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Cory Decarbonisation Project Case Team
Planning Inspectorate
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(Email only)

MMO Reference: DCO/2023/00007
Planning Inspectorate Reference: EN010128

26 November 2024

Dear Sir or Madam,

Planning Act 2008, Cory Environmental Holdings Limited (CEHL), Proposed Cory Decarbonisation Project Order

Deadline 1 Submission

On 18 April 2024, the Marine Management Organisation (the "MMO") received notice under section 56 of the Planning Act 2008 (the "PA 2008") that the Planning Inspectorate ("PINS") had accepted an application made by Cory Environmental Holdings Limited (the "Applicant") for determination of a development consent order for the construction, maintenance and operation of the proposed Cory Decarbonisation Project (the "DCO Application") (MMO ref: DCO/2023/00007; PINS ref: EN010128).

The Applicant seeks authorisation for the construction, operation, maintenance and decommissioning of a carbon capture facility, including supporting plant and ancillary infrastructure.

This written representation is submitted without prejudice to any future representation the MMO may make about the DCO Application throughout the examination process. This representation is also submitted without prejudice to any decision the MMO may make on any associated application for consent, permission, approval or any other type of authorisation submitted to the MMO either for the works in the marine area or for any other authorisation relevant to the proposed development.

Yours faithfully

[redacted]

Daniel Fantarrow
Marine Licencing Case Officer

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Contents

1. Comments on Relevant Representations from other interested parties

The MMO has reviewed the Relevant Representations of the following interested parties:

- Environment Agency
- Port of London Authority
- Natural England

The MMO offers the following comments in respect of these submissions:

1.1 Environment Agency (EA)

1.1.1. The MMO has reviewed the Environment Agency's Relevant Representation and notes their comments on sediment sampling to understand potential contamination at the depth of the proposed dredge pocket. The MMO would advise the applicant to liaise with us regarding sediment sampling. Please also refer to the points raised in section 3.2 below.

1.1.2. The MMO advises that any sediment sampling and conditions relating to this need to be contained with the DML.

1.2. Port of London Authority (PLA)

1.2.1. The MMO has no comments regarding the points raised and will maintain a watching brief on any discussions, in particular if any mitigation should be secured within the DML.

1.3. Natural England (NE)

1.3.1. The MMO has no comments regarding the points raised and will maintain a watching brief on any discussions, in particular if any mitigation should be secured within the DML.

2. MMO Comments on the updated Development Consent Order (DCO)

The MMO has reviewed the Applicant's updated draft DCO provided under AS-014 and thanks the Applicant for amending parts of the DCO and DML. However, the MMO notes that several major points have not been amended. Therefore, please see further comments from the MMO with regards to the updated DCO below. Please note that this is only an initial review, and the MMO intends to provide further comments regarding the DCO and DML at Deadline 2 on 13 December 2024.

2.1. As raised in our Relevant Representation, the MMO has transitioned away from using the term 'Licence Holder' to the term 'Undertaker'. The MMO has noted that this phraseology has been used here and throughout the document and urges the Applicant to amend the term 'Licence Holder' to 'Undertaker' throughout the DML going forward.

2.2. The MMO considers that following definitions should be included within the DML. We would be happy to discuss wording for these definitions if required.

"Local Planning Authority"
"MCMS"
"Notice to Mariners"
"Percussive Piling"
"Seabed"
"Vessel"
"HU60"
"HU56"

2.3. The address in section 2 (b) is currently incorrect and should be amended to be – Marine Management Organisation, Muriel Matters House, Breeds Place, Hastings, Suffolk, TN34 2EZ
Tel - 0208 026 9180
Email - hastings@marinemanagement.org.uk

2.4. Additionally for section 2, the following should be added -
(3) Unless otherwise advised in writing by the MMO, MCMS must be used for all licence returns or applications to vary this licence. The MCMS address is: https://marinelicensing.marinemanagement.org.uk/mmofox5/fox/live/MMO_LOGIN/.
(4) Unless otherwise stated in writing by the MMO, all notifications required by this licence must be sent by the undertaker to the MMO using MCMS.

2.5. The MMO previously requested in our Relevant Representation that the exact coordinates be provided in Part 1 of the DML. The Applicant has stated in AS-043 that these were in the Works Plans so are not required here. However, the DML is a standalone document and it cannot refer to containing information in different documents or plans. We again request that these be provided in the DML.

