Cottam Solar Project

Written Summary of the Applicant's Oral Submissions & Responses at Issue Specific Hearing 3 and Responses to Action Points

Prepared by: Pinsent Masons LLP

December 2023

PINS Reference: EN010133

Document Reference: EX3/C8.1.22

The Infrastructure Planning (Examination Procedure) Rules 2010: 8(1)(c)

Cottam
SOLAR PROJECT

Issue Sheet

Report Prepared for: Cottam Solar Project Ltd.
Examination Deadline 3

Written Summary of the Applicant's Oral Submissions & Responses at Issue Specific Hearing 3 and Responses to Action Points

Prepared by:

Pinsent Masons LLP

#	ExA Question / Item for discussion	Applicant's response
Agenda Item 1 - Welcome, opening remarks and introductions		
1	The Examining Authority (ExA) welcomed participants and read introductions and the public livestream and recording was started.	The following parties introduced themselves: <u>The Applicant</u> • Gareth Phillips, Partner at Pinsent Masons LLP (solicitors for the Applicant) • Claire Brodrick, Legal Director at Pinsent Masons LLP • Eve Browning, Senior Project Development Manager at Island Green Power • Beccy Rejzek, Associate Director at Lanpro (EIA and Planning consultants for the Applicant) • Paul Gregory, Battery safety and testing consultant at BST&T Consultancy Services (consultants for the Applicant) • Harry Fox, Clarkson and Woods, ecologist for the Applicant <u>Lincolnshire County Council</u> • Stephanie Hall, Counsel, Kings Chambers • Neil McBride, Head of Planning Martha Rees, Senior Solicitor • Mr Daniel Moss, Lincolnshire Fire and Rescue Services <u>West Lindsey District Council</u> • Shemuel Sheikh, Counsel, Kings Chambers • Russell Clarkson, Development Manager • Alex Blake, Associate Director, Atkins <u>Nottinghamshire County Council</u> • Stephen Pointer, Planning Policy Manager <u>7,000 Acres</u> • Liz Garbutt • Jeff Summers

#	ExA Question / Item for discussion	Applicant's response
		• Peter O'Grady • Mark Prior <u>Local residents</u> • Simon Skelton <u>LNT Group (owners of Blyton Park Driving Centre)</u> • Alastair Wood, Planning and Development Manager of LNT Group • Alan Mugglestone, Manager of Blyton Park Driving Centre
Agenda Item 2 - The purpose of the hearing and how it will be conducted		
2	The ExA introduced the hearing, including that: • the purpose of the hearing is for the ExA to examine the environmental effects of the proposed development and related matters, and invite certain parties to make oral representations about them; • the hearing is subject to the powers of control of the ExA, as set out in the Planning Act 2008 and supporting legislation; • the ExA will invite parties to speak and will ask questions at relevant points on the agenda and when it otherwise considers necessary; and • all comments, questions and answers are to be directed to the ExA and not directly to any other party.	
Agenda Item 3 – Main Discussion Points		
3A	<u>Socio-Economics</u> • Local employment benefits, in particular in areas of deprivation and the role/deliverability of the	In response to the ExA's question relating to section 6.2 of the Outline Skills, Supply Chain and Employment Plan [APP-349] (the 'Plan') requesting the Applicant explain the difference between the Outline Plan and the "Organisational Framework" described in that section, Mr Phillips noted that in reality there may be little difference in the documents. He described the background to the Plan, noting it was derived from an earlier version produced for the Cleve Hill Solar Park Order 2020. In response to the ExA's question, Mr Phillips noted that for Cleve Hill the Operational Framework is included in the detailed plan but it can be separate.

