From: [redacted]
To: East Anglia ONE North; East Anglia Two
Cc: [redacted]
Subject: Richard Reeves D7 Submission
Date: 04 March 2021 18:36:28
Attachments: D7 Submission.pdf

Richard Reeves, AP EI1N AFP 133 / IP 2002765

Dear Inspectorate panel,

Please find attached, pdf of my D7 submission, in response to the Applicant's Landfall Hydrogeological Risk Assessment.

Many thanks once again for reviewing my submission.

Take care and stay safe,

Kind regards,
Richard Reeves

Sent from Mail for Windows 10

Richard Reeves, AP EI1N AFP 133 / IP 2002765

Responses, Questions, Corrections

RE The Applicants' Landfall Hydrogeological Risk Assessment 24/02/2021

Referred to below as LHRA

General Comment:

For APs and IPs, the interval of merely a few days in which to digest and respond to the Applicants' D6 LHRA desktop survey compilation is not adequate. Further detail and corrections to both factual claims and interpretation of data on the part of the Applicants will be added prior to, and at, D8, and in forthcoming ISHs.

Specific Initial Responses, referencing LHRA statements.

Quotes from the Applicants' LHRA submission are in *italics*

3 Proposed Works

10. *The landfall HDD bores are likely to be located north of Thorpeness (approximately 750m south of the Wardens Trust site) with planned lengths of up to 2000m.*

12*. The pilot hole will be steered and surveyed using a wireline guidance tool located behind the drilling bit. The HDD will be at approximately 11m below the base of the cliffs along the coast …*

The distance quoted from Wardens site of landfall HDD bores is noted, although later in the same document a different, an even shorter, distance is quoted. In my previous submission I estimated the distance to be 1200m. The effect of this on my previous calculations regarding the depth below surface of the aquifer / water bearing stratum is to decrease its subterranean estimated depth, based on these recent actual measurements:

To refresh memories from y D6 submission:

" … the rest water level, ie the surface of the water in the well at Ness House, lies at no more than 2.1 m / 7ft above sea-level (calculation being ground elevation @13.8m minus depth below ground-level of surface of aquifer @ 11.7m) At the proposed Landfall point, the cliff edge at Thorpeness Point, this same differential between elevation above sea-level of ground surface and rest water level of the aquifer below ground surface, (6.3m minus 11.7 m) would place the aquifer at 5.4m below sea-level at the foot of the cliff / top of the beach. Again in my previous submission at Deadline 4, in the description of the Suffolk Chalk Aquifer quoted from Natural England, the chalk layer containing the aquifer waters is described as lying on a gentle slope, running downward from NW to SE of the region, to continue its trajectory under the bed of the North Sea. The angle of this slope can be reasonably estimated by comparing the above / below sea-level figures quoted above, namely 2.1 m above sea-level at Ness House, sloping down by a net fall of 7.5m in the

course of the approximately 1200m distance between Ness House and the proposed Landfall point, a gradient of 0.625m in 100m / 0.006 in 1."

In short, given the much lesser distance from Wardens / Ness House quoted, the very slight gradient of the aquifer has a much lesser opportunity to have effect, and the aquifer is therefore lying at an even shallower level of elevation than estimated in my previous submission. Thus, the assumed depth of the rest-water in the aquifer at the cliff-base adjacent to Landfall must now be taken to be significantly less than the 5.4m previously used in my calculations.

The Applicants' confirmation of an even greater depth of drilling level at the base of the cliffs – 11m as opposed to the 3m assumed in my previous calculation, is also noted. At such a depth, the Applicants themselves now confirm that drilling through the water-bearing strata that contain the aquifer is unavoidable, as will be drilling through the aquifer for a second time, from below, when rising through sea-bed strata to the "punch-out" point.

15*.The HDD is expected to be within the Coralline Crag beneath the cliffs, and the strength of the Coralline Crag is expected to prevent any drilling fluid breakout at this point*

Over the whole course of these examinations the Applicant has gone to great lengths, from live hearings, through live and written consultations with Aps, Ips, and other residents, and in response to urgent queries for clarification from EDF, to demonstrate its assertion that the integrity of the coralline crag will not be compromised by the planned HDD works. Now, at this late stage of the Examinations, it is suddenly revealed that the HDD bore will in fact pass through the coralline crag. Furthermore, the Applicant is now relying absolutely on the (previously accepted as fragile) coralline crag to provide stable insulation against fluid loss. So, after going to such great lengths to assert that the coralline crag would be avoided, due to fragility, now it is apparently to be relied on, and bored through, because, at the tap of a desk-based key-stroke, it is convenient to describe it as being super-strong. It very much seems that this is yet another example of the Applicant simply attempting to bend reality to suit whatever its latest argument demands. Super-strong, or fragile – which is it?