2.6. Piling
The mitigation measures included for piling in the outline code of construction practice document and the mitigation set out in the 'Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise' document by Joint Nature Conservation Committee (JNCC) that the Ecological Clerk of Works (ECoW) will be following, must be included in the DML. As mentioned in point 2.5 above, any conditions or mitigation contained in other documents must be copied over to the DML as this is a standalone document that encompasses all the mitigation in one place.

Point 12, the MMO considers this condition is not detailed enough and we request the following conditions are added –

- Between 1 March and 30 June (inclusive), in any given year, no piling of any type must take place in the water.

- No piling of any type is permitted between sunset and sunrise each day. The times of sunset and sunrise should be set in accordance with HM Nautical Almanac Office data.
- Soft Start requirements/vibro piling requirements
  There shall be at least a 20 minutes “soft start” period prior to the commencement of any piling and wherever possible the undertaker will use vibro-piling methodology whilst it is recognised that percussive piling may be required to drive the piles to their ultimately required depth.

2.7. The MMO, in our Relevant Representation, requested several other conditions be included within the DML which have not been. Therefore, we request again that these be included –
"Notice to Mariners" - The MMO would expect to see provisions covering this along these lines: Notice to Mariners 22.— (1) Local mariners, fishermen’s organisations and the UK Hydrographic Office must be notified of any licensed activity or phase of licensed activity through a local Notice to Mariners. (2) A Notice to Mariners must be issued at least 5 days before the commencement of each licensed activity or phase of licensed activity. (3) The MMO and Maritime and Coastguard Agency must be sent a copy of the notification within 24 hours of issue. The Notice to Mariners must include - (a) the start and end dates of the work; (b) a summary of the works to be undertaken; (c) the location of the works area, including coordinated in accordance with WGS84; and (d) any markings of the works area that will be put in place. (4) A copy of the notice must be provided to the MMO via MCMS within 24 hours of issue of a notice under sub-paragraph (1)."

2.8. "Pollution and Spills" - Given the environmental impact and risks here the MMO would expect to see significantly more detail and consider this should be amended to: “9.— (1) Bunding and storage facilities must be installed to contain and prevent the release of fuel, oils and chemicals associated with plant, refuelling and construction equipment containment must be used with a capacity of no less than 110% of the container’s storage capacity. (2) Any oil, fuel or chemical spill within the marine environment must be reported to the MMO Marine Pollution Response Team as soon as reasonably practicable, but in any event within 12 hours of being identified in accordance with the following, unless otherwise advised in writing by the MMO— (a) within business hours on any business days: 0300 200 2024; (b) any other time: 07770 977 825; or (c) at all times if other numbers are unavailable: 0845 051 8486 or dispersants@marinemanagement.org.uk. (3) All wastes must be stored in designated areas that are isolated from surface water drains, open water and contained to prevent any spillage. (4) The undertaker must comply with the existing marine pollution contingency plan in place as detailed in the construction environmental management plan.”

2.9. "Marine Written Scheme of Archaeological Investigation" - The MMO considers that a marine written scheme of archaeological investigation should be included within the DML, and we suggest potential wording for this below:
“Archaeological method statements, together with a written Report on any consultation carried out with Historic England and the relevant planning authority on matters related to their respective functions in their preparation, must be

submitted to and approved by the MMO in writing in accordance with the provisions of the outline marine written scheme of investigation and a subsequent update must be provided to the MMO six weeks before commencement of any licensed activity to which the method statement relates."

2.10. "Marine Noise Registry" - As works include piling, the MMO would expect to see a condition regarding the Marine Noise Registry, for example as below: - Only when impact driven or part-driven pile foundations or detonation of explosives are proposed to be used as part of the foundation installation the undertaker must provide the following information to the Marine Noise Registry (MNR)— a) prior to the commencement of the licensed activities, information on the expected location, start and end dates of impact pile driving/detonation of explosives to satisfy the Marine Noise Registry's Forward Look requirements; and (b) within 12 weeks of completion of impact pile driving/detonation of explosives, information on the exact locations and specific dates of impact pile driving/detonation of explosives to satisfy the Marine Noise Registry's Close Out requirements. (2) The undertaker must notify the MMO of the successful submission of Forward Look requirements.

