HORIZON NUCLEAR POWER

WYLFA NEWYDD

ENERGY WORKING FOR BRITAIN

Wylfa Newydd Project

Request for Non-Material Change no.4 Working Hours

PINS Reference Number: EN010007

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Revision 1.0

Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Contents

List of Appendices

List of Tables

List of Figures

1 Introduction

1.1 Purpose of this report

1.1.1 Horizon Nuclear Power Wylfa Limited ("Horizon") is proposing a non-material change relating to the working hours during the construction phase of the Wylfa Newydd Project ("the Project").

1.1.2 Horizon is seeking to extend the working hours for specified activities of Main Construction into the evening (up to 23:00 hours) and for other activities to 24 hours. As a result of the proposed change to working hours, Horizon has assessed consequential changes to the haul routes detailed in the Project's Development Consent Order application ("DCO application"). Details of all aspects of the proposed change are provided in section 2.2 of this document.

1.1.3 The proposed change relates to the construction phase of the WNDA Development (i.e. the Power Station, Site Campus, Marine Works and other on-site developments), and has been assessed against relevant parts of the DCO application to determine whether it would result in any new or different likely significant environmental effects. The details of the proposed change have been carefully considered to ensure that work activities covered by the change can be undertaken with minimal environmental effects. Where there is considered potential for new or different effects to occur as a consequence of the proposed change, new and/or enhanced mitigation has been proposed to enable an overall conclusion of 'no new or different likely significant environmental effects' to be reached.

1.1.4 This report sets out the proposal for this non-material change to the Project's DCO application that was submitted by Horizon and accepted for Examination by the Secretary of State for Business, Energy and Industrial Strategy on 28 June 2018. The DCO application is currently in the Examination phase.

1.1.5 Recipients of this report are invited to provide representations on the proposed non-material change to Horizon by Thursday 6 December 2018. Feedback will be via Horizon's freepost address (FREEPOST WYLFA NEWYDD, no stamp required) or by emailing wylfaenquiries@horizonnuclearpower.com. If you have any questions about the consultation, please call 0800 954 9516.

1.1.6 Following completion of consultation, Horizon will have regard to the responses received and update this document as appropriate. The updated report will then be submitted to the Examining Authority as a request for the non-material change to be considered for acceptance into Examination by the Examining Authority (with the opportunity for Interested Parties to make further representations in Examination accordingly).

1.1.7 This document uses terms and definitions that are taken from and can be seen in the DCO General Glossary (APP-006).

1.2 Scope of this report

1.2.1 This report describes the proposed change, the justification for it being sought and the environmental appraisal of this proposed change. It includes a table (Table 2-12) clearly setting out the implications of the proposed change to the assessments detailed in the DCO application, and a statement on any new or different likely significant environmental effects (if any) of the proposed change.

1.2.2 This report also includes a 'schedule of engagement' (Table 2-13) identifying the parties expected to have an interest in this proposed change and how Horizon is engaging with them.

1.2.3 Finally, a 'schedule of consequential amendments' (Table 2-14) is provided, listing the original application documents (or parts thereof) which would need to be amended by Horizon should the Examining Authority accept the proposed change into Examination.

1.2.4 Horizon's objective in compiling this report is to ensure that stakeholders are provided with sufficient information to comment on the proposed change and, after consultation, for the Examining Authority to be able to make a decision on whether or not the proposed change may be accepted and therefore included in the Examination of the DCO application.

1.2.5 However, should the Examining Authority require any further relevant additional information in support of this report, Horizon will endeavour to provide it as soon as possible in response to any request for such information.

1.3 Non-materiality of the proposed change

1.3.1 In assessing the proposed change, Horizon has had regard to the advice contained in the Planning Inspectorate's Advice Note 16: *How to request a change which may be material* (Version 2, March 2018) [RD1].

