Outlook

Evidence to Planning Inspectorate regarding Springwell Solar and the Lincolnshire Limestone aquifer. (Interested Party No. 20054658 and 20054656).

From Martin Elvin [redacted]
Date Fri 2025-09-12 18:16
To Springwell Solar Farm <SpringwellSolarFarm@planninginspectorate.gov.uk>
Cc [redacted]

12th September 2025

Dear Sir/Madam,

The Lincoln Limestone aquifer is an important feature geologically, hydrologically and in a social and economic sense also.

The Lincolnshire Limestone is of mid Jurassic age. It consists of a varied series of beds and formations which stretches from the Humber Estuary in the north of the county, southwards to Bourne and Stamford in the south of Lincolnshire, though as a geological feature it continues on south of the county boundary.

The western boundary of the Lincolnshire Limestone and associated aquifer is marked by a scarp slope which is a very significant feature of the landscape in the west of the county. It is sometimes referred to as the Lincoln Edge or simply the cliff; hence the Cliff Villages.

The scarp slope faces to the west, and it is particularly well developed and prominent from a point several miles to the north of Lincoln, and running southwards, past the city of Lincoln, then just to the west of the Cliff Villages of Waddington, Harmston, Coleby, Navenby, Wellingore and Leadenham and so on, south towards Grantham.

From this western boundary of the limestone formation, it dips gently to the east (as does the landscape as a whole) on a gradient of about 1 degree, west to east.

For management purposes, the Lincolnshire Limestone is often divided into three areas, northern, central and southern, based upon geographical, geological and hydrological features,

The area which is the main subject of this submission is primarily the central area. This is the area which includes Lincoln, the Cliff Villages, and to the east of those villages, settlements such as Scopwick, Kirkby Green, Metheringham, Ashby de la Launde, Rowston, Digby and to the south, Ruskington and Sleaford.

It is also the location for the proposed 4,000 plus acres of the Springwell Solar project including solar panels and accompanying battery energy storage system (BESS).

It is additionally the proposed sites of several other BESS installations and the proposed Navenby substation linking all of this to the national grid, in what is a deplorable example of overly cumulative development of industry in a rural, efficiently farmed, agriculturally productive landscape.

The Lincolnshire Limestone formation outcrops upon the surface at the top of the scarp slope pf the Lincolnshire Edge, close to the Cliff Villages. It then dips gently in an easterly direction, down the back slope towards Scopwick etc.

As it dips, it gradually descends beneath a relatively thin covering of loose, sometimes sandy, calcareous, and at times stoney soils of what is sometimes referred to as the Lincoln Heath.

These shallow deposits produce good quality well draining soils, whose productivity and output have been increased over decades through knowledgeable farming methods and use of increased organic matter, thus creating soil improvement.

To the east of Scopwick the soil cover gradually contains more in the way of clay particles and minerals. Again, good quality fertile agricultural farmland.

Eventually the limestone dips gently deeper, until it becomes confined under the younger deposits that constitute the fenlands. But that is well to the east of the proposed site for Springwell.

The limestone formations are vertically divided into the Upper and Lower Lincolnshire Limestone.

The beds of the Upper (younger) formations are mainly course, gritty, shelly oolitic limestones. They vary in colour from creamy to buff to honey coloured. The beds of the Lower (older) formations are finer grained than those above and are shades of grey in colour.

It is this readily permeable and very porous limestone, particularly in the upper beds, which gives rise to the existence of the Lincolnshire Limestone aquifer.

The limestone formations act like a gigantic sponge, thus producing a vast underground reservoir of water stored in the pores, throughout the body of these rocks.

The water stored within the aquifer is not static. There is a general very slow movement down the gradient west to east. But there are additional currents caused by fractures within the rocks, natural springs and borehole abstraction.

The Lincolnshire Limestone aquifer is a significant natural feature which also has great importance from a human, social and economic point of view.

Large volumes of water are abstracted from the aquifer, particularly (though not exclusively) in the central area, via boreholes.

