Response to Planning Inspectorate Q12.0.6 (Response Date: 20th August 2025)
Interested Party Ref: F950A45AB

South Clifton Parish Council concerns regarding the One Earth Solar Farm and The River Basin Management Plan Water Framework Directive requirements

This submission was written in conjunction with David White and the Say No to One Earth Solar action group

Introduction

The River Trent and its associated catchment between Carlton-on-Trent and Laughton Drain represents a highly sensitive environmental and infrastructure corridor of regional and national importance. This section of the Trent supports interconnected aquatic and terrestrial ecosystems, provides essential ecological services, and contains critical water supply infrastructure. The North Clifton reservoir and the Anglian Water treatment works located within this area supply up to 2 million litres of potable water per day to Lincoln and surrounding settlements, forming a key component of public water security.

In accordance with the **Water Framework Directive (2000/60/EC)**, as transposed into UK law, and the **Environment Act 2021**, public bodies and planning authorities are required to protect and enhance the status of surface and groundwater bodies, ensuring that development proposals do not compromise ecological status or water quality objectives. The designation of the River Trent and its aquifers as a Drinking Water Protected Area (DWPA) underlines their statutory importance and the obligation to prevent deterioration.

Local communities, including parish councils and residents within the vicinity, have expressed significant concern that the proposed 4,000-acre One Earth Solar Farm development presents an unacceptable risk to this protected water environment. Potential sources of pollution, including from large-scale construction activity, 2 massive BESS sites (totalling 740MW), 196 large solar inverters, extensive buried cabling and infrastructure, and the long-term degradation of synthetic materials, raise legitimate questions regarding compliance with the **National Planning Policy Framework (NPPF)**, which requires planning decisions to avoid pollution and to contribute to the protection and enhancement of valued landscapes and natural assets.

Balancing Renewable Energy with Water and Ecological Protection

Given the scale of the proposed development and its proximity to critical water infrastructure, there is a clear and overriding need to ensure that statutory protections are upheld and that precautionary principles are applied. The safeguarding of the River Trent corridor, its ecosystems, and its role in securing drinking water supplies must be regarded as paramount considerations in the planning balance.

Given the potentially significant impacts of constructing a large-scale solar development in close proximity to critical water infrastructure and protected ecosystems, a rigorous precautionary approach is warranted. Planning authorities and inspectors must weigh renewable energy benefits against statutory duties to protect water quality, ecological integrity, and public supplies.

Key Concerns Regarding Potential Impacts on Water Quality & Hydrology

Surface Conditions & Construction-Sourced Runoff

Surface conditions and construction-sourced runoff from a development of this scale present a significant pollution risk to both groundwater and the network of dykes, drains, and ditches that ultimately feed into the River Trent. Large areas of soil disturbance, heavy vehicle movements, and vegetation clearance can mobilise sediments, oils, fuels, and other contaminants, which in turn can enter surface water pathways. Given the permeability of the underlying soils and the hydrological connectivity of agricultural drains to groundwater and the river system, such runoff can accelerate the transfer of pollutants into Drinking Water Protected Areas, degrading water quality and undermining the ecological and chemical objectives set out under the Water Framework Directive. The cumulative effect could compromise both sensitive habitats and the integrity of the public water supply.

News Stories demonstrating this (including QR Code links);

[redacted]

[redacted]

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CLIMATE

Major solar farm builder settles case alleging it violated clean water rules

BY THE ASSOCIATED PRESS
Updated 11:59 PM BST, January 17, 2024

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WASHINGTON (AP) — A U.S. construction company that built solar farms across the country will pay $2.3 million in penalties to settle claims that it violated federal and state water protections in Alabama, Idaho and Illinois, the U.S. Department of Justice and Environmental Protection Agency said Wednesday.

Swinerton agreed to pay the penalty and undertake mitigation measures for its alleged Clean Water Action violations during the construction of solar farms in the three states that began in 2016.

A complaint alleged that Swinerton did not have its building sites inspected by qualified personnel and failed to accurately address or report stormwater issues at its solar farms near American Falls, Idaho, near Lafayette, Alabama and in Perry and White Counties, Illinois. At the Alabama and Idaho sites, the complaint said Swinerton's actions led to large amounts of stormwater discharges in nearby waterways.