1.3.2 In determining the materiality of the change, Horizon reviewed the Environmental Statement including the following topic chapters and their associated appendices to determine whether or not there were any new or different likely significant effects resulting from the proposed change in relation to:

- air quality (excluding emissions from traffic) (chapter D5, APP-124);
- noise and vibration (chapter D6, APP-125);
- terrestrial and freshwater ecology (chapter D9, APP-128);
- Environmental Lighting Impact Assessment (appendix D10-10, APP-201);
- the marine environment (chapter D13, APP-132);
- combined topic effects (chapter D16, APP-135);
- intra-project cumulative effects (chapter I4, APP-387); and
- inter-project cumulative effects (chapter I5, APP-388).

1.3.3 The details of the proposed change have been carefully considered to ensure that the change can be undertaken with minimal environmental effects. Where there is considered potential for new or different effects to occur as a consequence of the proposed change, new and/or enhanced mitigation has been proposed to enable an overall conclusion of 'no new or different likely significant environmental effects' to be reached.

1.3.4 Further consideration has also been given to the potential effect of the proposed change on the assessments contained in the following reports submitted as part of the DCO application:

- Health Impact Assessment Report (APP-429);
- Equality Impact Assessment (APP-434); and
- Shadow Habitats Regulations Assessment Report (APP-050/051).

1.3.5 With consideration of the new and/or enhanced mitigation which has been proposed to address potential noise and light impacts to human health and equality, a conclusion of 'no new or different likely significant effects' to human health and equality has been reached and assessments remain as reported in the DCO application. No new or differently likely significant effects have been identified in relation to the Shadow Habitats Regulations Assessment Report (APP-050/051) and therefore the conclusions would remain as reported in the DCO application.

1.3.6 On the basis of the information presented here and in subsequent sections of this document, it is not anticipated that the proposed change alters the Project to such a degree that it is a materially different project.

Cumulative effects

1.3.7 Horizon intends to make a request for a total of five non-material changes to the Project DCO application. Horizon has already consulted and submitted the following two non-material change requests:

- Request for Non-Material Change no.1 – Blasting Strategy (AS-012); and
- Request for Non-Material Change no.2 – Marine Vessel Movements (AS-013).

1.3.8 In addition to the non-material change (no.4) described in this document, Horizon has gone out to consultation with respect to two further non-material change requests:

- Request for Non-Material Change no.3 – Worker Shift Patterns; and
- Request for Non-Material Change no.5 – HGV delivery window.

1.3.9 The implications of each proposed change to the cumulative assessment reported in the DCO application is considered and assessed within each individual document.

1.3.10 The cumulative assessment is provided in Appendix 1-1. Based on the information presented, it is not anticipated that the proposed change outlined in this report will interact with the other non-material changes being sought to

produce any new or different likely significant environmental effects resulting from the interaction of these changes either in combination or cumulatively with any other projects.

1.3.11 Taking the above factors into account, and subject to the representations received in response to this consultation, Horizon therefore considers that the proposed change to working hours and the consequential changes to haul routes should be regarded as a non-material.

1.4 Engagement and consultation on the proposed change

1.4.1 Following notification of its intention to submit a written request for non-material change on Wednesday 17 October (AS-011), Horizon is consulting on the proposed change to ensure that all persons that are potentially affected have sufficient opportunity to provide their views.

1.4.2 Consultation on the proposed change will run for a period of 28 days commencing Thursday 8 November 2018 and ending on Thursday 6 December 2018. In order to facilitate this engagement in the consultation, Horizon has:

- notified prescribed persons under section 42(a)-(d) of the Planning Act 2008, and any other person identified by Horizon as potentially affected, or the consultation process and invite their views;
- publicly notified the consultation in the London Gazette and over two successive weeks in The Daily Post; and
- carried out targeted mail drops at residential addresses and erected site notices near the affected area.

1.4.3 Section 2.7 identifies the parties expected to have an interest in this proposed change and how Horizon is engaging with them.

1.4.4 As the proposed change does not require any 'additional land', Horizon does not consider that the consent of persons with an interest in the relevant land is required under the Infrastructure Planning (Compulsory Acquisition) Regulations 2010.