Large parts of the south of Lincoln and also in the Sleaford and surrounding area, are dependent upon the aquifer for domestic and business water supply.

According to the British Geological Survey and Environment Agency (BGS/EA) joint publications, Baseline Series No.23, “nearly 80 percent of total licensed abstraction is for public water supply. Much of the abstraction for public water supply occurs in the Sleaford area.” This area is within 8 miles of the proposed Springwell site.

Abstraction for public water supply is not exclusively in the Sleaford area, with boreholes for public water supply being sunk
into the aquifer in the central area at various locations even closer to the proposed Springwell site.

The BGS/EA Baseline Series report also states that, “Nearly 10 percent of licensed abstractions in the area are for spray irrigation and almost 9 percent of the total licensed abstractions are for industrial use.
Farms form the bulk of the other licensed abstractors of groundwater in the region,”

The condition, now and in the future, of the water in the aquifer is clearly of major importance, with regard to public supply, as ultimately most of this goes for human consumption in one way or another.

The agricultural and farm related abstractions are of major significance as they are for irrigation and crop production mainly, and therefore have an influence on the human food chain.

Summertime weather in central Lincolnshire tends to be predominantly, relatively warm and dry by UK standards. It is estimated that around 80 percent of the annual amount of water lost from the aquifer occurs in the summer months as a result of evapotranspiration. At the same time there is increased rates of abstraction for agricultural and other human consumption at that time of year.

(To be clear, the above figure does not mean that 80 percent of the aquifer is lost, only that the above percentage accounts for that proportion of water that is lost, the actual amount of which will vary from year to year.)

The BGS/EA Baseline report explains that the primary source of water recharge of the Lincolnshire Limestone aquifer, is the winter rainfall. That is highly significant for a number of reasons.

Average annual rainfall for this part of central Lincolnshire varies from 600mm (24inches) per annum at the base of the scarp slope, to 650mm (26 inches) at the crest of the scarp or edge. This is low average rainfall compared to average rainfall levels for the British Isles as a whole.

Apart from summer downpours and thunderstorms on occasion, the vast majority of rainfall during an average year in these parts, occurs in the late autumn and winter months.

The recharge of the aquifer by rainfall is facilitated in the area of the Lincoln Heath and nearby by the well draining soils and the readily permeable underlying limestone.

The fact that this recharge is dependent upon the rainfall, means that any pollution or contaminants on the surface or within the soils, which are carried into the aquifer will not be offset by any uncontaminated waters ingressing from elsewhere.

The fact that average annual rainfall hereabouts is relatively low, means that any pollutants or contaminates will be diluted to a lesser extent than in areas where average annual rainfall levels are higher.

Importantly, the BGS/EA Baseline report states that, “The nature of the aquifer, coupled with the thin soil cover over the outcrop area means that it is vulnerable to pollution from the surface.”

The area being referred hereto by BGS/EA, includes precisely that where Springwell’s developers are proposing to site their solar panels and BESS facility across 4,000 acres or more.

To provide a wider picture, the BGS/EA report explains, “Land use is dominated by farming, although there are some industrial areas present around the larger urban areas of Lincoln, Sleaford and Grantham. The aquifer is fractured and travel times (for water) can be very rapid.”

The report continues, “The greatest current impact is from diffuse sources, predominantly nitrate and pesticides from agricultural activity. The unconfined Lincolnshire Limestone aquifer currently faces problems with high nitrate concentrations.”

The report explains that, “Point source pollution from industrial activities, waste disposal and spills can have a devastating effect on individual abstractions.”

The aforementioned comments from the BGS/EA report are unhappy and unwelcome news and certainly need to be addressed and solutions found.

It is essential that the serious environmental damage that has been inflicted upon the country’s rivers and waterways is not allowed to be repeated in the Lincolnshire Limestone aquifer, or any other aquifer within the British Isles.

Fortunately, nitrates, as unwelcome as they are in waters used for public supply, will in many cases break down into less harmful substances, and be reduced in concentrations as a part of the natural processes of the nitrogen cycle.