News

Solar farms run into problems with water pollution

ecshitv March 23, 2024 0

Last month, the US Environmental Protection Agency and Department of Justice announced more than a million dollars in penalties against companies for polluting local waterways. The culprits? Four solar farms in Illinois, Alabama, and Idaho.

"The development of solar energy is a key component of [the Biden] administration's efforts to combat climate change," said Larry Starfield, an administrator at the Environmental Protection Agency (EPA), in a press release on November 14. "These settlements send an important message to the site owners of solar farm projects that these facilities must be planned and built-in compliance with all environmental laws."

Disruption of Key Water Cycle Components, including Soil Moisture Redistribution & Hydrological Changes

The proposed development also raises wider concerns regarding the disruption of key water cycle components, particularly soil moisture redistribution and local hydrological balance. Large-scale groundworks, compaction from construction traffic, and the installation of extensive impermeable and semi-permeable infrastructure can alter natural infiltration patterns, reduce soil water retention, and accelerate surface runoff.

Such changes risk modifying the flow regimes of connected ditches, drains, and groundwater pathways, with potential knock-on effects for both water availability and water quality. In a sensitive catchment feeding directly into the River Trent and a designated Drinking Water Protected Area, these hydrological alterations could undermine the resilience of local ecosystems and compromise the long-term security of the public water supply.

- The imperviousness of solar panels alters how rainwater is distributed: moisture tends to accumulate at the fronts of panels while under-panel areas may be drier.
- Simulations in arid regions (e.g., American Southwest) show net **reductions in evapotranspiration**, yet altered local humidity and wind patterns—highlighting complex effects on the water cycle
- **Soil moisture, temperature, evaporation**: LSSFs significantly alter these components, potentially compromising natural moisture retention and local climate regulation.
- Such disruptions could influence river levels or groundwater balance critical for drinking water supplies.

Runoff, Infiltration, and Erosion Hazards

- LSSFs, with their large impervious surfaces, can **increase surface runoff**, particularly under certain panel orientations and land slopes.
- **Infiltration suffers**, especially in compacted or denuded soil, reducing groundwater recharge—a red flag if a reservoir depends partially on aquifer recharge.
- During both installation and operation, **soil erosion and sedimentation** can spike, risking clogging or contaminating nearby water sources with sediment-laden runoff.

Chemical and Thermal Pollutants

- Potential **chemical runoff**—from panel-cleaning agents, lubricants, herbicides, or dust wash-off—that could degrade water quality in the drinking water aquifer and ditches feeding the river.
- Elevated surface or water temperatures—particularly in floating PV setups—can raise water temperature, harming aquatic ecosystems and possibly contributing to chemical imbalances or reduced oxygen levels.

Microclimate and Heat Island Effects

- LSSFs can create **photovoltaic heat island effects**, elevating local night-time temperatures by 3–4 °C in some regions. This alteration can change local humidity and wind patterns, indirectly affecting evaporation, moisture retention, and hydrological balance.
- In water-scarce regions—where water availability is already fragile—these effects are **amplified**, posing heightened risk to ecosystems and drinking water reserves.

(Case Study, including QR Code link)

While the review below often references arid regional studies (e.g., Saudi Arabia), the mechanisms are relevant in any context where a protected water source could be impacted.

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Home > Journal of Umm Al-Qura University for Engineering and Architecture > Article

A review: the potential impact of large-scale solar farms (LSSFs) on the water cycle

Review | Open access | Published: 13 February 2025

Volume 16, pages 206–223, (2025) Cite this article

Abdulaziz S. Alzahrani

Abstract

In renewable energy sources, wind and solar power plants are the anticipated largest benefactors to worldwide decarbonization and will be ranked as the most projected energy suppliers by 2050. Solar energy has reached new levels of affordability as a renewable energy source though they have a firm impression on the environment. The large-scale solar farms (LSSFs) cover hundreds of acres, potentially impacting the natural environmental ecohydrological processes like runoff generation and erosion. The purpose of the present paper is to appraise the present status of systematic exploration of LSSFs and their impact on the water cycle and the environment and the currently known recommendations for site management. Key findings demonstrate that LSSFs have substantial variations in hydrological cycle components in soil moisture, temperature and evaporation. Erosion reduction, strategies to control runoff and water management plans are warranted to diminish adversative impacts safeguarding sustainable amalgamation of LSSFs into the milieu.