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	Outline Skills, Supply Chain and Employment Plan [APP-349]; • Effect on the delivery of the Cottam Power Station Regeneration Area; and • Assessment/ effect on the well-being of local residents, in particular during the operational phase.	In response to further questions relating to differences between the Organisational Framework (OF) and the Plan, Mr Phillips responded that the OF is more related to the works programme. He noted that the final version of the plan will still cover matters such as local recruitment, even if this is not covered in the OF. The ExA noted some of the conditional language used in the plan, such as use of "could" rather than "will", and asked why the Applicant could not be more definitive. Mr Phillips responded that the document is iterative and will be developed through consultation with the local authorities. There may end up being controls that are not considered necessary that are in the document at present; this document is intended to sign post what could be achieved. It is difficult to predict what organisations will be available at the point of construction. He noted the Cleve Hill example has ended up being light touch, but that he was happy to work with the local authorities to "firm up" some of the commitments if required. He also confirmed that the final version of the Plan submitted for approval would not use the same conditional language. In response to the ExA's comment regarding how the Plan would address local deprivation, Mr Phillips responded that the Plan was intended to provide benefits to encourage local people into skilled employment that could be facilitated by this Scheme. In response to comments raised by Mr O'Grady relating to high levels of deprivation in Gainsborough, Mr Phillips noted that it was the Applicant's position that this evidence has been captured and taken account of in the Environmental Statement. The purpose of the Plan is to address that deprivation, and there is no local "cap" on employment opportunities in the Plan; it is there to serve all, and that detail can be worked up in consultation with local residents and the local authorities. In response to the ExA's question relating to the utilisation of monitoring the achieve the aims of the Plan (see section 7 of [APP-349]), Mr Phillips responded that, at a high level, the purpose of this monitoring is so that the local authorities can request information from the Applicant about employment opportunities and provides a mechanism for the local authorities to measure the compliance of the Applicant with the Plan. He noted that it is common to large scale development for evidence to be submitted of how jobs have been marketed and advertised, how people have been brought forward for interviews, who has been taken through to second stage interviews and then offered employment. The ExA highlighted paragraph 7.1.2, and asked the Applicant to confirm how the Plan would be implemented and monitored on an ongoing basis, suggesting an annual report. Mr Phillips responded that this could be considered, noting again that the Plan is a "live", iterative document and can be amended before the detailed plan is submitted for approval and during construction. In response to comments made on behalf of LCC and WLDC regarding the use of more imperative language and the inclusion of opportunities to work collaboratively with other developers, Mr Phillips responded that both were good suggestions, and asked both Councils to mark up word copies of the documents with their suggestions. He noted there is strong collaboration between the applicants for the solar projects and agreed there was potential for cumulative benefits. He further added that the same template had been used for all of the Plans across the different Lincolnshire solar projects, and noted that the document needs to be developed in collaboration with local authorities, so welcomed any input. He noted that any ideas raised on this Scheme could be shared with the developer for Gate Burton and others. In response to the ExA's question relating to ethical sourcing of solar panels (see paragraph 7.3 of the Plan [APP-349]), Mr Phillips set out the background to the industry body Solar Energy UK. This body encourages its members to sign up to a commitment to ensure that any supply chain agreements contain robust covenants to ensure no forced labour is involved in the production of materials. He accepted that this is a concern that has been raised by numerous interested parties, and noted that the safeguarding

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		commitments in the Plan are secured through a requirement in the DCO. The local authorities are responsible for requesting further evidence from developers to request how they have adhered to the Plan, which should not be too onerous given the increasing commitments to comply with Environmental, Social, and Governance (ESG) principles. He further noted that the issue of forced labour in supply chains, particularly relating to China, is an issue across many different supply chains, not just solar. In response to a further question from the ExA requesting a commitment for the LPAs to be able to request additional information on supply chains, Mr Phillips confirmed it would be fine to add this to the Plan. *Post hearing note: The Applicant will provide an update to the OSSCEP at Deadline 4.* In response to the ExA's question requesting a progress update on the delivery of the Cottam Power Station Regeneration Area, Mr Pointer on behalf of NCC provided an update relating to the long term aspiration in Draft Bassetlaw Local Plan relating to redevelopment of Cottam Power Station and the other power stations along the Trent. He noted that the cable for the Scheme routing into the Cottam Power Station is unlikely to adversely affect the potential for development, noting the substation is likely to be required in the future for energy infrastructure. Ms Brodrick added that, as has been mentioned, only the cable route corridor is relevant to the redevelopment plans at Cottam Power Station. She noted that the Applicant has been working with EDF, Uniper, and the other solar developers using the shared cable route near to the Power Station, to minimise effects on Cottam Power Station. She noted the Change Request Notification [REP2-109] that has been submitted, noting that EDF were in favour of the proposed changes at Torksey Ferry Road which would be contained in the change application. She noted that the plans include flexibility for each project to be routed into any of the bays in the substation at the grid connection point, as this will be decided by National Grid at a later point. The cable routing has been discussed and is in the process of being agreed with EDF, property agreement discussions and protective provision negotiation is ongoing. The ExA noted the potential for protective provisions to be held back where discussions on confidential property agreements are ongoing, and asked that protective provisions be submitted into the Examination as soon as possible. Ms Brodrick responded that, in this case, some are being negotiated on Gate Burton first and then once finalised will also be agreed for this Scheme. She also noted that, because protective provisions for the benefit of statutory undertakers often include restrictions on the use of CA powers, such restrictions can only be agreed once property agreements have been agreed. *Post hearing note: Please see the C8.1.13B Schedule of Progress regarding Protective Provisions and Statutory Undertakers Revision B submitted at Deadline 3.* In relation to wellbeing, the ExA referred to the response to the ExA's question 1.12.21 in the Applicant's Responses to ExA's First Written Questions [REP2-034] and asked why the listed determinants had been chosen. Ms Brodrick responded that the matter would be confirmed in writing, but that it was the Applicant's view that there is no guidance on how these determinants are chosen, and so professional judgement has been applied. *Post hearing note: Please see the Applicant's response to Action 1 below.* In response to comments made by 7,000 Acres relating to the wellbeing impacts of resulting from the landscape and visual impact of the Scheme, perceived loss of countryside, and disruption to PRoWs, Ms Brodrick noted that a thorough assessment has been undertaken of landscape and visual matters both in terms of residential receptors and impacts on users of public rights of way (ES

