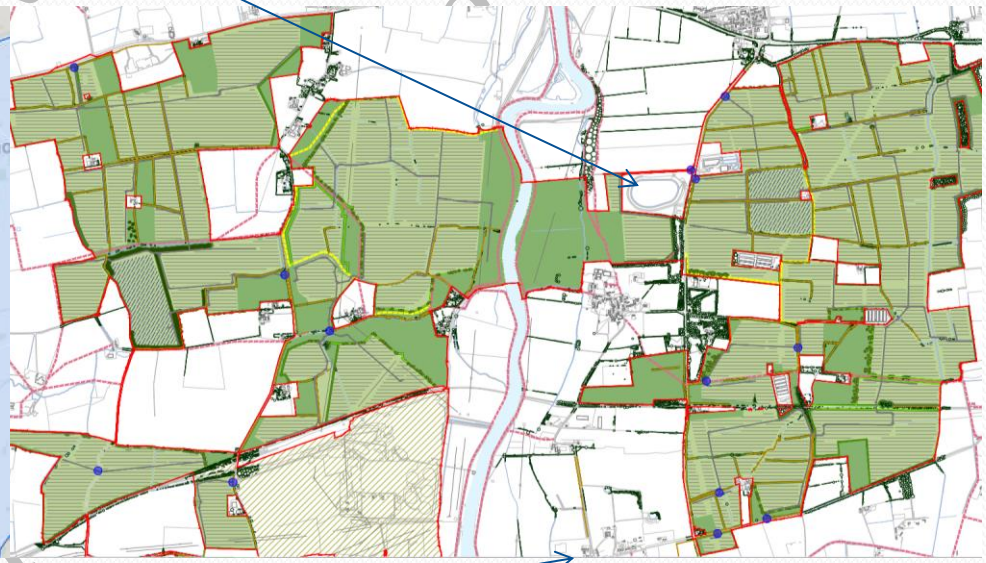
Drinking Water Protected Area

- ‘DWPA’ Map

Trent from Carlton-on-Trent to Laughton Drain Water Body



One Earth Solar Farm Map



Reservoir

South Clifton

What Protections are in place

- Drinking water protected areas are offered protection from several legislative and strategy documents including;

- The Water Framework Directive (WFD) (2000/60/EC)
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
- **The Drinking Water Directive (98/83/EC)** and its UK transpositions:
- The Groundwater Protection Policy
- The 1990 Environmental Protection Act

- Designated under the **Water Framework Directive (WFD)**, DrWPAs are areas around water sources used for drinking. They are protected from activities that could cause contamination (e.g., pollution from agriculture, industry, or infrastructure).
- Authorities must **prevent deterioration** in water quality.
- An EU directive (retained in UK law) requiring all water bodies to achieve **good ecological and chemical status**.
- Sets environmental objectives for rivers, lakes, estuaries, coastal waters, and groundwater.
- Requires **monitoring**, **risk assessment**, and **action plans** for any threats to drinking water.
- **Pollution Prevention Guidelines & Environmental Permitting**
- Land use or industry near water sources must follow strict environmental permitting rules and **best practice pollution prevention**.
- Includes rules for storage of fuels, chemicals, and waste.
- **Planning Policy Protections (e.g., NPPF)**
- National planning policies (like the **National Planning Policy Framework**) require local planning authorities to:
- Prevent inappropriate development in sensitive areas. Consider **source protection zones and drinking water risk** when evaluating new infrastructure.
- **Public Right to Safe Water**
- UK law incorporates aspects of the **UN Human Right to Water**, ensuring water supplies are:
- **Safe** (free from contamination), **Accessible** (within reasonable distance), **Affordable**

A Catalogue of Concerns

- If a **Drinking Water Protected Area (DrWPA)** becomes polluted — whether from **chemicals released by a BESS fire**, **firefighting run-off**, **inverter fires**, or **microplastic pollution from decaying cables** — the potential consequences are serious, with implications for **human health, ecosystems, legal compliance**, and **public trust**.
- If pollutants like **hydrofluoric acid**, **heavy metals**, **lithium salts**, or **organic toxins** enter aquifers or surface water supplies, they can pose immediate and long-term health risks (e.g. cancers, organ damage, neurological effects).
- **Soil and groundwater poisoning**: Substances from BESS and inverter fires — such as **polyfluoroalkyl substances (PFAS)** and **dioxins** — are highly persistent and can migrate through soils, making land and groundwater unusable for decades.

A Catalogue of Concerns

- **Microplastics ingestion**: These particles can carry **endocrine disruptors, pathogens**, and **persistent organic pollutants** that may pass through filtration systems.
- **Irreversible aquifer damage**: Groundwater aquifers — particularly those supplying public water — are slow to flush out pollutants. In some cases, pollution can **persist for generations**, making the water source permanently unusable.
- **Legacy pollution**: Micro-plastics from **decaying XLPE or HDPE cables** can accumulate over time, introducing chronic contamination that is extremely difficult to monitor or remove.