[redacted]

Concerns over Infrastructure Fires in BESS or large scale inverters

The siting of a large Battery Energy Storage System (BESS) together with 196 solar inverters within a designated Drinking Water Protected Area poses a serious pollution risk in the event of fire. Fires involving lithium-ion batteries and inverter components are known to generate toxic leachates and firewater runoff containing heavy metals, fluorinated compounds (such as HF), and persistent organic pollutants. In an area underlain by permeable soils and hydrologically linked to the River Trent and its tributaries, such contaminants could infiltrate groundwater or be transported via surface ditches and drains, directly threatening drinking water supplies and the ecological status of the river system. This creates a clear potential pathway of harm that is inconsistent with the statutory protections afforded to Drinking Water Protected Areas under the Water Framework Directive.

BESS Fires

Common battery chemistries (Li-ion, LFP, NMC) can release:

- **Dioxins and dioxin-like compounds** – formed when plastics (like PVC) and halogenated flame retardants burn.
- **Polybrominated diphenyl ethers (PBDE)** – used as flame retardants in battery enclosures or other components.
- **Benzo(a)pyrene, Benzo(b)fluoranthene, Fluoranthene, Benzene** – combustion byproducts from burning plastics and hydrocarbons.
- **Cadmium and compounds** – may be present in older battery chemistries (e.g. NiCd) or solder.
- **Nickel and its compounds** – present in NMC batteries.
- **Lead and its compounds** – possible in battery connections or older systems.
- **Mercury** – rare in modern systems but possible in some electrical components.
- **Perfluorooctane sulphonate (PFOS)** – used in some fire suppression foams (though banned in the EU for most uses).

Large Solar Inverter Fires

Inverter fires involve PCBs, metals, capacitors, and cooling materials:

- **Dioxins** – from burning halogenated materials (e.g., wires, circuit boards).
- **PBDEs** – flame retardants in electronics.
- **Benzene, Benzo compounds** – formed from combustion.
- **Lead, Nickel, Cadmium** – from solder, capacitors, and batteries.
- **Hexachlorobenzene**, **Polychlorinated substances** – possible in electrical equipment combustion.

Solar Panel Damage

Particularly relevant during mechanical breakage, fire, or aging:

- **Lead, Cadmium, and their compounds** – found in some thin-film panels (CdTe).
- **Hexachlorobutadiene**, **Trichlorobenzenes** – possible from flame retardants or old components.
- **PFOS/PFAS-like substances** – used in panel manufacturing or coatings (surface treatments, anti-reflective coatings).
- **Nickel**, **Fluoranthene**, **Benzo(a)pyrene** – trace contaminants or combustion byproducts if fire occurs.

Decaying XLPE Cables (especially in soil/water)

As XLPE cables degrade via oxidation, heat, or microbial action, particularly if exposed to other pollutants:

- **Benzo(a)pyrene, Fluoranthene, and similar PAHs** – can form from thermal decay or microbial transformation.
- **Dioxins and furans** – possible with heat and flame retardants present.
- **Lead, Cadmium, Chromium** – from sheathing or legacy cable materials.
- **Nonylphenol** – degradation product from older plasticizers or additives.
- **PFAS / PFOS** – not native to XLPE, but could migrate if near contaminated zones (or if insulation contains PFAS coatings).
- **Microplastic formation** – XLPE itself becomes a microplastic pollutant, and may adsorb or release other listed substances over time.

Summary: High-Risk Chemical Matches

Scenario	**Likely Substances**
BESS fire	Dioxins, PBDEs, PAHs (e.g., Benzo[a]pyrene), Cadmium, Nickel, PFOS
Inverter fire	Lead, Dioxins, PBDEs, Benzene, Trichlorobenzenes
Solar panel breakage	Lead, Cadmium, Nickel, PFAS, PAHs
XLPE decay	Microplastics, PAHs, Nonylphenol, Lead, potential adsorbed pollutants

Especially Dangerous Substances for Water and Soil

PFOS / PFAS

- **Perfluorooctane sulphonate (PFOS)** is a **persistent, bioaccumulative, and toxic** substance.
- **Widely banned** in the UK and EU due to links to cancer, immune suppression, and water contamination.
- **Water-soluble**, can persist in groundwater for decades.
- Can be released by:
  - Firefighting foam use during BESS/inverter fires.