2.11. "CEMP" - The MMO would expect to see some provisions along these lines: "Construction environmental management plan 8.—(1) No licensed activities may be commenced until a construction environmental management plan for them has been submitted to and approved by the MMO following consultation with the relevant planning authority, the Environment Agency and Natural England on matters related to their function; and the submitted construction environmental management plan must be in accordance with the outline construction environmental management plan, unless otherwise approved by the MMO. (2) Any construction environmental management plan submitted pursuant to sub-paragraph (1) and any construction environmental management plan submitted pursuant to paragraph 6(1) of Schedule 2 (requirements) of the Order may be comprised in the same document or separate documents." And "all licensed activities must be carried out in accordance with the construction environmental management plan for those activities approved pursuant to paragraph [] of this Schedule where applicable, unless otherwise approved by the MMO."

2.12. The MMO reiterates that the DML is a standalone document and any conditions related to the marine environment that are detailed within other documents submitted to the ExA need to be detailed within it.

3. Comments on Applicant's response to MMO Relevant Representation

Following submission of the MMO's Relevant Representation, the Applicant has provided their responses to each point raised, submitted to the ExA under AS-043. The MMO has reviewed this document with regards to the remaining outstanding issues related to the following topics:

- Coastal Processes
- Dredge and Disposal
- Benthic Ecology
- Shellfisheries
- Fisheries and Fish Ecology
- Underwater Noise

The MMO has outlined its position as it relates to these matters below for the ExA's awareness:

3.1. Coastal Processes

3.1.1. The MMO considers that the Applicant has responded to our previous concerns regarding coastal processes. Therefore, the MMO confirms that we have no further comments regarding this topic.

3.2. Dredge and Disposal

3.2.1. The Applicant has alleviated one of the previous concerns raised by the MMO, however most remain outstanding. Please see below the key areas of concern raised.

Dredging

3.2.2. The Applicant has confirmed within the Change Request and Consultation Report Appendices (page 57) *"As set out in Chapter 2: Site and Proposed Scheme Description of the Environmental Statement (ES) Volume 1) (APP-051) at Paragraphs 2.4.61 to 2.4.62, dredging activities will be carried out using a backhoe dredger. WID and TSHD dredging will not be undertaken as part of capital or maintenance dredging for the Proposed Scheme".* The MMO, in consultation with the Centre for Environment, Fisheries and Aquaculture Science (Cefas), therefore considers that the Applicant has addressed the original comments.

3.2.3. The original comment seeking to clarify which Marine Licence the maintenance dredging will be permitted under remains outstanding and the MMO requests further information is provided on this.

Sampling

3.2.4. The MMO notes from the Change Request and Consultation Report that the Applicant made a commitment to complete additional sediment sampling at

depth across the proposed dredging profile, as per SAM/2024/00042. We further note that a disposal site will be selected upon review of the sample results. The MMO therefore considers the provision of the results is likely to address some of the previous concerns raised in our Relevant Representation, pending completion of the sample plan consultation.

Validity of Environmental Statement Conclusions

3.2.5. The Applicant has still not provided evidence as to why they categorise the magnitude of impact as 'medium' for most receptors, 'low' for marine plants and macroalgae, and 'negligible' for plankton and marine mammals. The evidence to assess these conclusions is likely to be the sample results, so the MMO considers that this can be revisited once the samples results are provided.

3.2.6. Evidence should be provided to support the Applicant's conclusions regarding magnitude of impact. Until then, the original comment remains outstanding. The evidence for this will likely be the sample results so the MMO requests that the Applicant review and update the Environmental Statement as appropriate alongside the sample results when available.

3.2.7. In addition, it does not appear that the Applicant has sufficiently assessed the impacts of changes in water quality and the release of contaminants resulting from the proposed maintenance dredging. The Applicant should assess impacts from maintenance dredging separately and provide this assessment for review.

3.2.8. The MMO notes from the Change Request and Consultation Report Appendices (page 59) the Applicant has *"described, with evidence, that the Change is not likely to result in changes to the conclusions within the Environmental Statement. This is presented at Table 4-1 of the main report".* However, it is not clear which document the 'main report' is referring to, thus, the MMO is unable to confirm at this time that the Change has been assessed in an appropriate and proportionate manner. The MMO, in consultation with Cefas, would be happy to review the evidence if the Applicant could provide the report for review. Until then, this conclusion of the Environmental Statement remains outstanding.