1.4.5 Copies of the consultation documents are available for public viewing at:

- The Anglesey Business Centre, Isle of Anglesey County Council, Bryn Cefni Business Park, Llangefni, Anglesey, LL77 7XA, Monday to Friday 9am to 5pm, and
- Wylfa Newydd Site Office, Cemaes Bay, Anglesey, LL67 0AA, Monday to Friday 9am to 5pm by appointment only, or
- on Horizon's consultation website, www.horizonnuclearpower.com/consultation.

1.5 Proposed procedure after consultation

1.5.1 Following consultation, Horizon will have regard to the responses received and will review and update this document as appropriate. We will then submit the revised version to the Examining Authority as a formal written request for a non-material change to the DCO application. Horizon expects that it will be able to submit this formal written request to the Examining Authority by Examination Deadline 3 (18 December 2018) or Examination Deadline 4 (17 January 2019). Responses received during consultation would be summarised in, and appended, to the written request for non-material change to demonstrate how Horizon has had regard to these responses.

1.5.2 Horizon acknowledges that the acceptance and procedure for consideration and examination of the proposed changes is entirely at the discretion of the Examining Authority. However, if the Examining Authority is minded to accept the proposed changes into the Examination, Horizon considers that the remainder of the Examination period would provide sufficient time for Interested Parties to consider and make representations on the published proposed changes to the Examining Authority and for any other procedural requirements to be met. Such representations could be required to be submitted by Deadline 5 (Tuesday 12 February 2019).

1.5.3 Horizon also considers that, with the proposed change, the DCO application, would still be of a sufficient standard for Examination and any other procedural requirements can still be met.

2 Non-Material Change: Working Hours

2.1 Background to the proposed change

2.1.1 During Main Construction of the proposed Wylfa Newydd Power Station, a number of different site construction operations will be required and Horizon has proposed to undertake them in the days and times stipulated in Table D1-7 of chapter D1 (APP-120) of the Environmental Statement and secured in the Wylfa Code of Construction Practice (APP-414) and the Main Power Station Site sub-Code of Construction Practice ("sub-CoCP") (APP-415). These working hours are presented in Table 2-1 below. Most operations are assumed to be undertaken during the working hours 07:00-19:00 with specified exceptions, such as blasting, tunnelling and other operations.

Table 2-1 Site operation hours assumed in chapter D1 (APP-120) submitted as part of the DCO application and secured in the Main Power Station Site sub-CoCP (APP-415).[1]

Site operation	Working hours
Earthworks (digging, hauling, dumping, back-filling, stockpiling)	07:00–19:00 hours
Temporary/permanent road construction	07:00–19:00 hours
Blasting	Monday to Friday 10:00–16:00 hours, and Saturday 10:00–13:00 hours
Marine piling	07:00–18:00 hours
Drilling and packing for blasting	07:00–19:00 hours
Drilling/stuffing/grouting rock/soil nails	07:00–19:00 hours
Moving/re-positioning rock in the excavations	07:00–19:00 hours
Tunnelling	24 hours, seven days a week
Shotcreting	24 hours, seven days a week
Support operations (e.g. equipment/road maintenance, fuelling, dewatering, etc.)	07:00–19:00 hours, except from dewatering which would be 24 hours a day, seven days a week
Marine dredging	24 hours, seven days a week
Marine Off-Loading Facility (MOLF) construction	07:00–18:00 except crane, barges, tugs which are 24 hours, seven days a week
Site establishment (facilities/utilities set-up)	07:00–19:00 hours
Batch plant set-up	24 hours, seven days a week
Miscellaneous construction operations (training, canteens, facilities management, etc.)	Generally, 24 hours, seven days a week

[1] Unless specified otherwise, works were assumed to be carried out seven days a week.