- Leaching from solar panels or coatings.
- Contaminated materials left in the ground (e.g., PFAS-treated cable sheathing).

Heavy Metals (Cadmium, Lead, Mercury, Nickel)

- Common in electronics, solar panels, inverters, and some cable coatings.
- **Cadmium**: used in some solar panels (CdTe); extremely toxic to kidneys and soil biota.
- **Lead**: neurotoxin, accumulates in soil and water.
- **Mercury**: bioaccumulative, especially dangerous in aquatic environments.
- **Nickel**: toxic to aquatic organisms; causes dermatitis in humans.

These metals **do not break down**, accumulate in soil and water, and may **breach groundwater protection zones**.

Dioxins and Furans

- Byproducts of **burning plastics and brominated flame retardants**.
- **Among the most toxic compounds known** (carcinogenic, mutagenic, endocrine disruptors).
- Can adsorb to microplastics and soil particles, **persist in sediment and agricultural soils**.

PAHs (e.g., Benzo(a)pyrene, Fluoranthene)

- **Carcinogenic** polycyclic aromatic hydrocarbons.
- Produced during fires (BESS, inverters), or slowly during **decay of plastics like XLPE**.
- Absorb to soil and sediment; can contaminate food chains.

Nonylphenol and PBDEs (Flame Retardants)

- **Endocrine disruptors**, banned or restricted in the UK.
- Released during combustion or leaching from decaying equipment or cables.
- Persistent in soil and water; toxic to aquatic life.

How the proposal could cause failure of the WFD Regulations (incl. regulation 19)

Regulatory context and test to be met

The WFD Regulations set statutory environmental objectives, including to prevent deterioration in status and to achieve good status of surface and groundwater bodies, and to protect Drinking Water Protected Areas (DWPAs). These objectives apply through river basin management planning and protected-area duties (regs. 12–18). Derogations under regulation 19 are tightly constrained and available only for specific new modifications/alterations where strict tests (overriding public interest, lack of better environmental options, and mitigation to the maximum extent) are satisfied; they are not a general licence to accept deterioration.

A DWPA designation identifies waters used (or intended) for drinking-water abstraction; Safeguard Zones are defined where the DWPA is “at risk” and require targeted pollution-prevention actions to avoid deterioration and to reduce treatment need at the works. Locating major hazardous plant within a DWPA/Safeguard Zone therefore raises a high evidential bar: the scheme must show no likely deterioration of the body/water, no increase in risk to the abstraction, and no undermining of RBMP measures.

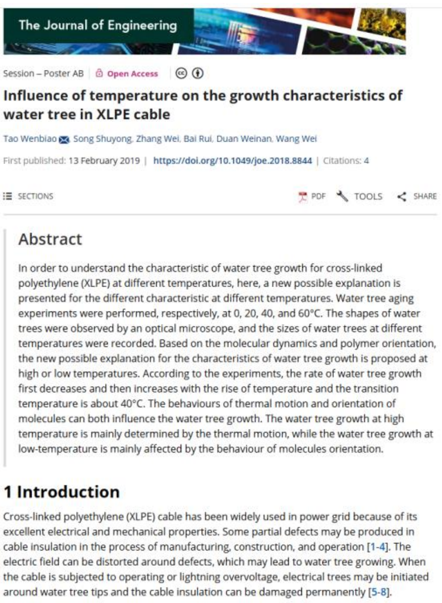
Credible pollution pathways from the scheme

Thermal-runaway and firewater contamination from BESS and inverter fires. Lithium-ion battery failures release toxic gases (notably hydrogen fluoride generated from $LiPF_6$ electrolytes) and particulates; firefighting run-off can entrain dissolved fluoride, organics and metals to surface drains, ditches, dykes and shallow groundwater. Incidents at large BESS sites have required evacuations and extensive environmental response, illustrating realistic source-term magnitudes. With only "2 hours" of on-site containment capacity, credible multi-container or prolonged reignition events could exceed containment, discharging to the DWPA catchment, adjacent reservoir and the water treatment works' intake. This creates a pathway for deterioration of chemical status and for DWPA treatment-burden increases contrary to Article 7/WFD objectives transposed in the Regulations.