Missing Information

- Over 1000km+ of Buried Cables

- We have been unable to get the developers One Earth Solar Farm to confirm where important infrastructure such as the 196 massive solar inverters will be built.
- To connect all this up, we estimate around 1000-1200 kms of 33kv XLPE electrical cables, estimated to weigh around 6.5 kgs per metre, will be buried across the 4000 acres
- One Earth Solar Farm have said in their documentation that buried cables will remain permanently buried.
- That could be 6500-7800 tonnes of plastics and heavy metals left buried permanently across the farmland
- Over 4 tonnes of XLPE Plastics and metal per hectare.

Long Term Pollution Dangers

- **What could the effects be?**
  XLPE is a thermoset plastic and doesn't melt or dissolve easily, but over decades, it can break down into **micro and nano-plastics.**
- XLPE micro-plastics can migrate more efficiently through porous soils, especially in sandy or flood-prone areas.
- Once in groundwater aquifers, these particles are extremely difficult to remove via standard filtration.
- Micro-plastics can act as vectors for adsorbed pollutants, including heavy metals, pesticides, and hydrocarbons.

Long Term Pollution Dangers

- Though XLPE is more stable than PVC, it can still contain:
- Cross-linking agents (e.g., organic peroxides)
- Antioxidants, stabilizers, and plasticizers
- Flame retardants (e.g., brominated compounds in certain cables)
- These chemicals may:
- Leach into surrounding soil and water
- Persist for years in groundwater systems
- Pose toxicological risks even at low concentrations

Microplastics and Nanoplastics

- **Threats to Water Treatment Infrastructure**
- Current drinking water treatment processes are not fully effective at removing micro-plastics—especially smaller fragments (<1 µm) and nano-plastics.
- Persistent contamination could:
- Increase filtration costs
- **Lead to long-term accumulation in reservoirs and distribution systems**
- **Irreversible aquifer damage**: Groundwater aquifers — particularly those supplying public water — are slow to flush out pollutants. In some cases, pollution can **persist for generations**, making the water source permanently unusable.
- **Legacy pollution**: Microplastics from **decaying XLPE or HDPE cables** can accumulate over time, introducing chronic contamination that is extremely difficult to monitor or remove.

Potential Effects of Excessive Microplastics on Agriculture – Developers claim it will be better for farming after 60 years.

- **Effects on Soil Structure and Function**
  Microplastics can alter the physical properties of soil, including:
- Reduced porosity and water retention due to particle intrusion, impaired soil aggregation, which affects aeration and root penetration. Changes in bulk density, which may influence crop growth and soil workability
- **Impact on Soil Biota**
  Microplastics can be ingested by soil-dwelling organisms such as earthworms, nematodes, and insects, leading to: Physical blockages or damage to digestive systems
- Reduced reproduction rates and altered behavior, Bioaccumulation of toxic additives or sorbed pollutants, including phthalates, heavy metals, and persistent organic pollutants (POPs)
- **Agricultural Implications**
  In agricultural systems, the presence of microplastics can: Hinder root development and reduce crop yield
- Facilitate the transfer of plastic particles into plant tissues, raising potential food safety concerns, Reduce microbial diversity and affect symbiotic relationships such as mycorrhizal fungi, which are vital for nutrient uptake Furthermore, microplastics may alter the soil's chemical environment, impacting the effectiveness of fertilizers and pesticides, and introducing long-term contamination that is difficult to remediate.
- **Ecosystem-Wide Consequences**
  At the ecosystem level, microplastics in soil contribute to:
- Loss of biodiversity through habitat degradation and species stress, disruption of ecosystem services, such as water filtration, carbon storage, and plant productivity
- Potential trophic transfer of plastic particles and associated toxins through food chains, over time, this pollution could compromise the ecological integrity and productivity of natural and managed landscapes alike.
- **Sandy Soil: High Permeability, Low Retention**
  Sandy soils are characterized by large particles, loose structure, and high drainage capacity. This affects microplastic pollution in several ways:

Potential Effects of Excessive Microplastics on Agriculture – Sandy Soils and Flood Prone Areas.