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		Chapter 8 Landscape and Visual Impact [REP2-008] and ES Chapter 18 Socio Economics Tourism and Recreation [APP-053]). She noted that the Applicant has produced a PRoW management plan ([REP2-018]) to manage and control the impacts to ProWs during the lifetime of the Scheme. She noted that there are only a few ProWs within the Order Limits which will remain open during operation, and that the Applicant disagreed that there would be a reduction in access as a result of the Scheme. She added that the Applicant has had regard to the use and desirability of PRoWs, which takes into account public perception of the enjoyment of the use of local ProWs. She also noted that the ES has been undertaken in accordance with the Scoping Opinion [APP-064]. In response to comments made by Mr O'Grady relating to (a) a Health Impact Assessment and (b) the loss of agricultural jobs and tourism resulting a net negative effect on local employment, regardless of the implementation of the Plan, and that the methodology used for the socioeconomic assessment (Chapter 18 of the ES [APP-053]) was not sound, Ms Brodrick noted: (a) It was agreed at the scoping stage there would not be a dedicated separate chapter for health impacts, as this would result in duplication given that other topics (air quality, LVIA etc.) consider the impacts on health and wellbeing. Health impacts have been considered throughout the EIA. The Planning Inspectorate confirmed they were in agreement with this approach in its Scoping Opinion [APP-064]. Chapter 21 Other Environmental Matters [APP-056] set out the conclusions of the assessment undertaken in other chapters on health impacts. (b) It was the Applicant's understanding that the local authorities have not identified any issues with the methodology for the assessment in Chapter 18 [APP-053], and so the Applicant respectfully disagreed with Mr O'Grady's comments about the adequacy of the methodology used. Ms Rejzek responded to the comments made by WLDC relating to loss of agricultural employment. She noted the conclusion of there being no more than a low level impact on agricultural supply chains, even when considered cumulatively with other NSIPs in the area. As a result, these effects have not been taken forward for further assessment. Ms Brodrick noted that the Applicant would provide the references for the tables set out in Chapter 18 [APP-053] which set out how these matters have been considered. *Post hearing note: Please see Table 18.23: Summary of Preliminary Magnitude and Significance of Effects and Table 18.29: Cumulative Residual Environmental Effects Subject to Mitigation Measures and Cumulative Effects of Chapter 18 [APP-053].* In respect of any impacts of the Scheme on Blyton Park Driving Centre, Ms Brodrick explained that matters relating to noise could be dealt with now, as the Applicant's noise consultants were on hand to answer questions. She further noted that impacts on the Blyton Park Driving Centre relating to the emergency run off area were not assessed in the Environmental Statement, because the Applicant had not been made aware of the use of the land for this purpose and no formal property rights had been identified over the land included in the Scheme. The Applicant was first made aware of potential impacts during the Examination. No representations were made during the pre-application process. In response to the ExA asking what steps were being taken now to engage with the Driving Centre, Ms Brodrick noted that a meeting had taken place with Blyton Park Driving Centre, and that mitigation options were being considered including changes to the design of the Scheme or to introduce barriers. She further noted that diligent inquiries were ongoing to ascertain the nature of the land rights and usage over the emergency run off area.
3B	Other Points of Clarification	*Battery Energy Storage System (BESS)*

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	• Battery Storage: thermal runaway and associated water supply; and the role of Lincolnshire Fire and Rescue Services and funding; • Waste: baseline assessment beyond 2038; the predicted significant effect on landfill waste handling in Nottinghamshire; and recycling of solar array infrastructure; and • Biodiversity: impacts from Electro-Magnetic Fields on features of the Humber Estuary Special Area of Conservation during operation, and impacts on Ramsar feature. Note: IPs will be given an opportunity to comment on the above.	Mr Gregory stated that he had peer reviewed the Outline Battery Storage System Management Plan (OBSSMP) [REP2-030] submitted at Deadline 2, and described the 4 fundamental elements of BESS safety management, noting that the OBSSMP covers each element in detail. He described the impact of a venting thermal runaway, and noted that it is important to include a deflagration system and explosion prevision system within the BESS to mitigate against this. He noted that the Applicant has committed to the BESS design incorporating this form of protection. He described the fire and explosion testing that the BESS would be subject to, in compliance with NFPA guidance and described the detailed process in place to ensure BESS safety, including the electronic control and detection system. He noted that the Applicant is committing to monitoring and detection systems to identify potential fire events in accordance with NFPA 855 (2023) and NFPA 69 guidelines. The final design will be validated by an independent engineering prior to construction, and approved by Lincolnshire Fire and Rescue Service (LFRS). Mr Gregory noted that water is considered to be the best form of fire suppression, and would be included in each BESS container to put out a fire without the intervention of LFRS. He noted that an independent expert would be appointed to validate the quality of the fire suppression system. He added that the design of the Scheme incorporates space for water containers, at least 10m from the closest BESS container, noting the safety distances for any firefighters being called to an incident (30m, based on explosion risk data). In respect of water supply, he referenced the NFCC guidance which states provisional firefighting supplies "*should be capable of delivering no less than 1,900 litres per minute for at least 2 hours*." LFRS will be able to view the selected BESS system fire test data and an independent Fire Protection Engineer will validate the final water supply requirements. LFRS will be able to view the selected BESS system fire test data and an independent Fire Protection Engineer will validate the final water supply requirements. A BESS design which may require direct LFRS firefighting engagement tactics will not be selected for this facility. Site and BESS design principles and Emergency Response Plan (ERP) content will ensure that LFRS are expected to employ a defensive strategy i.e., only boundary cooling should be employed for cooling of adjacent BESS or associated supporting equipment. This strategy will be finalised with LFRS and be clearly communicated in the ERP. In response to the ExA requesting a calculation of water storage capacity required, Mr Gregory responded that this is dependent on the final size of the enclosures. Ms Brodrick confirmed that the parameter used for the purposes of the EIA was agreed with LRFS as a minimum of 228,000 litres. Paragraph 4.5.33 of the ES Chapter 4 Scheme Description [REP-012] sets this out. This has been included in the Scheme design, but at the point of discharge of the OBSSMP, the Applicant would need to evidence that the amount of storage put forward was suitable and compliant with application guidelines. She noted the Applicant's commitment to pay a financial sum to LFRS so that the final water storage proposals can be validated by an independent expert. The Applicant notes that Mr Moss on behalf of LFRS provided LCC's views on the Applicant's proposals, noting that the standards are in constant evolution given the speed of technological and best practice change and that the basis of LFRS's consideration of the Applicant's proposals is the NFPA guidance. He noted that the water supply levels noted by the Applicant are minimum standards that relate to boundary cooling and preventing propagation. Mr Moss confirmed that LFRS had no points of concern at present as the standards in NFPA were being adhered to by the Applicant. In response to the ExA's question relating to funding of LFRS, Ms Brodrick provided an update that this matter had been covered in detail in the Gate Burton Examination. At Deadline 3, agreed protective provisions with LFRS setting out an obligation to facilitate a site familiarisation exercise will be included in the draft DCO. They also include provision for yearly site visits, the costs being covered by the Applicant. The first payment will be larger and cover the familiarisation process, with yearly payments being lower. Ms Brodrick