Construction and operational runoff over 4,000 acres. Major greenfield solar schemes routinely identify risks of siltation, hydrocarbon/chemical spills and altered hydrology during construction and maintenance; these affect small ditches and ordinary watercourses that feed the main river and, in a DWPA, can drive status deterioration and failure of protected-area objectives if not fully controlled. The scale here (4,000 acres; 196 inverter/transformer compounds; extensive tracks) increases cumulative runoff and spill pathways; any exceedance of temporary controls (e.g., during intense rainfall) could undermine RBMP measures and the "no deterioration" duty.

Permanently buried polymeric infrastructure (up to 7,800 tonnes XLPE cables). While XLPE itself is inert in normal service, long-term ageing, mechanical damage, and water-treeing can generate fragments and microplastics; soils are recognised sinks and vectors for microplastics with demonstrated ecological and biogeochemical effects. In a high-water-table, sandy agricultural setting with episodic ponding/waterlogging, any progressive release from damaged sheathing or decommissioned cables left in situ could contribute to diffuse pollution loads to drains and shallow groundwater—antithetical to DWPA objectives to avoid deterioration and reduce treatment burdens. (This mechanism warrants a precautionary assessment given the volumes proposed.)

Some of the Sources studied


The Journal of Engineering

Session – Poster AB | Open Access

Influence of temperature on the growth characteristics of water tree in XLPE cable

Tao Wenbiao, Song Shuyong, Zhang Wei, Bai Rui, Duan Weinan, Wang Wei

First published: 13 February 2019 | https://doi.org/10.1049/joe.2018.8844 | Citations: 4

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Abstract

In order to understand the characteristic of water tree growth for cross-linked polyethylene (XLPE) at different temperatures, here, a new possible explanation is presented for the different characteristic at different temperatures. Water tree aging experiments were performed, respectively, at 0, 20, 40, and 60°C. The shapes of water trees were observed by an optical microscope, and the sizes of water trees at different temperatures were recorded. Based on the molecular dynamics and polymer orientation, the new possible explanation for the characteristics of water tree growth is proposed at high or low temperatures. According to the experiments, the rate of water tree growth first decreases and then increases with the rise of temperature and the transition temperature is about 40°C. The behaviours of thermal motion and orientation of molecules can both influence the water tree growth. The water tree growth at high temperature is mainly determined by the thermal motion, while the water tree growth at low-temperature is mainly affected by the behaviour of molecules orientation.

1 Introduction

Cross-linked polyethylene (XLPE) cable has been widely used in power grid because of its excellent electrical and mechanical properties. Some partial defects may be produced in cable insulation in the process of manufacturing, construction, and operation [1-4]. The electric field can be distorted around defects, which may lead to water tree growing. When the cable is subjected to operating or lightning overvoltage, electrical trees may be initiated around water tree tips and the cable insulation can be damaged permanently [5-8].


Review of water treeing in polymeric insulated cables

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Abstract

Since discovering the water treeing phenomenon (WT) in polymeric cables in the early 1970s, water treeing has been extensively studied. Historically, different theories were proposed to describe this phenomenon's mechanism. The two most prominent theories link the initiation of WTs to (i) mechanical damage and (ii) Stress-induced electrochemical degradation (SIED). Additionally, different investigations in the past have shown that the water trees growth is correlated to different operation conditions e.g. voltage, frequency and mechanical stresses. This paper aims to review the two prominent water treeing initiation theories. Then, discusses the factors influencing the water tree growth.

1. Introduction

Since the 1960s, extruded cross-linked polyethylene (XLPE) has conventionally been used as insulation for HV cables laid in wet environments [1]. Only a few years after deployment, such cables were reported to have a high failure rate. Further investigation revealed water ingress into the insulation, which causes tree-like water structures that leads to insulation breakdown [2]. Fundamentally, there are two types of water trees depending on the shape, namely: bow-ties and vented water trees. Typically, vented water trees are observed to start growing from either the conductor or the insulation screen whilst bow-ties are scattered around within the insulation. Example of typical water tree observations are shown in fig. 1.

challenging to determine or agree upon particular water treeing initiation mechanism, it is generally accepted that during the cable lifetime, the insulation system is subjected to different aging factors that can contribute to the initiation and growth of water trees and eventually lead to the breakdown of the cable insulation system.

The mechanisms involved in water treeing initiation and growth are of complex nature. Thus, it is difficult to categorize different factors based on their contribution either on the water tree initiation or growth specially when different factors can coincide leading to presence of water trees. In this paper, the water treeing mechanisms are presented either as an initiation or growth mechanism based on the convention set by the authors of earlier work.