- **Increased Mobility of Pollutants**
- **Microplastics** and leached additives (e.g. peroxides, antioxidants, or residual flame retardants) from XLPE cables can **migrate more easily** through sandy soils.
- **Vertical transport** is faster, increasing the risk of **groundwater contamination**.
- **Limited Filtration or Adsorption;** Unlike clay or organic-rich soils, sandy soils have **low cation exchange capacity** and minimal organic matter. This reduces the soil's ability to **trap microplastics or adsorb chemical contaminants**, meaning they **spread further and faster**.
- **Soil Biota Exposure:** Soil organisms (e.g. earthworms, springtails) are more likely to **encounter or ingest microplastics**, as the particles are not well-retained or shielded.
- **Flood-Prone Land: Increased Distribution and Surface Spread**, Flood-prone areas further amplify the pollution potential due to hydrological dynamics.
- **Types of Crops Most Effected by Micro-plastic Pollution**
- Root and Tuber Crops
  The very crops currently being grown in the development zone and very popular and successful in this area.
- **Examples:** Carrots, potatoes, radishes, beets, parsnips
- **Why they're vulnerable:**
- Direct soil contact means **greater exposure** to microplastics and leachates.
- Microplastics can **alter root morphology**, reduce root length, and disrupt nutrient uptake.
- There's evidence of **micro-plastic uptake** into edible parts in some root crops.

Long Term Pollution Dangers

- **Why leave 1000 km+ cables in the ground?**
  Many in our community believe the over-riding reason for leaving these cables in the ground is both the cost of retrieval, and the cost of recycling.
- XLPE cables – the type most likely to be used – although offer advantages in their strength are more difficult and expensive to recycle.
- Many in our communities believe Ørsted will sell at least 50% of the One Earth Solar Farm development – they have already sold multiple solar farms – to fund future growth.
- The requirement of a substantial decommissioning fund could however complicate any sale processes, with the removal of the obligation to fully decommission it though; many believe this fund could be significantly reduced—making the development more financially attractive to potential buyers.
- This has led many residents to view the decision to leave cables in the ground as primarily a financial decision, made with little regard for long-term commitments to the community, environmental responsibilities, or the potential for future pollution.

Planning Agencies: Watching or Waving It Through?

- Environment Agency: Must protect groundwater – but limited resources, first no WFD specialist sent to meeting, then one not available, then developers simply provided with a link to the legislation and asked to report back if any questions.
- Parish Councils: May raise concerns but often overridden
- Local authority planners: Caught between targets and local resistance
- Lack of confidence in Environmental Impact Assessments?
- With NSIP planning processes 'front-loaded' towards applications, MPs are finding it difficult to be able to help as much as they might wish to
- With everything seemingly weighted against the wishes of local populations, confidence in the system runs very low leaving people feeling concerns are being ignored and they feel left out of the decision processes.

Clean Energy Must Still Be Clean

- Preserving Core Sustainability Goals: Green energy should not cause environmental harm, or it defeats its own purpose.
- Protecting Drinking Water Supplies: Drinking water protected areas (DWPAs) are essential for public health; any contamination risks from batteries, cables, or chemicals are unacceptable.
- Preventing Chemical Pollution: Fires, leaks, or degradation in green infrastructure (like BESS or XLPE cables) can release toxic substances, threatening soil and water.
- Avoiding Irreversible Ecosystem Damage: Once farmland or aquifers are polluted, recovery is slow or impossible—prevention is the only viable strategy.
- Maintaining Public Trust in the Green Transition: If renewable projects cause visible environmental harm, public support for net-zero policies may collapse.
- Complying with Environmental Regulations and Ethics
- Many protections exist for water and soil—true green projects should exceed minimum standards, not work around them.
- Addressing Hidden Long-Term Risks Buried cables, plastics, and synthetic materials may degrade over time, leaching into the environment—especially in flood-prone or sandy soils.
- There are better alternative sites: Precautionary principle: “If in doubt, don’t build it here”

Date: June 2022

Drinking Water Protected Areas: challenges for the water environment

The problem

We must protect our drinking supplies so they are not polluted, making them more resilient to future pressures and climate change. The rivers, lakes and groundwater that currently (or will in the future) supply more than 10m^3 per day of water for human consumption, or serve more than 50 people, are identified as Drinking Water Protected Areas (DrWPAs). This includes public drinking water supplied by water companies to their customers and private water supplies for domestic dwellings or the food and drink industry.

The objectives for Drinking Water Protected Areas are:

- to ensure that, under the water treatment regime applied, the drinking water produced meets the requirements of the Water Supply (Water Quality) Regulations 2016
- to ensure the necessary protection of the supply by avoiding deterioration in water quality to reduce the level of purification treatment required in producing drinking water
- for groundwater, to meet good chemical status and reverse upward trends in pollution

Protecting supplies by avoiding deterioration in water quality and, for groundwater, reversing upward trends in pollution requires pollution to be prevented from entering the environment. This, in turn reduces the need for expensive and unsustainable treatment.

Understanding the risks posed to drinking water sources in a catchment is a central part of the World Health Organisation's water safety planning approach[1]. Investing in collaborative catchment management reducing pollution at source is a more cost-effective approach than removing the pollutants or blending with clean water.