Similarly, the presence of pesticides in the aquifer, with the prospect of those substances entering the public water supply is highly undesirable.

Given the present problems of pollution of the aquifer caused by traditional uses of the land, the proposals to site a massive solar facility poses the threat of a whole new set of potential pollutants leaching into the soil and

aquifer. Some of these chemicals and substances are already causing concern because of their presence in water and soils, their persistence and longevity and the health problems which they are believed to cause.

Point source pollution from industrial activity, from waste disposal and spills is not only devastating. In cases where it's as a result of poor practices, breaches of regulations and/or avoidable mishaps it's deplorable. Sometimes with a timely response the pollution can be confined to the immediate vicinity of the incident and further pollution prevented.

But the massive solar development being sought by Springwell, across 4,000 acres involving materials, equipment and methods which are unclear and over a timescale of decades poses a grave threat and serious risk to the Lincolnshire Limestone aquifer.

It's worth looking at the subject of a planning application received at North Kesteven District Council planning department in 2009. (Ref. 09/1040/FUL)

This was a proposal to build an indoor, so called "super dairy" for 800 head of dairy cattle at Nocton some 6 miles north of Scopwick.

There were numerous objections lodged by members of the public, many on grounds of concern about animal welfare of the cattle involved, and the proposal was withdrawn.

The Environment Agency also lodged an objection to the development on grounds of concern for the welfare of the Lincolnshire Limestone aquifer arising from the large quantities of waste materials that would be produced by the operation of the proposed dairy.

In the opening paragraph of their comment dated Tuesday 9th March 2010 the EA states, "We OBJECT to the application as submitted because the applicant has not supplied adequate information to demonstrate that the risks posed to ground water can be satisfactorily managed."

With regard to the EA's opening comment, it is applicable to the Springwell applicant's approach. There is insufficient cognisance by them of the importance of the Lincolnshire Limestone aquifer, of the significance of it as a natural and a social human resource, of its role as a source of water and of its close proximity to the surface across much of the proposed Springwell site. The developers/applicants haven't supplied adequate information to demonstrate that the risks posed to groundwater can be satisfactorily managed.

The EA's objection of 9th March is lengthy and detailed. Although the potential contaminants are different from those potentially associated with the proposed Springwell Solar development, nevertheless some of the principal points and some of the details are broadly applicable to this present DCO application.

Locally, and more widely, there is presently a lot of discussion and concern about the level of risk of pollution and contamination which would result from any decision to permit the construction of Springwell. This concern is with regard to the methods of construction employed and the materials from which it would be made. Concerns about those materials extend to their long term use and the effects upon them as they deteriorate over time. The potential for all of the above to pollute and contaminate the soils and damage the quality of the groundwater is a concern keenly felt,

At one point in their objection of 9th March 2010 the EA explain that, "In implementing our policy we will oppose development proposals that may pollute groundwater especially where the risks of pollution are high and the groundwater asset is of high value."

There is no doubt as to the high value of the waters of the aquifer, lying below the site of the proposed Springwell facility and its associated BESS.

The Environment Agency then spells it out thus,
"We consider that the risk to groundwater is unacceptable because:
"The development lies directly on a Principal Aqifer. It also lies within a Source Protection Zone SPZ I inner zone and a SPZ ll outer protection zone, which is associated with a public water abstraction within 2km of the site. Due to this, the groundwater is particularly sensitive at this site and must be protected from pollution."

As with the Nocton dairy, likewise the Springwell solar facility's proposed site of development lies on what the Environment Agency describes as a Principal Aquifer.

The settlement at Scopwick and surrounding
country is within a Source Protection Zone. Details of this are shown in a map of the area which appears on page 93 of the Scopwick and Kirkby Green Neighbourhood Plan 2021 - 2036.

Furthermore, the aforementioned borehole (at Dunston) for abstraction of a public water supply is only some four miles distant from parts of the Springwell development as proposed.

Later the EA comments, "The applicants have not satisfactorily demonstrated that the works will not lead to a deterioration of the groundwater quality of the Limestone, or impact the public water supply borehole."