2. Water migration in polymers

Since polymers are inherently not watertight, the ingress of water into the insulation is inevitable. The water ingress into polymers can be characterized using Henry's law in conjunction with Fick's law for the diffusion of water in the bulk polymer [4]. First, Henry's law states that the water concentration $\rho_{(w,s)}$ at the polymer surface is proportional to the water vapor pressure above the surface $p_{(w,s)}$ i.e.

$$\rho_{(w,s)} = S \cdot p_{(w,s)} \quad (1)$$

where S is the solubility coefficient for water within the polymer.

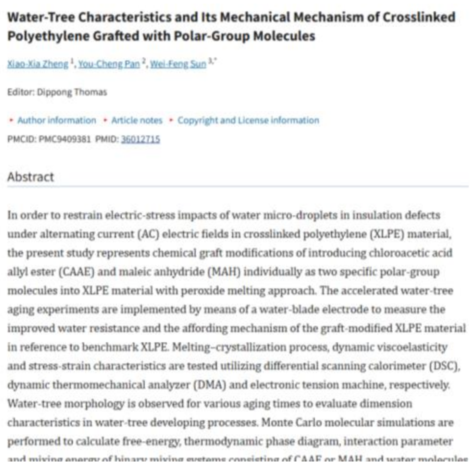
Then, Fick's law states that the water mass flux by diffusion j to be proportional to the diffusing species concentration gradient ($\nabla\rho$) i.e.

$$j = -D \cdot \nabla\rho \quad (2)$$

where D is the diffusion coefficient.

The temperature dependency can be taken into account

[redacted]


Water-Tree Characteristics and Its Mechanical Mechanism of Crosslinked Polyethylene Grafted with Polar-Group Molecules

Xiao-Xia Zheng [1], You-Cheng Pan [2], Wei-Feng Sun [3,*]

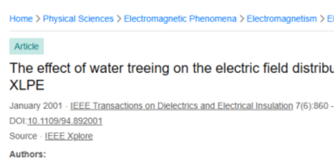
Editor: Dippong Thomas

• Author information • Article notes • Copyright and License information

PMCID: PMC9409381 PMID: 36012715

Abstract

In order to restrain electric-stress impacts of water micro-droplets in insulation defects under alternating current (AC) electric fields in crosslinked polyethylene (XLPE) material, the present study represents chemical graft modifications of introducing chloroacetic acid allyl ester (CAAE) and maleic anhydride (MAH) individually as two specific polar-group molecules into XLPE material with peroxide melting approach. The accelerated water-tree aging experiments are implemented by means of a water-blade electrode to measure the improved water resistance and the affording mechanism of the graft-modified XLPE material in reference to benchmark XLPE. Melting–crystallization process, dynamic viscoelasticity and stress-strain characteristics are tested utilizing differential scanning calorimeter (DSC), dynamic thermomechanical analyzer (DMA) and electronic tension machine, respectively. Water-tree morphology is observed for various aging times to evaluate dimension characteristics in water-tree developing processes. Monte Carlo molecular simulations are performed to calculate free-energy, thermodynamic phase diagram, interaction parameter


Home > Physical Sciences > Electromagnetic Phenomena > Electromagnetism > Electrical Field

Article

The effect of water treeing on the electric field distribution of XLPE

January 2001 · IEEE Transactions on Dielectrics and Electrical Insulation 7(6):860 - 868

DOI:10.1109/94.892001

Source · IEEE Xplore

Authors:

[redacted]

Why this risks failure against specific WFD duties

1. **No-deterioration & good-status objectives (regs. 13–15).** The combination of large hazardous sources (two BESS compounds, 196 inverter/transformer locations), limited on-site containment (“2 hours”), and proximity to surface pathways to a reservoir/intake means that credible single- or multi-point incidents could cause short-term chemical spikes and longer-term diffuse loading, amounting to deterioration or preventing the achievement of good status.
2. **Protected-area (DWPA) objectives.** Article 7/DWPA duties (as implemented) aim to avoid deterioration to reduce required purification at the works. Introducing persistent risk sources inside the DWPA/Safeguard Zone conflicts with these aims unless the applicant evidences that (i) containments are robust for credible worst-case scenarios, (ii) pathways are interrupted in all hydrological conditions, and (iii) residual risk does not increase treatment need. On current parameters (scale; hazardous inventory; limited containment), that evidential burden is unmet.
3. **Regulation 19 (derogation) test.** If the scheme would cause deterioration or prevent achieving objectives, the promoter would need to seek a reg. 19 exemption. They must prove overriding public interest, lack of significantly better environmental options, and full mitigation of adverse impacts. The availability of alternative siting/layouts outside the DWPA/reservoir influence and/or with materially greater containment capacity would make passing the “no better environmental options” limb difficult.