Summary

3.2.9. The MMO thanks the Applicant for confirming the dredge method. It is likely that many of the concerns will be alleviated upon the provision of the sample results, on the condition that the sample plan has been adhered to and the results are provided on the correct template. The MMO suggests that the Applicant reviews their Environmental Statement alongside their sample results. However, more information and evidence are required to consider the remaining outstanding comments resolved.

3.2.10. An appropriate disposal site needs to be selected once the sample results are available, Environmental Statement conclusions should be reviewed (which will be largely informed by the sample results), and the impacts of changes in water quality and the release of contaminants resulting from the proposed activity should be assessed.

3.3. Benthic Ecology

3.3.1. The MMO's previous concern regarding the level of identification achieved has been addressed (i.e., damaged specimens could not be identified to species level) and we welcome the Applicant's commitment to share results of benthic sampling survey(s) more widely. The MMO therefore confirms that we have no further concerns or comments regarding impacts to benthic ecology from this proposal.

3.4. Shellfisheries

3.4.1. The MMO, in consultation with Cefas, confirms that we have no further concerns regarding shellfisheries impacts in relation to this application.

3.5. Fisheries and Fish Ecology

3.5.1. The Applicant has not addressed all the previous comments and concerns raised by the MMO. The outstanding concerns mainly relate to the appropriateness of the suggested mitigation measures along with the Applicant's justification for these. It should be noted however, that some appropriate changes to the mitigation measures have now been made, including the commitment to a nighttime restriction on piling works to reduce the impacts to species such as European eel (*Anguilla anguilla*) which undertake nocturnal migrations.

3.5.2. The Applicant has still not presented the sensitive migratory periods for diadromous Thames fish, apart from eel. It was previously requested, that the upstream/downstream migrations of the relevant sensitive species must be clearly presented (e.g. in a table). The Applicant has justified the lack of inclusion of such information by stating that the *"suggested mitigation period (April to September) is based upon the migration of European smelt"* (*Osmerus eperlanus*). Also stating that *"this period also overlaps with the main European eel migration period (March to October) therefore it is deemed sufficient"*. Whilst it is true that this mitigation period suggested by the Applicant overlaps some of the sensitive migratory periods of smelt, along with other species, not presenting the migration period(s) for each species does not allow easy interrogation of the proposed dates. If a table of the migratory periods was clearly presented it would be clear that the suggested mitigation period does not provide appropriate protection for smelt. The MMO considers that this must be provided for review.

3.5.3. The temporal restriction on piling activities suggested by the Applicant between the months of April – September has not been adjusted, so it still doesn't provide adequate protection for migrating smelt. Again, it would have helped the assessment and the justification of the chosen mitigation period if the Applicant had clearly presented the sensitive migratory periods for the key fish receptors. As previously raised by the MMO in our Relevant Representation, the month of March can be considered a key period of smelt migration as they migrate upstream to reach their spawning grounds (sites near Wansworth Bridge and Greenwich). Smelt are expected to migrate upstream past the project site in late February/ early March, which is supported by several studies showing that; smelt spawning occurs in early March in the Thames (Maitland, 2003), smelt spawn over an elongated period of five weeks during March and the beginning of April with a one-to-three-week peak spawning period within that window (ZSL, 2016), and that high

abundances of several-weeks-old smelt were found at Greenwich in 2018 (10km upstream from the proposed development) (ZSL, 2019). Therefore, the MMO, in consultation with Cefas, has a high level of confidence that piling works undertaken below the water line during March will overlap with the upstream migration of adult smelt from February onwards. We do note that the Applicant has now stated that activities occurring in the month of March will focus on, and be limited as much as practicable, to low tide and within a dry environment. Nevertheless, this still allows the potential for piling activities to occur during a key period for smelt migration and fall short of a full restriction. If the Applicant could commit to no piling operations occurring below the water during March, then this would largely eliminate the potential for significant adverse impact to smelt from underwater noise from piling. For this reason, and in line with other developments of a similar nature in this part of the Thames, the MMO requests the following temporal mitigation measure to be included within the DML to reduce the potential impacts on migratory species:

Between 1 March and 30 June (inclusive), in any given year, no piling of any type must take place in the water.
Reason: to protect adult European smelt during their upstream migration to their spawning grounds. Additionally, a restriction until end of June will afford protection to juvenile/larvae migration downstream of the site for both smelt and Atlantic salmon.