Likewise, it's not clear that the Springwell developers/applicants have recognised the need to consider the potential impact of their proposals upon the quality of the groundwater of the Lincolnshire Limestone.

The EA further states, "The risk is partially a function of the depth of the excavations as stated in section 10.7.3 (of the Environmental Statement or ES) but is also dependent upon the mobility and properties of the contaminants. Soils are shallow and excavations of some of the more significant infrastructure will be directly into the Lincolnshire Limestone which is a Principal Aquifer."

As with the dairy proposal at Nocton, the depth of the proposed excavations for the Springwell solar project is a major factor which needs to be properly considered before any possibility of planning consent.

Given its proposed siting, any development associated with Springwell could be into soils even shallower than those at Nocton.

This is because Springwell's proximity to where the limestone outcrops to the west, is closer to that point than is the situation at Nocton, which is further east, and where therefore, the soils are slightly less shallow and the limestone slightly deeper, given its west to east 1 degree dip around these parts.

In addition, the sheer quantity of excavations
required to anchor into the ground, the posts needed to support the number of solar panels across 4,000 acres will be enormousl.

If, as believed, the preferred means of securing the panel support posts into the ground is by use of concrete, then the sheer volume of said material on such a scale is an additional cause for concern with regard to the aquifer.

Concrete is considered to be a contaminant under certain conditions, and when used on the scale that would be required as described above, for the proposed Springwell Solar project, would pose serious risks to the aquifer and to associated groundwater.

When pouring concrete in its 'liquid' or 'wet' state into the many excavations across the proposed Springwell site, there is the potential for this substance to come into contact with the groundwater, to then enter the aquifer and thus cause contamination of same.

In its solid or 'set' state, where the concrete is buried beneath the surface, it would be subject to interaction with the surrounding soil and groundwater.

The Environment Agency published guidance on 23rd October 2024 entitled, "Treating and using water containing concrete at construction sites: R287."

Although a part of that guidance may not be entirely relevant to the Springwell solar project at present, it may well have some relevance to the situation with regard to the limestone aquifer underlying the proposed site.

The EA in their advice, are not specific as to the levels or concentrations of concrete pollution within the water

to which they are referring. But what is clear, is that they regard the contamination of water by concrete, as a hazard which needs to be controlled.

It is essential to bear in mind the widespread nature of the Springwell site, above the limestone aquifer, the very large number of individual excavations and each to be filled with concrete.

When said concrete is poured into each hole, when still in its wet state, and comes into contact with groundwater, it is entirely feasible to envisage multiple point sources of contamination and pollution as a result of the above situation, leading to it having a cumulative effect upon the groundwater and the aquifer.

Once the concrete has set, over a period of time, at the interface between the concrete and the soil and groundwater, there is the potential for deterioration and breakdown and the leaching of substances within the concrete, into the soil, the groundwater and the aquifer.

To summarise, several factors need serious consideration, with the above proposed construction.

Firstly there is the enormous size of the proposed development in terms of the acreage, the number and depth of the excavations and the vast quantities of concrete involved.

Secondly, the shallow nature of the soils overlying the Lincolnshire limestone aquifer and the porous nature of said limestone.

Thirdly there is the elevated nature of the groundwater in many places across the area of the proposed development. This means that at certain times of the year, particularly during the winter and spring, sometimes even into early summer, following the seasonal rainfall/snowfall which recharges the aquifer, groundwater levels can be less than two feet below the surface.

Indeed, in places and at times, groundwater may be that close to the surface, that even the shallowest of holes quickly fills with water.

Linked to the third factor is the fourth one; namely that there are numerous springs across the area of the proposed development and beyond. These springs are the sources of becks and streams, whereby the water literally springs from the limestone aquifer, producing clean, clear watercourses.

These becks and streams have a geology and a hydrology and support a flora and fauna which is closely akin to that of the chalk streams of eastern and southern England ; of which 70 percent of the world's such streams are found in the above area and which are designated as of international ecological and scientific importance.