2.1.2 The assessments for the DCO application were based on an indicative construction plant list/schedule. This indicative plant list/schedule formed the basis of the assessment for air quality (chapter D5, APP-124), noise and vibration (chapter D6, APP-125) and the Environmental Lighting Impact Assessment (appendix D10-10, APP-201) presented in the Environmental Statement. An extract of the plant list/schedule used for the noise modelling and assessment presented in the DCO application is provided in Table 1-2 of appendix D6-1 (APP-142) of the Environmental Statement. Information from the plant list/schedule relevant to the air quality assessment presented in the DCO application is provided in Appendix A of appendix D5-2 (APP-140) of the Environmental Statement.

2.1.3 Since the preparation and submission of the DCO application, Horizon has undertaken additional work to further analyse and consider the programme and logistical implications of the working hours proposed in the DCO application. This review has been necessitated by a number of factors including:

- rationalisation of the preferred delivery model for the Project (shift from a joint venture to project management contractor structure which resulted in Horizon becoming responsible for logistical arrangements); and
- the appointment of, and engagement with, the project management contractor.

2.1.4 This review has involved Horizon and the project management contractor analysing how and when construction activities will be undertaken on-site, and the potential implications of the working hours on workforce safety, contingency arrangements, and preferred construction methodologies.

2.1.5 As a result of these discussions, Horizon is proposing a change to working hours for specific construction operations (i.e. an extension of working hours into evenings or 24 hours) during the construction phase of the Project. Further description of the proposed change is provided in section 2.2.

2.2 Description of the proposed change

2.2.1 To enable resilience and flexibility to be built into the Project schedule, Horizon is seeking to extend the working hours for specified activities of Main Construction into the evening (up to 23:00 hours) and for other activities to 24 hours. The proposed changes to working hours are summarised in Table 2-2 alongside working hours submitted in the DCO application.

2.2.2 It should be noted that the working hours for earthworks (excluding site grading in specific areas of the site as detailed in Table 2-2) presented in the DCO application would remain unchanged (i.e. 07:00–19:00 hours).

Table 2-2 Working hours as submitted in the DCO application and the proposed change to these[2]

Construction activities	DCO Working hours	Proposed change
Marine piling	All piling 07:00–18:00 hours	Percussion piling 07:00–19:00 hours. Sheet piling 24 hours
MOLF construction	All relevant plant 07:00–18:00 hours, except marine plant (24 hours)	All plant, 24 hours.
Preparation for blasting including rock drilling and packing for blasting	All plant 07:00–19:00 hours	24 hours, seven days per week construction operations for deep excavations.
Drilling and rock anchoring in excavations including application of shotcrete to stabilise open faces	All plant 07:00–19:00 hours	24 hours, seven days per week construction operations for deep excavations.
Moving/repositioning won rock in the excavations both from the marine area (zone 10) and from unit 1 (zone 4) and unit 2 (zone 8). This material will move to areas around the deep excavation and for the construction of the MOLF. No material will be taken to the mounds.	All plant 07:00–19:00 hours	All of the plant identified in the schedule will be operating 07:00–19:00 hours, whilst only half the plant (50%) identified in the schedule will operate 19:00–23:00 hours and 23:00–07:00 hours. Material in zone 10 will be placed only as far as breakwater (24 hours)
Support operations which covers a range of activities required to support the early works and Main Construction (e.g. equipment/road maintenance, fuelling, movement of equipment and materials, cleaning).	All plant 07:00–19:00 hours or 06:00–20:00 hours	All plant 24-hour operation.
Site grading in construction zones 6, 7, 8 and 9 and the transportation of resultant material on haul routes HR-011, HR-B1 and HR-B2 for the construction of Mound E and Mound B. This work would occur in months 1-12 of construction	All plant 07:00–19:00 hours	All plant 07:00–23:00 hours.

[2] Unless specified otherwise, constructions activities are assumed to be seven days a week.