3.5.4. The Applicant has now also responded to the concerns raised in the previous consultation, relating to the material changes to the project design envelope. It is stated that these changes will not result in any increases in piling operations, and despite the dredge volume increasing, the duration of the dredging works will remain the same at six months. Based on this clarification by the Applicant, the MMO is content that, with the appropriate mitigation, the changes to the project design will not significantly increase the potential impacts to fish receptors.

3.6. Underwater Noise

3.6.1. The MMO, in consultation with Cefas, considers that the Applicant has largely addressed the initial queries raised and has provided additional clarity where required. Please see the Table 1 and 2 below for the MMO's full responses to the responses provided:

Table 1: The MMO's responses to comments raised regarding Underwater Noise

Ref # Relevant Representation	Applicant Response	MMO Comments
5.2.19 2.6.6 It is not clear how the 4% value for harbour porpoise and 2% in the case of seals, mentioned in the statements above, were calculated, or indeed which injury zone (PTS or TTS) they are referring to. We note that the duration of the piling activity (30 minutes per day) is indeed approximately 4% of the 12 hour "working day" duration, but the swim times for harbour porpoise are 7 minutes (for the PTS zone) and 51 minutes (for the TTS zone), and thus would correspond to different percentages of the 12-hour working day.	The fleeing calculations within paragraphs 7.2.22 and 7.2.23 of Appendix 6-4: Underwater Noise Assessment (APP-084) were included to provide a very conservative contextual consideration of the exposure times in conjunction with the 24hr SEL criteria within Southall et al. 2019. A summary of the calculations for harbour porpoise and seal TTS exposure times have been provided below for clarity, followed by a description of the potential limitations associated with this approach. Harbour Porpoise: To travel 4559m (the predicted cumulative SEL TTS impact range), travelling at 1.5m/s, would take 51 minutes. 51 minutes is 4% of a 24hr period. Seals: To travel 2333m (the predicted cumulative SEL TTS impact range, travelling at 1.5m/s, would take 26 minutes. 26 minutes is 2% of a 24hr period. It is understood that the comparison of fleeing times with impact ranges representative of stationary receptors overestimates exposure time. Furthermore, it is recognised if fleeing behaviour was explicitly included within	The MMO, in consultation with Cefas, thanks the Applicant for the clarification that the calculated values relate to Temporary Threshold Shift (TTS) and that a duration of 24 hours has been assumed. In this regard, this answers the initial query. However, we would reiterate our original comment (see Reference 5.2.20 below) that an animal receptor would accumulate a noise exposure exceeding the injury threshold (PTS or TTS) if it remains inside the respective zone for the duration of activity – which in this case is only 30 minutes. Thus, we can immediately observe that the 51 minutes needed by a harbour porpoise to leave the TTS injury zone (i.e., to swim across 4559 m with 1.5 m/s) exceeds the 30-minute duration of the piling activity, and thus indicates that in this case, fleeing would not reduce the noise exposure accumulated during piling below the TTS threshold. For clarity, the MMO, in consultation with Cefas, noted during the meeting on 19 August 2024 that some aspects of the underwater noise assessment were confusing and required further explanation. Hence our original comment above, that it was not clear how the 4% value for harbour porpoise and 2% in the case of seals, were calculated. As noted in our previous advice (see comment reference 5.2.23 below), we confirmed that, based on our sense-checking of the modelling results, the extent of the injury effect zones for stationary receptors look plausible under the scenario assumptions detailed in Table 7-11 and in Section 7.2 of the noise appendix. The MMO therefore considers that no further action is required as such.