4.1 Geology

21*The basal Chalk bedrock dips gently to the south-east, as do the Palaeogene strata which overlie it. In the east of the area, the Pliocene and Pleistocene Crag deposits dip eastward (Environment Agency, 1997).*

22. *Existing BGS boreholes surrounding the landfall (see Figure 1 in Appendix 1) indicate that the London Clay is at approximately -50m Ordnance Datum Newlyn (ODN). However, this differs to the base of Crag contour map shown on the 1:50,000 series published map, which shows the base of the Crag*

In referencing London Clay at this depth, and the existence of a chalk layer underlying it, the Applicant seems to be suggesting that the non-porous nature, and extreme depth of the clay seals the chalk layer from any possible damage or

pollution from the DHH process. While this is true, it is of no relevance. Having seized on the word “chalk”, in connection with the aquifer, the Applicant implies that as there is a single basal level of chalk below the clay that contains the aquifer. However, as the Applicant admits, in the previous paragraph

20 *In East Anglia, drift deposits are variable, including pebbly sand, gravels, silts, and clays. A chalky till, known as Lowestoft Till covers much of the area*

Whether in Lowestoft Till, Red Crag, or a mixture of both combined with chalk, the aquifer does not lie under the London Clay layer referred to above. The numerous ponds, wells, and boreholes within the area of the works all attest to the fact that the feature we refer to as “the aquifer” – a vast underground lake or reservoir – lies very near the surface. Whether the HDD process does or does not penetrate the London Clay level at -50m is therefore of no consequence. By the time the drill-head reaches 11m below ground at cliff base, on its way to bore through the coralline crag (Applicant’s own plan, please see above) it will already have passed through the aquifer-levels responsible for widespread water supply. Hence the seemingly much vaunted paragraph:

23 *Pre-construction ground investigations will confirm the true depth to the London Clay, however, unless it is significantly shallower than expected, the HDD will not be drilling within the London Clay*

- far from demonstrating that the HDD process will leave the aquifer levels unaffected because the London Clay will not be impacted, in fact only serves to underline the fact that the water-bearing mix of till, crag, and chalk above the London Clay will be unavoidably compromised.

4.2 Hydrogeology

25 *The Crag and the Chalk are designated by the Environment Agency as ‘Principal Aquifers’, which can provide a high level of water storage and support water supply and base river flows on a strategic scale. However, In the study area, the Chalk groundwater below the London Clay is highly saline and potable supplies are taken only from the Crag.*

Again, the chalk groundwater below the London Clay is of no relevance as it is from the levels above the clay that drinking water is extracted or collected. It is noted that these upper levels of mixed crag are classified as a “Principal Aquifer”

30 *It is understood that the Ness House well is located in a locked building within the bounds of the property over* ***400m*** *north of the likely location of the HDD bores. The well supplies five properties at and around Ness House, including Wardens Trust.*

My bold emphasis above – earlier in the document 750m was quoted. One wonders what figures will be plucked out of the air next by the Applicant. Ness House, Wardens, Ilex House, Ness House Cottages are at the same location. The locked building referred to is in the courtyard of my home. All of this would have been clear to the Applicant had their representatives attended the recent site visit to which they had been cordially invited.

4.3 Hydrology

31 *The landfall is not located within a catchment of any permanent surface water features and could only be affected by surface runoff.*

Again, are we to assume landfall is at 400m, 750m, or another as yet unspecified distance from Wardens / Ness House site? And the extent of landfall, predicted to require plots 4, 10 12, 13, 14 amongst others, remains unspecified as to total land area required. In terms of the statement regarding permanent surface water, this is factually inaccurate. Plots 4 and 12 contain permanent ponds, where aquifer-supplied water table sits just below ground level, and there are several boreholes and taps located in these areas which testify to permanent surface or near-surface aquifer presence. Again, had the Applicant attended the site inspection referred to above, it could have witnessed these features, rather than rely on inadequately informed speculation.