2.2.3 As a consequence of the proposed change and to reduce the potential environmental effects, additional haul routes within the Order Limits are proposed, which form the basis of the further modelling and assessment of the proposed change (see Figure 2-1 and Figure 2-2 for before and after extracts and Appendix 1-2). These include:

- two new circular haul routes (HR-B1 and HR-B2) situated to the west of Tregele in construction zone 9, and one new haul route from construction zone 9 to Mound E (HR-011); these will primarily be used to transport bulk material arising from site grading during the first year of construction to provide fill material needed to construct Mound B1 and E;
- a new haul route from the south extent of the deep excavations (construction zones 4 and 8) to construction zone 6 (HR-012), where rock processing equipment will be situated, which will be used primarily at night so as to avoid plant movements near sensitive receptors;
- two new haul routes from the south extent of the deep excavations (construction zones 4 and 8) to construction zones 2 and 10 (HR-013), and from the north extent of the deep excavations (construction zones 4 and 8) to construction zones 2A and 2 (HR-014); these will enable the transportation of rock arising from the excavations to the Marine Works and which will be used primarily at night.

2.2.4 To reduce the potential environmental effects associated with the proposed change to working hours, a small number of amendments have also been made to the indicative plant list/schedule which formed the basis of the modelling and assessments reported in the DCO application. These amendments relate to plant numbers and sequencing of activities - see paragraph 2.5.33 onwards for further information.

Figure 2-1 Before proposed change to haul routes (i.e. as per DCO application)