	the NMFS methodology, the impact ranges would reduce. As per a meeting with the Applicant on 19 August 2024, the MMO expressed satisfaction with the assessment, and that the impact ranges using the NMFS methodology were validated by the CEFAs in-house modelling tools.	
5.2.20 2.6.7 Furthermore, there seems to be a misunderstanding as to the meaning of the injury effect zones, which were calculated for stationary animal receptors exposed to impact piling noise. An animal receptor would accumulate a noise exposure exceeding the injury threshold (PTS or TTS) if it remains inside the respective zone for the duration of activity – which in this case is only 30 minutes. Thus, if one desires to construct an argument based on the potential duration an animal spends inside these effect zones (i.e., the "swim times"), then these durations should be compared to the duration of the noise generating activity (so the total piling duration) and not an arbitrary 12-hour interval. Noting these, we can immediately observe that the 51 minutes needed by a harbour porpoise to leave the TTS injury zone (i.e., to swim across 4559 m with 1.5 m/s) exceeds the 30-minute duration of the piling activity, and thus indicates that in this case, fleeing would not reduce the noise exposure accumulated during piling below the TTS threshold.	The assessment is based upon a worst case scenario (i.e. animals will remain stationary and will not flee from noise generating activities) and does not account for the fact that harbour porpoise are rare in this section of the Thames and therefore unlikely to interact with the Proposed Scheme on a regular basis. It should also be noted that the Proposed Scheme is proposing to use an Ecological Clerk of Works (ECoW) as mitigation before the piling works commence to ensure that no marine mammals are within 500m of the works to further mitigate for any impacts, as described in Section 8.7 of Chapter 8: Marine Biodiversity of the Environmental Statement (Volume 1) (APP-057) the Outline CoCP (as updated alongside this report). The MMO's comments are noted. However, this matter was discussed in more detail during the meeting on 19 August 2024, where the MMO expressed satisfaction with the assessment approach (including assumptions made about noise exposure), and that the impact ranges using the NMFS methodology were	As above and for clarity, it was confirmed during the meeting on the 19 August 2024 that based on the MMO's and Cefas' sense-checking of the modelling results, the extent of the injury effect zones for stationary receptors look plausible under the scenario assumptions detailed. The MMO welcomes that the Project is proposing to use an Ecological Clerk of Works (ECoW) as mitigation before the piling works commence to ensure that no marine mammals are within 500m of the works to further mitigate for any impacts. It is our understanding that the ECoW will follow measures developed by JNCC and set out in the 'Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise'. For completeness, the main mitigation measures proposed by the Applicant are: • Marine mammal observations will be carried out during piling works by an ECoW. The ECoW will carry out marine mammal observations 30 minutes prior to any piling being undertaken to ensure that there are no marine mammals (visually sighted) within 500m (the mitigation zone) of the proposed works. • A soft start to piling operations will be used to ensure an incremental increase in pile power over a period of no less than 20 minutes, until a full operational piling period is achieved; should piling cease for a period longer than 10 minutes, the soft-start procedure may need to be repeated in line with the marine mammal

	validated by the CEFAS in-house modelling.	observations. • If marine mammals are detected within the mitigation zone during the search, the soft start must be delayed until they have left the mitigation zone; there must be a minimum of a 20 minute delay from the time of the last detection within the mitigation zone and the commencement of the soft-start to allow for animals unavailable for detection (i.e. not re-surfacing in that time) to have moved outside of the mitigation zone). A full soft start may be undertaken after any delay due to the presence of marine mammals within the mitigation zone. • In situations where seals are congregating around a fixed platform within a survey area, it is best practice for the soft start to commence at a location at least 500m from the platform, where possible; and • If breaks of longer than 10 minutes are required, a full pre-search and soft start should be carried out before the construction works re-commence. The MMO considers that the above mitigation must be included within the DML.
5.2.21 2.6.8 On a more fundamental level, we need to point out that the logic of comparing the extent of the stationary injury effect zone with the swim times / distances of fleeing animals cannot be used to categorically disprove the risk of injury for fleeing animals. An animal does not have to spend the entire duration of the noise generating activity time inside the zone to be exposed to injury levels, except if it sits in the places where the cumulative exposure is exactly equal to the injury threshold value (e.g., at the edge of the zone); anywhere else (where the cumulative exposure over the	As above	Please see above comments regarding this point.