34 Table 4.2

The table is factually inaccurate in that it fails to represent multiple species of protected flora and fauna present in all the areas it reports on:

Some examples:

In Important Hedgerows 3 and 4 (scheduled for demolition) and the associated hedgerows linking and bordering plots 10;12;13;14 more than 40 species of wild flower have been recorded (cf my earlier submissions which include species recorded by Wardens volunteers and trustees over several decades). Amongst these flora are Red Valerian; Honeysuckle; Petunia; Sloe; Hawthorn; and numerous nectar-rich flowers. The species I name here are of particular relevance to several rare and protected species; three examples: the Hummingbird Hawk Moth; Lampyris Noctiluca (the Glowworm); Elephant Hawk Moth.

These and the numerous other species of insects, moths, and butterflies, as well as being vital pollinators, are also part of the extending food-chain. As the aquifer feeds the soil, which grows the vegetation, which fees the insects, so the insects feed the birds - and the bats. This is how nature works. Remove one link and the whole chain fails.

Bats

Not appearing in the “suite of surveys” undertaken by the Applicant in plots 10;12;13;14 (because the “suite” did not come here) are the local bats – in the main they are recorded as Common Pipistrelle. These roost, feed, breed, and hibernate in the coppices, hedgerows, stables, and field shelters of the area. On balmier evenings following warmer days even as early as next month (March 2021 at time of writing) they will emerge to feed on the first hatchings of air-born insects. I will be observing them, as I have for over 13 years, caught in the shafts of moonlight against the naturally dark skies above my own garden. These super-sensitive protected mammals will suffer potentially catastrophic consequences not only from the interference to their food-supply caused by the demolition of environment, but

also from the light, air, noise, and ground pollution resulting from SPR's industrialisation of the AONB.

Birds

Again, as a small exemplifying selection of the many species I have previously listed, in the same hedgerows, coppices, woodlands, fields, stables and field-shelters of plots 10;12;13;14 are memorable species in addition to the rich and diverse population of familiar British Field and Garden Birds. In particular, swallows, nesting through many generations, for as far back as local memory stretches, in the same stables, fieldshelters, eaves, as the bats, and similarly completely reliant on the abundance of insect life supported by the vegetation. These join other summer and winter visitors which rely on the continuity and abundance of the local environment, amongst their number, Lapwing; Redwing; Martins; Nightingale; Swift; Fieldfare; Warblers including Garden and, only last year returning, Cetti's. Plot 13 also, with its pond, provides a respite site for migrating geese.

In the last 5 years, since the land was returned to arable use, particularly rare species have returned to inhabit the skies, hedgerows, coppices, fields, and woodlands of 10;12;13;14. Marsh Harrier; Wood Lark; and a much remarked on rarity, Firecrest.

Reptiles and Amphibians

As with bats and birds, so with the local population of reptiles and amphibians – species dependent on the successful continuing functioning of the natural environment; from soil to tree-top this is one interdependent bio-system. Part of this environment are the frequent, naturally occurring ponds and seasonal water features, a result of the self-same underlying chalk aquifer layer. Increasingly rare and protected species are present. Common Frog; Common Toad; Natterjack Toad (very rare); Grass Snake; Adder; Common and Sand Lizard; Slow-Worm; and, easily viewable during breeding season in the now threatened wildlife pond at Wardens Centre, Newt, including Great Crested. The same pond, and those naturally occurring in plots 10;12;13;14 also host multiple species of Dragonfly and Damselfly, reliant on the viability of the pond-water, and hence aquifer, for both food supply and location of eggs and subsequent larvae. Reptile and Amphibian mitigation measures, which we heard much of back when the Applicant was seeking to acquire Broom Covert for industrialisation, has not been planned – for the simple reason, it seems to me, that, as I have indicated above, the "suite of surveys" referenced by the Applicant did not include Plots 10;12;13;14.

36 *As noted in Section 2, the landfall HDD bores are likely to be located approximately 750m south of the Wardens Trust site*

750m …. 400m … 750m …as previously noted, this seems to be either indecisive or a result of a lack of detailed planning of any kind. Can the Applicant be encouraged to select a location please?