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		confirmed that including direct payment to LCC in its role as the local fire and rescue service in protective provisions had been deemed as preferable to a section 106 agreement, due to the legal limitations of the latter. *Post hearing note: Please see Part 16 of Schedule 16 of C3.1 Draft Development Consent Order at Deadline 3 [EX3/C3.1_E].*In response to comments raised by Mr Prior about Work No.2 in the draft DCO and the amount of water required to manage a BESS fire, Mr Gregory noted that the revised BESS Fire Impact Assessment [REP2-071] contained the data and real world testing for cabinet systems that Mr Prior had referred to. He noted that the water supplies assumed on site are based on the assumption the fire will not propagate due to the design of the BESS components, adding that the area is rapidly evolving, with lessons being learned every time there is an incident. He noted that where there have previously been incidents, these have been exacerbated by the local FRS not understanding fully the technology of the BESS. In respect of the comment made by Mr Prior relating to spacing, Mr Gregory responded that the spacing is in compliance with the latest guidance at the time it was drafted, but that it would be revised based on the detailed design of the Scheme. The ExA noted that questions relating to waste would be included in the ExA's second written questions. *Biodiversity: impacts from Electro-Magnetic Fields* In respect of the ExA's question on the effect of electromagnetic fields (EMF) on migratory salmon, Mr Fox noted that the potential effects of electromagnetic fields were scoped out of the Environmental Impact Assessment (see section 3.13 the Scoping Opinion [APP-064]). Furthermore, such impacts on ecological features were not identified during the scoping exercise carried out with PINS and consultation (pre-application and statutory) with bodies such as Natural England and the Lincolnshire Wildlife Trust. He noted that the Applicant had acknowledged the recommendation for a Risk Assessment of EMF impacts on fish in the Trent from the Environment Agency, and Ms Brodrick noted that the Applicant was considering their response. She further noted that the cable route is to be located a minimum of 5m below the bottom of the riverbed, as agreed with the Canal and River Trust, and is not clear whether the Environment Agency had taken this into account when it made its submission on this point. She added that the initial view was that the likelihood of significant impacts from EMF on features of the Humber Estuary Special Area of Conservation during operation is low, and impacts on the Ramsar feature would be minimal, but that this would be confirmed in writing. Mr Fox addressed the point relating to the omission of the Ramsar Site from the Information to Support a Habitats Regulations Assessment (HRA) [APP-357] and confirmed that the HRA would be updated for Deadline 3. He noted he considered it unlikely that any significant effects would be identified, given the spatial overlap between the Humber Estuary SAC and the Ramsar Site. Ms Brodrick confirmed that based on the information that the Applicant currently has, it's unlikely that further assessment work is required and the conclusions will remain the same. If, following discussion with the Environment Agency, the Applicant is given further information, that would need to be addressed. The Applicant is not anticipating any further changes to that document. *Post hearing note: Please see the Applicant's Response to Actions 2 and 3 below.*

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Agenda Item 4 – Updates on Statements of Common Ground		
4	The ExA requested an updated on the progress of Statements of Common Ground between the Applicant and Interested Parties	Ms Brodrick confirmed there were no updates since Deadline 2, but confirmed that discussions were ongoing and that she hoped that progress could be reported on at Deadline 3. *Post hearing update: Please see the Statement of Commonality C8.1.9 B Revision B submitted at Deadline 3 [EX3/C8.1.9_B].*
Agenda Item 5 – Other matters		
5		N/A
Agenda Item 6 – Close		
6		In closing submissions, following comments made by Mr O'Grady relating to the conduct of the Examination and the need for large scale solar, Ms Brodrick responded that the NPS EN-1 (November 2023) currently laid before Parliament provides the most up to date policy support for large scale ground mounted solar as infrastructure of "critical national priority". She noted that NPS EN-1 would be considered to be "important and relevant" in the Secretary of State's decision making on the application for the Scheme. The ExA noted in response that there would be questions relating to the newly published NPSs in the second written questions.