activity duration exceeds the threshold, like nearer to the source location) it will clearly reach the threshold before the end of activity.		
5.2.22 2.6.9 As pointed out above, the essential meaning of an injury effect zone, calculated for stationary receptors, has to be understood as the zone where an animal will accumulate exposure equal or above the threshold if it remains there for the entire duration of the activity (let us call this situation Scenario A). In the event that an animal flees and thus is present inside the zone for a duration less than the entire duration of the activity (we call this Scenario B), its exposure will logically be lower than in Scenario A. However, there is no guarantee that in the fleeing Scenario B the exposure will drop below the threshold (only that it will be less than in Scenario A). Additionally, the comparison is further complicated by the fact that the activity noise footprint extends outside these stationary injury zones, and a fleeing animal will continue to accumulate noise exposure even after crossing the zone boundary, which might thus still take its exposure above the threshold. These observations serve to emphasize that predicting the existence of the cumulative exposure effect zones and their extent for fleeing receptors requires an explicit inclusion of the fleeing behaviour of the animals into the model and cannot be readily and fully inferred from the	As above	Please see above comments regarding this point.

extent of the corresponding stationary effect zones.		
5.2.23 2.6.10 Based on sense-checking of the modelling results, we can confirm that the extent of the injury effect zones for stationary receptors, as shown in Table 7-12, are plausible under the scenario assumptions detailed in Table 7-11 and in Section 7.2. Furthermore, using Cefas' in-house modelling tools, we would estimate that for fleeing animals, the extent of the injury zones would be reduced, but not eliminated. More specifically, our PTS range estimate for fleeing harbour porpoise is in the order of 100 m (compared to more than 600 m for stationary receptors), while for the TTS range we estimate a reduction of less than 50%, namely to 2.5 - 3 km, compared to more than 4.5 km for the stationary receptors. Thus, fleeing can indeed have an important role in reducing the risk of injury, especially in the case of PTS, where the extent of stationary effect zones is not very large in the first place, although the relative short duration of piling means that this role is reduced for the effects that extend over a larger zone, such as TTS.	This response is noted as are the findings of CEFAS in-house modelling, which were further clarified in the meeting between the Applicant and the MMO on the 19 August 2024. See comments above (5.2.19) for acknowledgement of reduction of impact when considering fleeing animals.	The MMO considers that no further action is required on this point.
5.2.24 2.6.11 It would be helpful if further clarity can be provided regarding the piling scenarios presented in the assessment. For example, for vibro-piling, the assessment considers a total of 15 piles installed per day, with a duration of 20 minutes per pile (see Table 7-9 in the report). However, for the impact piling scenario, the assessment	Vibro-piling: Up-to 15 piles per day to be installed. Each pile has been assumed to take 20 minutes of continuous vibratory piling until refusal based on experience on similar projects. Impact Piling: 1 pile per day would be installed using impact piling. It was assumed that each pile required 900	The MMO notes these comments, and thanks the Applicant for the justification.

is based on the installation of only a single pile per day (as per Table 7-11). Paragraph 7.2.26 confirms that (impact) piling activity will be taking place for 30 minutes per day. 2.6.12 The embedded mitigation is set out in section 8.7 of Chapter 8 Marine Biodiversity. The mitigation proposed for marine mammals appropriately follows the JNCC (2010) guidelines for minimising risk of injury to marine mammals from piling noise, which the MMO supports.	strikes to refusal, based on experience on similar projects. These parameters are considered conservative and representative of a typical worst case scenario. The most detailed information available on the proposed piling scenarios are provided in Section 6 of Appendix 6-4: Underwater Noise Assessment (Volume 3) of the Environmental Statement (Volume 3) (APP-084).	
5.2.25 2.6.13 There is a risk of a temporary acoustic barrier during pile driving operations. Specifically, paragraph 7.1.14 of Appendix 6-4 acknowledges that "TTS effects are anticipated to occur across most of the width of the River Thames during low tide. This therefore potentially creates a partial temporary barrier to fish movements". TTS is different from behaviour (TTS is a temporary hearing impairment). If TTS effects are anticipated across most of the river, then it is reasonable to expect behavioural effects (in terms of disturbance or displacement) which could potentially impact fish movements.	This response is noted. It is worth noting, whilst the assessment came to this conclusion in the modelling, consideration of the proposed piling activity and precautionary mitigation implemented (which can be found in the Outline CoCP (as updated alongside this report)) should be considered in combination with the assessment findings. No impact piling will occur at night, and piling activity will not be continuous (limited to 30 minutes per day for percussive piling), therefore a window for fish movement will be available. In addition, as discussed in the meeting on 19 August 2024, piling and construction activity in March will focus on and be limited as much as feasible to low tide on dry areas (as set out in the outline CoCP), effectively removing any impact to migratory fish such as smelt and eel during March. The main concerns raised by the MMO to in channel works in March, was to potential impacts to smelt migration	The MMO notes this response, please see comments in Section 3.5 regarding migratory fish species.