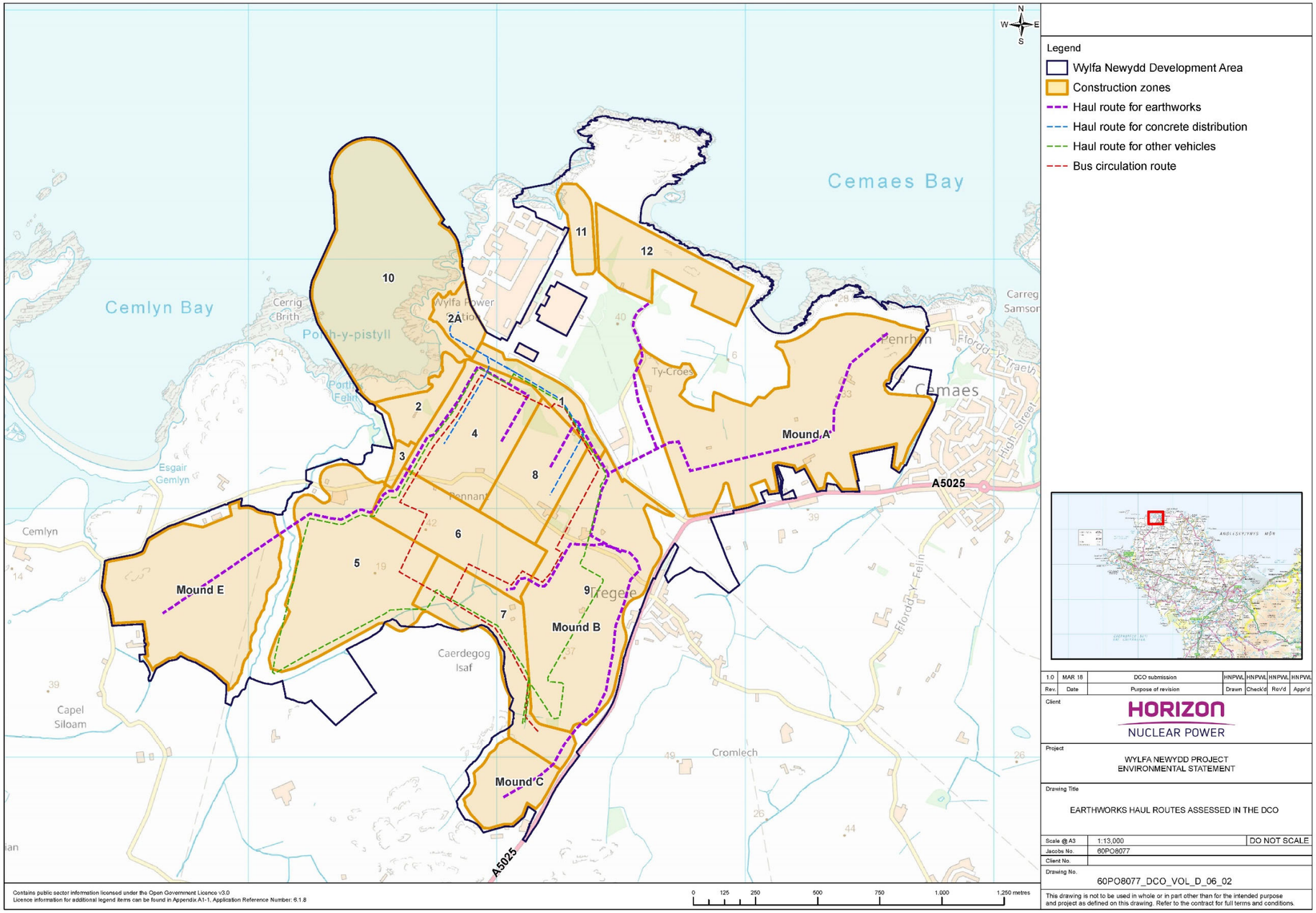
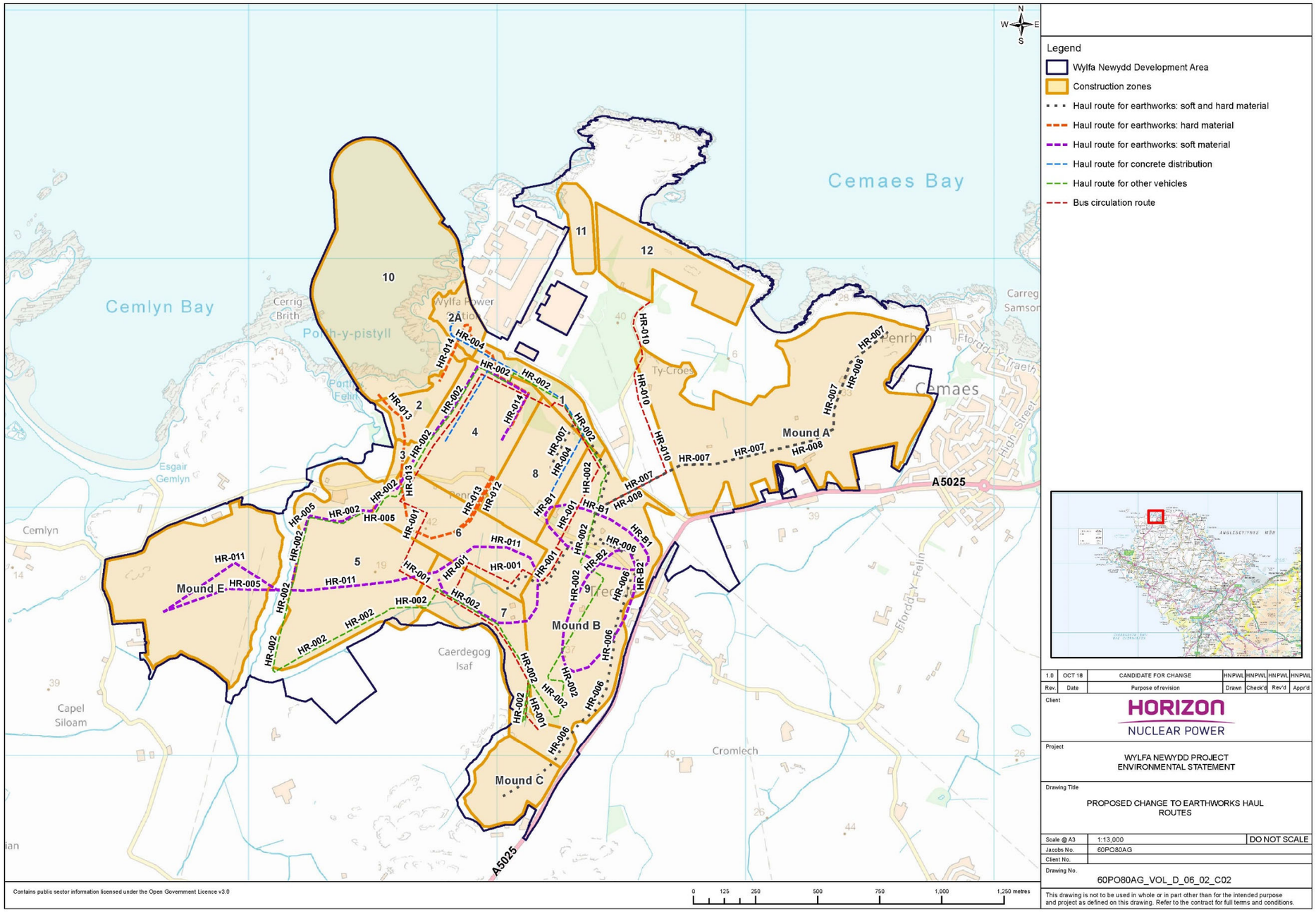