Planning conclusion

Given: (a) siting within a DWPA catchment and adjacent to a reservoir and a water treatment works; (b) the scale of hazardous inventory (two BESS compounds; 196 inverter/transformer units; 7,800 t of buried polymers); and (c) only two hours’ on-site firewater containment, there remains a material risk of deterioration of water-body status and of failure to secure DWPA protection aims. On the evidence base and applicable guidance, the proposal is liable to conflict with the WFD Regulations’ environmental objectives. Any attempt to rely on regulation 19 would need a rigorous alternatives assessment and robust, independently verified demonstration that all feasible mitigation has been incorporated to the maximum extent—standards the current parameters do not appear to meet.

Notes on evidence used: Statutory text and government guidance on WFD duties and regulation 19; official DWPA/Safeguard Zone definitions; solar-farm CEMP exemplars evidencing runoff/spill risks; peer-reviewed and official toxicology on Li-ion fire emissions; and a recent large-BESS incident illustrating real-world containment challenges.

Sources

[redacted]

Examples of development refusals because of pollution concerns in Drinking Water Protected Areas

Ware Park (Bengeo), Hertfordshire — proposed sand & gravel quarry
Ref: APP/M1900/W/17/3178839 (Secretary of State decision) – 12 July 2019
Outcome: Appeal dismissed.
The Inspector and Secretary of State gave determinative weight to risks to the public drinking-water supply. The site overlies a Principal Aquifer and a designated Drinking Water Protected Area. The decision expressly finds an "unacceptable risk to the quality of the public water supply," and concludes this harm is not outweighed.

Law Head Farm, Rossendale — 8 glamping pods
Ref: APP/B2355/W/21/3282615 – 11 July 2022
Outcome: Appeal dismissed.
The Inspector records the site is "within a Drinking Water Protection Area" and finds the appellant's evidence failed to demonstrate no risk of pollution from land contamination associated with the historic water site. The combination of DWPA sensitivity and unresolved contamination risk led to conflict with local and national policy and dismissal.

Our Objections: Incompatible with Drinking Water Protection, future Agricultural Use, and Long Term WFD requirements

We strongly object to the proposed development on the grounds of long-term pollution risk to drinking water protected areas, the River Trent and valuable agricultural land.

The site plan involves leaving thousands of tonnes of plastic-insulated XLPE high-voltage cables buried across over 4,000 acres, alongside the installation of a large-scale Battery Energy Storage Systems (740MW BESS), 1.4 million solar panels, and 196 inverters.

Many of the materials involved—including lithium-ion battery packs, inverters, cable insulation, and solar components—contain or can release hazardous substances during fire, degradation, or accidental damage. These include:

- **PFOS and other PFAS "forever chemicals"**, known to persist in groundwater and linked to cancer and immune system impacts.
- **Heavy metals** such as **lead, cadmium, mercury**, and **nickel**, which are persistent, bioaccumulative, and toxic to both human health and ecosystems.
- **Dioxins**, **polybrominated flame retardants (PBDEs)**, and **carcinogenic PAHs** (e.g., **benzo(a)pyrene**, **fluoranthene**), released during thermal events or via slow cable degradation.
- **Nonylphenol**, **endocrine disruptors**, and **other banned persistent organic pollutants (POPs)**.

Leaving buried plastic infrastructure such as XLPE cables in drinking water protected zones represents a clear **long-term contamination pathway**, in conflict with the Environment Agency's own regulatory advice and groundwater protection guidance. The proposal is therefore inconsistent with national planning policy regarding water safety, soil health, and environmental protection.

We urge the Planning Inspectorate to require full cable removal, prohibit buried plastics in sensitive zones, and to consider refusal of the application if these pollution pathways cannot be adequately mitigated or eliminated.

Yours sincerely

Gill Cobham (on behalf of South Clifton Parish Council)