	through the River to upstream spawning grounds. By restricting instream works at this time, it should reduce potential behavioural impacts. In addition to limited works in March, all construction activities within the River will be suspended between April and September.	

Table 2: The MMO's responses to comments raised regarding the Change Request

MMO Initial Comment	Applicant's Response	MMO comments
Underwater Noise *The MMO previously provided advice on the ES, which appropriately recognised that noise and vibration could occur as a result of impact piling, vibro-piling, capital dredging, vessel movements and the demolition of the Belvedere Power Station Jetty (disuses) if undertaken. An underwater noise assessment was also provided (Appendix 6-4) to support the ES. The MMO, in consultation with Cefas, had several queries regarding the assessment presented in this Appendix which still remain, and therefore request that these comments are addressed.* *It was also requested that further clarity be provided regarding the piling scenarios presented in the assessment. For vibro-piling, the assessment considered a total of 15 piles installed per day, with a duration of 20 minutes per pile. However, for the impact piling scenario, the assessment was based on the installation of only a single pile per day (with piling activity taking place for 30 minutes per day). It is the MMO's understanding that the total duration of vibro-piling per day is to be confirmed.*	The Applicant responded to the MMO's queries regarding underwater noise with regard to piling within the Applicant's Responses to Relevant Representations (AS-043). The Applicant has submitted Revision B of the Outline CoCP (AS-029) which contains updated mitigation measures, as discussed with the MMO on 19th August 2024, specifically "no impact piling will occur at night, and piling activity will not be continuous (limited to 30 minutes per day for percussive piling), so a window for upstream migration will be available". As described within Table 4-1 of the main report, there are no anticipated changes to the vibro-piling and impact piling, specifically: "vibro-piling: Up-to 15 piles per day to be installed. Each pile has been assumed to take 20 minutes of continuous vibratory piling until refusal based on experience on similar projects. Impact Piling: 1 pile per day would be installed using impact piling. It was assumed that each pile required 900 strikes to refusal, based on experience on similar projects." These parameters are considered conservative and representative of a typical worst case scenario with the Change in place.	The Applicant's Responses to Relevant Representations have been reviewed – please refer to Table 1 of this response where these responses are addressed. Regarding the proposed Change to the original application submitted: "*As described within Table 4-1 of the main report, there are no anticipated changes to the vibro-piling and impact piling*", the MMO is not clear what the 'main report' is, and no reference is provided for this. Thus, we are unable to confirm at this time that the Change has been assessed in an appropriate and proportionate manner.
The MMO recommends that the proposed changes are appropriately assessed, and evidence is presented to demonstrate why the change is not likely to result in changes to the significance of effects. For example, it could be confirmed whether	The Applicant confirms that the Change has been assessed in an appropriate and proportionate manner. The rows above respond to each of the comments made by the MMO.	As above, the MMO is not clear what the 'main report' is, and no reference is provided for this. Thus, we are unable to confirm at this time that the Change

or not there will be any changes to the piling scenarios and the predicted effect ranges presented in the assessment. However, with the proposed mitigation, the MMO believes the proposed changes are unlikely to cause significant effects beyond those reported in the ES	Further detail with regard to the likely effect the Change would have on the Environmental Statement is provided in Table 4-1 of the main report.	has been assessed in an appropriate and proportionate manner.

4. References

JNCC, M.A., House, I. and Street, B., 2010. Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise.

Maitland, P. S. (2003). The status of smelt Osmerus eperlanus in England. English Nature.

ZSL, 2019. A baseline study of larval and juvenile fish in the Tidal Thames. Summary report, Zoological Society of London, November 2019.

ZSL Bournemouth University & SC2. (2020). 'Thames Tideway Aquatic Ecology Research – Smelt Surveys on the Thames'.