Leachates from concrete, finding their way, via the aquifer, into those streams, would pose a serious threat to the water quality and as a result, the ecology of those watercourses.

The fifth factor (last but not least) is about the human, social and economic aspects. The aquifer is a major source of good quality water for public supply to homes and businesses across a large part of central Lincolnshire.

It also provides a significant supply to agriculture across this area, including for crop irrigation. Some abstraction occurs for industrial uses too.

Pollution and contamination of this major water resource, described by the Environment Agency as a "Principal Aquifer"would be, potentially disastrous.

For all of the abovementioned reasons, as interested parties we object to Springwell"s application for Development Consent Order and call upon the Planning Inspectorate to refuse permission for same.

Sources.

1). Baseline Report Series

23. The Lincolnshire Limestone.
Published by British Geological Survey
and Environment Agency 2006

2). North Kesteven District Council Planning
Department. Planning application Ref.
09/1040/FUL. Environment Agency"s comments of 9th March 2010.

3). Scopwick and Kirkby Green
Neighbourhood Plan 2021 - 2036.

4). Treating and using water containing
concrete at construction sites: R287.
Published by Environment Agency on
23rd October 2024.

It is intended that further concerns will be submitted by the 23rd September 2025 deadline, to add to those within this submission, with regard to additional substances and materials with the potential to cause contamination and pollution of the Lincolnshire Limestone aquifer as a result of Springwell"s proposals.

Thanking you in anticipation of your interest in and attention to the concerns raised and the objections lodged herein.

Elvin

[redacted]

numbers (respectively)
0054656.

Outlook

Evidence to Planning Inspectorate

From Martin Elvin [redacted]
Date Wed 2025-09-24 00:01
To Springwell Solar Farm <SpringwellSolarFarm@planninginspectorate.gov.uk>
Cc [redacted]

Dear Sir/Madam,

This submission to the Planning Inspectorate is intended to be taken in conjunction with a previous one lodged on 12th September 2025.

That, previously submitted one was primarily concerned with the Lincolnshire Limestone aquifer, its structure and features, and the threat posed to it by contamination and pollution emanating from the proposed Springwell solar project.

One particular potential source of contamination and pollution to the Lincolnshire Limestone aquifer and to the land, the soil and the groundwater thereabouts, is a group of organic chemical compounds referred to as PFAS chemicals.

There is a strong probability that materials containing PFAS chemical compounds will be used in parts of the solar panels which the Springwell developers are proposing to install on a mass scale across some 4,000 acres of rural central North Kesteven, above the aqifer.

The term PFAS is an abbreviation which stands for both perfluoroalkyl and/ or polyfluoroalkyl. (The S indicates the plural because there is a group of these compounds).

The name (or names) reflect the chemical composition and chemical structure of the molecules of these organic compound substances.

The compounds consist primarily of the elements carbon and fluorine. The carbon atoms are arranged in chains, varying in length from one PFAS compound to another, depending upon which one it is.

The alkyl part of the collective name for these substances is a reference to the carbon-fluorine chain which forms the backbone of every molecule of a PFAS compound.

The difference as to whether these substances are classified as per- or polyfluoroalkyl, is the presence, or not, of hydrogen atoms within the molecular structure.

Peralkyls have only fluorine atoms bonded to carbon atoms along the chain, whereas in polyalkyls, as well as the all important carbon- fluorine bonds, at points along the chain, a hydrogen atom will bond with carbon in place of the familiar fluorine atom.

Small numbers of atoms of other elements occur in the molecules of PFAS substances, varying from one such substance to another and producing some variations in the properties of said substances.

In both versions, (per- and/or poly) the most significant characteristic is the presence of a very strong chemical bond between each and every one of the fluorine and carbon atoms.

This produces compounds that have properties which include being chemically very stable, being chemically non reactive and therefore resistant to chemical breakdown over long periods of time.

PFAS substances form a large family or group of chemicals, the exact number of which varies from one report or publication to another, but numbering thousands.