Figure 2-2 After proposed changes to haul routes



2.3 Justification for the proposed changes

Improving the resilience of the construction programme

2.3.2 The proposed change to working hours will enable Horizon to build flexibility and resilience into its construction programme. Currently, the hours proposed in the DCO application provide limited contingency for delays from weather events, equipment or plant breakdown, or unplanned ground conditions. Allowing the extended working hours would provide greater flexibility and ability to recover from any unexpected delays in the construction programme.

Urgent need for new nuclear

2.3.3 By changing the working hours and improving the resilience of the construction programme, the proposed change will enable Horizon to assist the UK Government in meeting its energy security and carbon reduction objectives through the delivery of this nationally significant infrastructure project. The urgent need for new nuclear has been firmly established in National Policy Statements EN-1 [RD2] and EN-6 [RD3] and the recent Ministerial Statement on Energy Infrastructure (December 2017) [RD4] which confirms the Government's continued support for new nuclear power generation post-2025.

Reduces the length of effects on the local community and ecological receptors

2.3.4 In addition to providing Horizon with increased flexibility, the increase in working hours will mean that Horizon has the flexibility to either complete construction activities more quickly or undertake construction on a less intensive basis over a longer period. Both options would result in the magnitude and duration of overall effects experienced by surrounding receptors being reduced.

2.3.5 For example, it is shown in Table 2-8 below with the proposed change there would be a net of 79 fewer residential receptors that would be subject to a major adverse noise effect. Whilst a small number of residential receptors have been identified to increase these would be fewer in number and taking account of the enhanced mitigation being offered (see paragraph 2.5.48), overall the proposed change is considered to result in a better situation than currently presented in the DCO application.

2.4 Summary of environmental appraisal

2.4.1 The proposed change has been reviewed and assessed in order to identify whether it is likely to result in any new of different likely significant effects to those assessed in the DCO application. This information is summarised in Table 2-12; where relevant, further discussion is provided below.

Environmental Statement

2.4.2 This review identified that the proposed change could potentially have implications for the following topic assessments outlined in the Environmental Statement submitted as part of the DCO application:

- air quality (excluding emissions from traffic) (chapter D5, APP-124);
- noise and vibration (chapter D6, APP-125);
- terrestrial and freshwater ecology (chapter D9, APP-128);
- Environmental Lighting Impact Assessment (appendix D10-10, APP-201);
- the marine environment (chapter D13, APP-132);
- combined topic effects (chapter D16, APP-135);
- intra-project cumulative effects (chapter I4, APP-387); and
- inter project cumulative effects (chapter I5, APP-388).