38 *Existing contamination sources can include neighbouring land uses and historical activities within the onshore development area and in its surroundings. From the*

desk-based information and the findings of a site walkover (July 2018, see Appendix 20.4 Geomorphological Baseline of the ES (APP-498)), potential sources of contamination have been identified within the onshore development area and include:

• Agricultural land, which can be associated with some contaminative activities including use/storage of pesticides and herbicides and burial of wastes; and • A number of historical sand and gravel pits (including Thorpe Sand Pit) present in various locations within the onshore development area have been infilled and may contain unknown and potentially contaminated fill material.

This is pure, groundless speculation, without a scrap of actual evidence. The implication, as seen previously in the Applicant's attempt to characterise rural areas as "suburban", is that the area of the landfall and proposed cable-corridor route are already contaminated – the implied conclusion being that it would therefore not matter if they were contaminated further. What and where are the "various locations?" – and if infilled with "unknown" material, what possible knowledge could inform the assumption that the material is "contaminated"?

39 & 40

There are considered to be two key groundwater receptors linked to the landfall:

• Lowestoft Sand and Gravel and any associated private water supplies (including the Ness House well); and • Crag aquifer.

The Chalk aquifer is not considered as a receptor in this assessment due to presence of isolating layer of London Clay and due to depth of the proposed activities

Again, this appears to be a wilful obfuscation of facts. The chalk underlying the London Clay is of no relevance. The crag, till, and mixed chalk elements bearing the aquifer that lies close under the ground level at Ness House and throughout the area of the proposed works is the source of drinking and irrigation waters, and, as has been previously identified by information provided by the Applicant above, is considered to be a "Principal Aquifer"

43 *From the 50m drilled length, up until 110m drilled length, the HDD is expected to be in the Crag Group deposits.*

The statement confirms that the HDD will pass through the strata bearing the aquifer to which we refer as the source of our water supply.

48. *The HDD is likely to be within the Coralline Crag from 110m until 1,300m of the drilling distance. The Crag is expected to provide ideal conditions for HDD.*

Further to the comments recorded above regarding the sudden disclosure that far from protecting or avoiding the previously described as fragile and unstable coralline crag, here we see the massive scope of the planned HDD intrusion. 1190m – almost four fifths of a kilometre to be drilled through. Could the Inspectorate please ensure that EDF is informed of this intrusion into the geological feature which that company has expressed deep concern regarding its stability and integrity.

49. *Previous studies for the area note the presence of vertical joints within the Coralline Crag. Some of the fractures appear to have remained open. These will not pose a problem for bore stability, being vertically oriented, but there might be temporary fluid losses as the drilling bit passes through them. When the bit has passed, the drilling fluid in the fractures will gel to seal the fractures. If persistent losses occur there is a wide range of stop-loss materials that can be added to the drilling fluid to seal the fractures.*

Again, this is based on pure speculation as to the possible size and extent of the vertical joints referenced (and as always, in historical studies carried out by, here, un-named 3rd parties). How wide a gap can the gelling lost fluid (and here we see open admission of planned fluid loss) be expected to bridge? How wide are the fractures? Could escaping fluid gel successfully enough to bridge a gap of a metre? Has this ever been attempted? Are there any examples of this gelling process actually being attempted or successfully completed?

51 & 52

The Applicants propose to implement water quality and levels monitoring at the Ness House well during HDD activities to ensure no that the proposed mitigation is sufficient

Monitoring as described above is already being carried out on a permanent, year-round basis by industry professionals and council authority, as detailed by Dr Gimson in both oral and written representations and submissions. It is highly unlikely that the Applicant, with no experience or knowledge of this field, will be liable to provide a more expert or reliable service in this field. As for the “mitigation” referenced in the above quotation, and also in:

Table 5.2 hydrological Risk Assessment

Provision of a temporary portable water supply tied into the well at Ness House during HDD activities at the landfall

As both Dr Gimson and I have repeatedly pointed out, no specific form of mitigation for any adverse effect to our water supply has yet been evinced. Indeed, we have both predicted, correctly, that the Applicant would use terms of such generality as to be no more than an evasion of the question. “Tied into the well”? – What will be tied into the well? Pipeline from mains water supply? Has the Applicant approached Anglian Water about this? Bottled water? A water bowser? – both already declined as a viable or acceptable alternative by Dr Gimson. The only meaningful inference to be drawn from “mitigation” plans thus far put forward by the Applicant is that it seems clear that contamination of our water supply is openly expected.