List of actions for the Applicant following Issue Specific Hearing 3 (5 December 2023)

#	ACTION	APPLICANT'S RESPONSE
1	Applicant to explain how the list of wellbeing determinants set out in the response to ExQ 1.12.21 has been determined.	Industry guidance on the assessment of health and wellbeing in EIA is provided through a limited number of sources. The key document used during the pre-application process for the assessment of health effects in the Environmental Statement (ES) was IEMA's "Health in Environmental Impact Assessment: A Primer for a Proportionate Approach" (2017). In this document, determinants of health and wellbeing are given as categories. As such, there is a reliance on professional judgement to determine which individual assessed receptors, and likely effects from developments, are most appropriate to be considered in an EIA , depending on the nature of the project being assessed and the baseline environmental conditions. Further guidance from IEMA ("Effective Scoping of Human Health in Environmental Impact Assessment" and "Determining Significance For Human Health In Environmental Impact Assessment") was published in November 2022. The newly-published guidance documents provided a non-exhaustive list of wider determinants of health which was used to ensure that the human health assessment within the ES was consistent with updated guidance ahead of the DCO application in January 2023. Question 1.12.21 of the Examiner's First Questions pertains to determinants relating to socio-demographics and wellbeing (rather than direct impacts on health, which are assessed throughout the ES) and, as such, the Applicant's response has largely focussed on the impacts assessed in C6.2.18 ES Chapter 18: Socio-Economics and Tourism and Recreation [APP-053]. The determinants set out in the response have been chosen to illustrate that the assessment covers a broad range of health and wellbeing determinants regarding people, lifestyle, economy, and activities (as categorised in IEMA's "Health in Environmental Impact Assessment: A Primer for a Proportionate Approach" (2017)), including those that are more subjective or qualitative. The Applicant has also taken care to assess health and wellbeing impacts that the Scheme is likely to have a plausible causal impact on, in keeping with guidance on ensuring a proportional approach has been undertaken.
2	Applicant to confirm in writing its position of EMF impacts on Humber Estuary Special Area of Conservation and RAMSAR features during operation and whether there is a need for EMF surveys.	The Applicant has undertaken an EMF Risk Assessment which is appended to this document (see Appendix 1).
3	Applicant to update the Information to Support a Habitats Regulations Assessment (HRA) [APP-357] at Deadline 3 to include the RAMSAR Site.	A revised version of C7.20 Information to Support a Habitats Regulations Assessment [EX3/C7.20_A] is being submitted at Deadline 3.

Appendix 1 – Risk Assessment of EMF Impacts on Fish

Cottam Solar Project

Risk Assessment of EMF Impacts on Fish

Prepared by: Clarkson and Woods Ltd.
December 2023

PINS Ref: EN010133
Document reference: Appendix to EX3/C8.1.22

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RISK ASSESSMENT OF EMF IMPACTS ON FISH

COTTAM SOLAR PROJECT

carried out by

CLARKSON & WOODS
ECOLOGICAL CONSULTANTS

commissioned by

COTTAM SOLAR PROJECT LTD.

DECEMBER 2023

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Project title:	Cottam Solar Project		
Document title:	Risk Assessment of EMF Impacts on Fish	Project number:	7479
Client:	Cottam Solar Project Ltd.	Author:	Harry Fox
Version 1:	Final Draft	Issued on:	19/12/2023
Quality Assurance	Checked by:	Approved by:	
	Harry Fox	Tom Clarkson	

1 INTRODUCTION

1.1.1 Clarkson and Woods Ltd. was commissioned by Cottam Solar Project Ltd to provide a Risk Assessment of the potential impacts of electromagnetic fields (EMF) on fish in relation to the crossing of the River Trent by the power export cable within the Shared Cable Corridor.

1.1.2 This issue was raised within the Examining Authority's First Written Questions (ExQ1, [PD-011]), specifically Q1.13.32, which states:

"Why has the ES not considered the potential effects of electromagnetic fields on biodiversity interests, including the lamprey and therefore the potential for effects on the Humber Estuary Special Area of Conservation in this regard? …Your attention is directed towards the Environment Agency's WR [REP-093] in this regard."

1.1.3 This subject was first raised by the Environment Agency in their Deadline 1 Written Representation [REP-093], specifically within Section 3.0, which states:

"…an additional point has been raised with the applicant on the potential impact from the presence of electromagnetic fields (EMF) on ecology where the grid connection corridor proposes to go underneath the River Trent.

The Environmental Statement (ES) does not have any specific reference to EMF and suggests that "Operational phase effects on fish are anticipated to also be neutral." (ES, Chapter 9: Ecology and Biodiversity, EN010133/APP/C6.2.9, page 100).

Given that the potential impact of EMF on ecology is an emerging issue and not assessed within the ES we would suggest a risk assessment is carried out, centred on the grid connection corridor to fully understand the risks during the operation of the proposed development.