They are synthetic or man made organic compounds which have been developed to fulfil a whole range of useful tasks and functions due to their properties.

They are widespread in their uses, and also in their presence in both the human sphere and the natural world.

With their usefulness and benefits, however, has come serious concerns about their potential to cause damage to health and the environment.

Significantly PFAS chemicals and substances have come to the attention of the Drinking Water Inspectorate (DWI) and the Environment Agency (EA).

In last year's annual report, entitled "Drinking Water 2024" the DWI included a section entitled, "Perfluoroalkyl and polyfluoroalkyl substances (PFAS)"

At risk of some repetition, it is, nevertheless, well worth quoting some of this section of their report.

They state, "PFAS are a group of man made compounds, the basis of which are chains of carbon and fluorine atoms."

They state further, "The carbon-fluorine bond is very strong, so these compounds do not degrade easily in the environment."

The report continues, "They are resistant to grease, oil, water and heat and so they have found a large range of uses, for example in stain and water resistant fabrics and carpets, as well as in paints and fire fighting foams, cookware, and food packaging."

The DWI report for 2024 explains that, "The production of these substances, their use in products, and their use and disposal means that they are now found widely in the environment throughout the world."

"Ultimately because of the persistence of the substance they are eventually found in water, be that groundwater or surface water." so states the DWI Annual Report for 2024.

An article on the DWI's online home page posted in 2024 is entitled, "PFAS and Forever Chemicals"

In this article the DWI explains, "PFAS (per- and polyfluoroalkyl substances) is a chemical family consisting of at least 5,000 individual substances. They are sometimes referred to as 'forever chemicals' because of their persistence in the environment."

The DWI produced a further report in 2024
entitled, "Guidance to water companies."
In section 2 headed, "Background " paragraph 2.1 explains, "Due to the strength of the carbon-fluorine bond, PFAS do not readily degrade in the environment. PFAS are highly mobile in air, water and soil and can accumulate in humans and wildlife."

In paragraph 2.3 of the DWI report is the following statement, "Documented potential health outcomes of PFAS studied include reproductive effects including reduced fertility; developmental effects in children such as low birth rate weight; increased risk of some cancers including prostate, kidney and testicular; and a reduced ability of the body's immune system to fight infection."

In August 2021, the Environment Agency published a report with the title, "Poly- and perfluoroalkyl substances (PFAS): sources, pathways and environmental data."

It is clear from the EA report, that knowledge about PFAS chemicals was still developing then, as remains the case today.

Nevertheless, they point out that, “The length of the fluorinated carbon chain can result in different physiochemical properties that influence the substance’s behaviour in the environment and its bioaccumulation and ecotoxicity.”

They EA report.on this subject continues, “Long chain PFAAs are typically more bioaccumulative and toxic than short chain homologises. Short chain PFAAs tend to be more mobile in the environment with a greater tendency to reach groundwater.”

As the EA’s report points out (still on page 9),
“Many PFAS, especially those with shorter perfluoroalkyl chains, are also highly mobile in water, so can travel a long way from the original source and gradually accumulate in groundwater. In addition uptake into plant tissue can be significant, which can lead to contamination of crops.”

The Environment Agency’s report (p.9) further points out, “Some PFAS can also remain in mammalian tissue for a long time. Field studies have established that this can lead to increasing concentrations up the food chain.”

When considering the effects upon the health of people, arising from the above concerns, the EA comments, “A recent review of PFAS toxicity and impacts on human health by Fenton et al (2020) summarises the current state of knowledge and reports an association, demonstrated through epidemiological studies, between some PFAS and a variety of health impacts including altered immune and thyroid function, liver disease and adverse reproductive and developmental outcomes.”

There are a couple of further points from page 9 of the EA’s report, worthy of serious consideration under the circumstances of this submission.

One such paragraph states that, “Standard wastewater treatment processes that rely on biodegradation or sorption of sewage sludge are not able to remove PFAS from wastewater. This means that PFAS can enter the environment and remain there almost indefinitely, leading to long-term continuous exposure of people and wildlife,”

Whilst the first sentence of the above paragraph does not relate directly to the situation with regard to the proposed Springwell solar project and the underlying aquifer, it is included purely for reasons of context.