As the potential impacts from EMF are dependent on the intensity of the emission, current type, cable characteristics, power transmitted and other surrounding environmental factors a risk assessment would evaluate whether the EMF associated with the proposed development is likely to have any impacts on fish.

Atlantic salmon Salmo salar (hereafter salmon), Sea Trout, European Eel, River Lamprey and Sea Lamprey all use the River Trent to complete migratory journeys. The Humber Special Area of Conservation (SAC) lists River Lamprey and Sea Lamprey, and we know that both species use the River Trent to spawn, laying their eggs in suitable gravels upstream of the proposed cable corridor. Research suggests that the strongest effects from EMF will most likely occur during the embryonic or larval stages of species settling on the bottom of the river (Gill and Desender, 2020). Additionally, the behavioural and physiological responses to EMF in salmon have the potential to impact long-distance migrations due to the increased sources of artificial EMF from renewable energy installations within riverine and marine environments (Gillson et al., 2022). The extent of risks to juvenile Lamprey and migratory salmon from EMFs should be explored in a risk assessment to determine whether the risk from the project, or cumulative risk if the project is to share the cable crossing with other projects, is significant enough that it needs to be mitigated."

1.1.4 This document is a Risk Assessment to determine the potential for adverse effects on Atlantic salmon, sea trout, European eel, river lamprey and sea lamprey through EMF which may arise from the introduction of a 400kV, 1100A (maximum) AC power cable under the river bed near Trent Port. The Risk Assessment also takes into account potential cumulative impacts from the introduction of similar cables at the same crossing point for the West Burton, Gate Burton and Tillbridge NSIP solar schemes.

1.1.5 This document should be read in conjunction with other representations to the Scheme concerning EMF and ecology including:

- Statement of Common Ground with the UK Health Security Agency (UKHSA) [REP-067].
- The Applicant's Responses to Relevant Representations, issue reference ECO-16 [REP-049].
- The Applicant's Response to ExA First Written Questions, response to question 1.13.32 [REP2-034].

2 RISK ASSESSMENT

2.1 Background

2.1.1 The potential effects of electromagnetic fields were scoped out of the Scheme's Environmental Impact Assessment (see section 3.13 of C6.3.2.2 ES Appendix 2.2 EIA Scoping Opinion [APP-064]). Furthermore, such impacts on ecological features were not identified during the scoping exercise carried out with PINS and consultation (pre-application non-statutory and statutory) with conservation bodies such as Natural England and the Lincolnshire Wildlife Trust.

2.1.2 The Government sets guidelines for exposure to EMFs in the UK on advice from the UK Health Security Agency (UKHSA). However, there are no legal requirements for shielding EMFs from underground cables to protect human health in the UK because these cables are, by industry-standard, compliant with the ICNIRP 1998 exposure limits in the terms of the 1999 EU Recommendation even when measured directly on top of them Furthermore, in the Statement of Common Ground with the UKHSA [REP-067], it is noted that the UKHSA stated in its Section 42 Consultation that:

"UKHSA notes that electromagnetic fields have been scoped out of the Environmental Statement (ES) assessment, on the basis of the DCO application including a technical report that demonstrates that relevant design standards have been met for all cabling. UKHSA advises that the DCO technical assessment should be based on the voluntary codes of practice described on page 12 -13 of the following advice document, which was also referenced in UKHSA's response to the Scoping Consultation."

2.1.3 The Applicant agrees with the EA's comment in paragraph 3.4 of their Written Representation [REP-093] that the potential effects of EMF on ecology are an emerging issue. The Applicant is not aware of any such comparable assessment in relation to onshore renewable energy development. Furthermore, there is an absence of any applicable guidance (for example, from the Chartered Institute of Ecology and Environmental Management, or the Chartered Institution of Water and environmental Management) on conducting such assessments, therefore a precautionary assessment based on limited readily-available research findings on the subject is presented.

2.1.4 Electric and magnetic fields are produced from electrical wiring and cables, with electric fields (E-fields, measured in volts per metre, V/m) being produced by voltage and magnetic fields (B-fields, measured in microTeslas, μT) being produced by current[1]. Unlike overhead cables, cables that are buried underground have their electric fields eliminated by a combination of the cable sheathing and the substrate under which they are buried[2][3]. However, magnetic fields are not attenuated in this way, therefore this document is principally concerned with the potential effects from magnetic fields. However, it should also be noted that comparatively weak electric fields can be induced by the movement of water or organisms through such magnetic fields although this is again proportionate to the distance from the source (cable)[4].

2.2 Assessment of Potential Impacts

2.2.1 Natural electromagnetic fields are utilised by many species, with biologically produced electrical fields being used principally for prey detection and the earth's geomagnetic field for navigation and migration. It is feasible, therefore, that the addition of anthropogenic EMFs in the environment could modify these processes depending on the location, extent and magnitude at which they are introduced.