The second sentence of said paragraph with regard to the longevity of PFAS substances within the environment and the resultant threat to people and wildlife may well be highly significant in relation to Springwell’s proposals.

A following paragraph from the EA report explains, “Even if a source of PFAS to the environment is stopped, PFAS concentrations will decline very slowly. The long history of use of some PFAS means that there is a legacy of presence in the environment that is very hard to remediate.”

The aforementioned (in this submission) chemical and physiochemical properties and structure that give rise to the characteristics associated with PFAS substances within, have led to their widespread and varied industrial, commercial and consumer uses.

These characteristics include resistance to chemical degradation, and as a result they have durability, persistence and longevity in use.

Further PFAS are water repellent, oil and grease repellent, heat resistant (to relatively high temperatures), and also have the ability to reduce light reflection from surfaces.

PFAS substances can function as surfactants, giving them the ability to reduce the surface tension that exists within water droplets on a hard surface, such as glass; thus causing water to disperse more readily and encouraging evaporation to occur more rapidly under the right conditions.

Surfactants, when included in the ingredients of soaps and detergents, can improve the cleaning effectiveness of those cleaning materials when said materials are mixed with water.

They do so by acting at the interface between the surface to be cleaned and the surface of the unwanted substances to be washed or cleaned off.

PFAS substances also have ‘non-stick’ properties which are useful not only on the surfaces of cookery ware in order to prevent food sticking to pots and pans. But similarly, such substances can be applied to hard surfaces such as painted metal or panes of glass to, to prevent dirt from adhering to them.

It should be understood that not all of the above properties and or characteristics are applicable to each and every PFAS substance, but all of them are to be found somewhere across the thousands of compounds which comprise this large group of chemicals.

Without doubt, many of the properties and characteristics associated with PFAS substances would be very useful if and/ or when they were applied to solar panels,

In particular those PFAS materials which increase durability and longevity would be useful, given the year round exposure to the elements which solar panels would be subject to over a forty year period as developers such as Springwell are
proposing.

Those PFAS substances used at present in the electronics industry for coatings of components, may well be of interest to the manufacturers, purchasers and the operators of mass solar projects.

PFAS substances designed to reduce reflectance of light, and thereby maximise the amount of light energy reaching the photovoltaic cells, would be an advantageous.

The range of PFAS based surfactants available would offer a number of advantages if employed in the manufacture of solar panels. In particular with regard to the dispelling of water droplets from the top transparent sheet of each solar panel, thereby increasing the rate of evaporation of water from those surfaces, thus ensuring maximum transparency to allow light energy to enter the pv cells.

These PFAS based surfactants could play a role in providing ‘non-stick’ surfaces to prevent a buildup of soiling and grime, all of which would otherwise reduce the sunlight energy reaching the pv cells and thus reducing electrical production.

PFAS based surfactants in detergents and other cleaning materials could help to provide easier, more efficient and effective was to clean/ remove grime, soiling and dirt from solar panels and help to reduce the rate at which it might accumulate after cleaning.

Much of the content of the past paragraphs regarding the possible application of PFAS substances to uses on solar panels may seem somewhat speculative.

But this is because fully accurate information from authoritative sources, is as yet, hard to come by where the manufacture of and the materials and substances used within solar panels is concerned.

There are conflicting reports about the presence or otherwise, of PFAS substances in solar panels in general.

From the general to the particular, so far as the developers who are proposing the Springwell development are concerned, their choices of solar panels is not clear.

There are growing concerns about the contamination and pollution caused by decades of production and use of PFAS chemicals as illustrated by the extensive research being conducted by the DWI and the EA.

Alternative, substitute substances are being sought, but as yet such alternatives have not been found to fill every role and where they have been found they are not always as effective.

On this basis we repeat our objection to the proposed Springwell Solar project.

[redacted]

Yours faithfully
Martin and Sue Elvin.