2.2.2 Most of the research conducted to date on the effect of EMFs on fish is based on subsea cables (laid on the seabed, rather than buried). A 2022 literature review of the subject was carried out by the Scottish Government[5] predominantly in relation to marine renewable energy generation and export. The review found that a range of responses to anthropogenic EMF have been observed in a range of fish (predominantly elasmobranchs) and marine invertebrates both in lab trials and field studies. However, it concludes that there

[1] https://www.emfs.info/ - Accessed December 2023. Website operated by the National Grid's EMF Unit.
[2] National Grid (2015) Undergrounding high voltage electricity transmission lines. The technical issues.
[3] https://www.nationalgrid.com/electricity-transmission/document/141896/download - Accessed December 2023
[4] Taormina, B., Bald, J., Want, A., Thouzeau, G., Lejart, M., Desroy, N. and Carlier, A. (2018). A review of potential impacts of submarine power cables on the marine environment: Knowledge gaps, recommendations and future directions. Renewable and Sustainable Energy Reviews, 96, pp.380-391.
[5] Xoubanova, S. and Lawrence, Z. (2022). Review of fish and fisheries research to inform ScotMER evidence gaps and future strategic research in the UK; Evidence Gap FF.07: Electromagnetic Fields. Marine Scotland Science.

is, to date, very little evidence to suggest significant real-world behavioural changes arising from EMF in relation to the installation of subsea cables, characterising potential impacts as likely to be "weak or moderate". One study highlighted the absence of responses in captive Atlantic salmon to a range of artificial magnetic fields[6], while another field study in Pacific salmon species observed a change in migration behaviour in response to subsea cables, but no impact on overall migration success[7]. However, the literature review notes the difficulty of applying the limited research findings in ecological impact assessment and as such identifies knowledge gaps to direct future research.

2.2.3 Sea and river lamprey are the two species for which the Humber Estuary SAC/Ramsar is designated which occur in the Trent and its tributaries, although the vast majority of the Humber's populations are actually found in the upper Ouse and River Aire. Both species are sensitive to electrical fields for prey detection and are not understood to be receptive to magnetic fields[8]. Due to the attenuation of electrical fields by cable casing and soil it is unlikely, therefore, that they will be able to sense any electrical fields generated by the cables. As lamprey have no magnetosensing capabilities, any magnetic fields which may extend into the water column would also have no effect other than in the induction of smaller electric fields[9].

2.2.4 European eel, sea trout and Atlantic salmon are all believed to make use of natural magnetic fields for navigation[10]. However, it is considered most likely that these species' (or their relatives) magnetic navigational 'map' is set when in their embryonic or juvenile stages[11][12][13].

2.2.5 In the case of sea trout and salmon, spawning and nursery locations are typically found on the shallow, non-tidal tributaries of the Trent in its upper catchment, such as the Rivers Derwent, Soar and Dove, significantly distant from the proposed crossing. The River Trent is tidal up to Cromwell Lock[14], some 5km downstream of Newark, and 17km upstream of the proposed cable corridor crossing points. Typically, these fish would only migrate along the Trent, to/from the Humber and beyond as adult fish or sub-adult 'smolts'.

2.2.6 For juvenile European eels, it is believed that magnetic imprinting is linked to the natural fields experienced when in tidal estuaries as 'glass eels' before entering freshwater as 'elvers'[15]. As glass eels are unlikely to be found in the Trent, it is considered unlikely, therefore, that any possible magnetic field detectable above the proposed cable crossing will have a significant effect on any of these species' migratory movements. This is especially the case when the length of riverbed affected by the cable crossing as a proportion of the wider river is considered.

2.2.7 Nevertheless, it would be prudent to apply a precautionary approach to reducing the exposure to artificial EMF as far as practicable through appropriate burial of the cable.

2.3 Design Mitigation

2.3.1 Section 3.8.264 of the National Policy Statement for Renewable Energy Infrastructure EN-3 (March 2023 version, however, text also appears in paragraph 2.8.236 of NPS EN-3, published November 2023) states that "burial of the cable increases the physical distance between the maximum EMF intensity and sensitive species." No recommended burial depth is provided, although National Grid advice indicates that "cables are typically installed 1m below ground"[16].

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[6] Armstrong, J.D., Hunter, D-C, Fryer, R.J., Rycroft, P. and Orwood, J.E. (2015) Behavioural Responses of Atlantic Salmon to Mains Frequency Magnetic Fields. Scottish Marine and Freshwater Science Vol 6 No 9. Edinburgh: Scottish Government, 17pp.
[7] Wyman, M. T., Peter Klimley, A., Battleson, R. D., Agosta, T. V., Chapman, E. D., Haverkamp, P. J., Kavet, R. (2018). Behavioral responses by migrating juvenile salmonids to a subsea high-voltage DC power cable. Marine Biology, 165(8).
[8] Gill, A. B. and Bartlett, M. (2010) Literature review on the potential effects of electromagnetic fields and subsea noise from marine renewable energy developments on Atlantic salmon, sea trout and European eel. Scottish Natural Heritage Commissioned Report No.401.
[9] Gill, A.B. and Desender, M. (2020) 2020 State of the Science Report, Chapter 5: Risk to Animals from Electromagnetic Fields Emitted by Electric Cables and Marine Renewable Energy Devices.
[10] Gill, A. B., Bartlett, M., & Thomsen, F. (2012). Potential interactions between diadromous fishes of UK conservation importance and the electromagnetic fields and subsea noise from marine renewable energy developments. Journal of fish biology,81(2), 664-695
[11] Nishi, T., & Kawamura, G. (2005). Anguilla japonica is already magnetosensitive at the glass eel phase. Journal of Fish Biology, 67(5), 1213-1224.
[12] Naisbett-Jones, L. C., Putman, N. F., Stephenson, J. F., Ladak, S., & Young, K. A. (2017). A Magnetic Map Leads Juvenile European Eels to the Gulf Stream. Current biology : CB, 27(8), 1236–1240.
[13] Gill, A.B. and Desender, M. (2020) *ibid*.
[14] https://canalrivertrust.org.uk/canals-and-rivers/river-trent - Accessed December 2023
[15] Cresci, A., Durif, C.M., Paris, C.B. et al. (2019). Glass eels (Anguilla anguilla) imprint the magnetic direction of tidal currents from their juvenile estuaries. Commun Biol 2, 366.
[16] National Grid (2015) Undergrounding high voltage electricity transmission lines. The technical issues.

2.3.2 The Table below shows various calculated and observed magnetic field values for power distribution installations as well as reference values for public exposure and natural background fields. The values show that the power distribution scenario within the Scheme will fall below permitted and recommended thresholds, and is comparable to domestic situations.

Example EMF Source/Reference Data taken from multiple sources[17][18][19][20]	**Magnetic field** (microTeslas, μT)
Government Guidelines – maximum permitted (Permitted Public Exposure Limit - ICNIRP 1998 exposure limits in the terms of the 1999 EU Recommendation)	360
ICNIRP "Reference Level" for the public The level above which detailed investigation is required	100
Background Natural Geomagnetic Field	c.50
TV, Washing Machine, Microwave	Up to 50
Vacuum cleaner	
Appliance surface	800
1m distance	2
Typical DNO 132kV underground cable (calculated)	
Normal conditions	4.1
Maximum capacity	54
National Grid 400kV pylons (calculated)	
Normal conditions	5-15
Maximum capacity	83
National Grid 400kV underground cables (calculated)	
Normal conditions	31
Maximum capacity	96
National Grid 400kV 0.9m buried cable (monitoring data)	
At cable	24
5m from centreline	3
10m from centreline	0.9
Gate Burton Energy Park 400kV cable at 800A (calculated)	
At 5m from cable centreline	32

2.3.3 The Cottam Solar Project cable will operate with a maximum amperage of 1100A which is 37.5% greater than that of the Gate Burton Energy Park scheme. Therefore, although proportionately greater, the magnetic

[17] Energy Networks Association (ENA) (2012). Electric and Magnetic Fields: the facts. Energy Networks Association.
[18] Electric and Magnetic Fields. National Grid Hinkley Connection Project. https://www.nationalgrid.com/electricity-transmission/document/141896/download - Accessed December 2023
[19] Underground Power Lines and Health – Parliament Research Briefings - https://researchbriefings.files.parliament.uk/documents/SN06453/SN06453.pdf - Accessed December 2023
[20] https://www.emfs.info/ - Accessed December 2023. Website operated by the National Grid's EMF Unit.

fields emitted by the Cottam Solar Project cable are likely to be comparable to that of the Gate Burton Scheme. Magnetic fields are likely to be less than or comparable to natural background levels at 5m from the cable centreline, and within national compliance thresholds. The Cottam Solar Project 400 kV AC grid connection cable will be buried to a minimum depth of 5m below the lowest point of the riverbed. This depth will significantly reduce the EMF, particularly magnetic (B-field), exposures within the water column or at the river bed since it is far greater than compared with a typical installation, as can be seen above. Consequently this is considered a precautionary approach. This depth specification is included in Table 2.5 of **C7.15_B Concept Design Parameters [EX3/C7.15_B]** which is secured by Requirement 5 in the Draft DCO **[EX3/C3.1_E]**.

2.3.4 Although it is a DC cable and the proposed cable is AC, the value for the Gate Burton Energy Park cable is considered a good proxy for the likely EMF emitted from the proposed cable.

2.3.5 The grid connection cables for West Burton Solar Project and Gate Burton Energy Park will also be buried to a minimum depth of 5m below the riverbed in the same location and therefore the cumulative EMF exposure will also be significantly reduced. Information is not yet available on the burial depth of the Tillbridge cable, but it is considered likely that a similar approach would be adopted.

2.4 Conclusion

2.4.1 Electric fields generated by the proposed cable are not likely to be perceived beyond the armouring of the cable itself, and certainly not beyond the 5m minimum buried depth below the riverbed, therefore potential effects of electric fields on fish are not considered likely.

2.4.2 Magnetic fields likely produced by the cable are highly likely to be within permitted exposure limits and induced electric fields are likely to be minor. The burial depth is five times greater than that typically used for similar installations, which is considered to significantly mitigate EMF risks.

2.4.3 It is considered that the species assessed will not be exposed to any EMF emitted from the proposed cable during their most sensitive lifestages (juvenile/embryonic stages when it is believed that magnetic imprinting is undergone). Any residual exposure would be during adult or sub-adult stages and would be highly localised and transitory given the mobility of these species.

2.4.4 Current scientific research indicates that while EMF impacts on fish have been observed in controlled and real-world situations, significant population-scale impacts on life-cycles and migration have not been recorded.

2.4.5 On the balance of available evidence and mitigation proposed, it is considered that the risks to the assessed species of fish in the River Trent from EMF associated with the proposed cable are acceptable and the probability of significant adverse effects is extremely low.

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