2.4.3 Based on the information presented within this document (including proposed new and/or enhancement mitigation), the overall conclusions of these assessments remain unchanged and there are no new or different likely significant effects identified.

2.4.4 As shown in Table 2-2 the proposed change would not affect all construction activities and therefore all the remaining topic assessments detailed within volume D of the Environmental Statement are not considered to be affected by the proposed change and thus, the conclusions remain as reported in the DCO application.

2.4.5 The proposed change only relates to on-site construction activities associated with the Wylfa Newydd Development Area, and therefore only has implications to assessments outlined in volume D (WNDA Development). Thus, there are no further implications for receptors assessed in volumes C and E to H of the Environmental Statement.

2.4.6 The potential effect of all five requests for non-material change to the DCO application (see paragraphs 1.3.7 and 1.3.8 for details of these) to the cumulative assessment reported in the Environmental Statement is assessed in Appendix 1-1.

Other Assessments

2.4.7 Further consideration has also been given to the potential effect of the proposed change to the following assessments reports submitted as part of the DCO application:

- Health Impact Assessment Report (APP-429);
- Equality Impact Assessment (APP-434); and
- Shadow Habitats Regulations Assessment Report (APP-050/051).

2.4.8 Based on the information presented within this document (including proposed new and/or enhanced mitigation), the overall conclusions of these

assessments remain unchanged and there are no new or different likely significant effects identified.

2.4.9 All other assessments submitted as part of the DCO application (e.g. Welsh Language Impact Assessment, APP-432; and Water Framework Directive Compliance Assessment, APP-444) would remain unaffected by the proposed change and have therefore not been considered further.

2.5 Topic assessments

2.5.1 The effects of the proposed change to the assessments listed in paragraphs 2.4.2 and 2.4.9 above are summarised in Table 2-12, with further discussion provided below where relevant.

Air quality

2.5.2 Additional air quality mitigation was proposed in chapter D5 (APP-124) of the Environmental Statement due to potentially significant effects with regard to emissions of oxides of nitrogen (NOx) from construction plant, machinery and marine vessels. This is secured in the Main Power Station Site sub-CoCP (APP-415) and included, among other elements, a commitment to utilise newer non-road mobile machinery (NRMM) with lower NOx emissions. It was not possible to quantify the reduction in pollutant concentrations or deposition rates as a result of utilising newer, lower emitting plant within the Environmental Statement.

2.5.3 Since submission of the DCO application, further work has been undertaken to quantify the effects of the additional air quality mitigation secured in the DCO application. The air quality modelling assessment for both scenario years (i.e. year 2 and year 5) presented in chapter D5 (APP-124) of the Environmental Statement has been updated to incorporate the additional mitigation, the results of which represent the quantified residual effects as applicable to the DCO application.

2.5.4 A report setting out the additional modelling results and assessment will be submitted into Examination at Deadline 3 for consideration by the Examining Authority. Further details relating to the additional mitigation described in paragraph 2.5.2 that have become available since submission of the DCO application, will be secured in an update to the Main Power Station Site sub-CoCP (APP-415) which will also be submitted into Examination at Deadline 3.

2.5.5 For the purpose of this assessment, it is considered more appropriate to assess the effect of the proposed change against the quantified residual effects described above rather than the results presented in chapter D5 (APP-124) of the Environmental Statement.

2.5.6 The modelled scenarios considered in the assessment of the proposed change are the same as that assessed in the DCO application and included year 2 (i.e. peak earthworks and Marine Works) and year 5 (peak Power Station construction). Air quality dispersion modelling was undertaken to determine the likely effect of the proposed change for these air quality scenarios. The results are considered to overestimate the predicted concentrations and deposition rates at human and ecological receptors due to

some of the assumptions made within the model. As these modelling results are considered to represent a worst case it was deemed appropriate to use these to estimate the likely effect of the proposed change on the DCO application residual effects.

2.5.7 A description of the air quality assessment for human and ecological receptors is provided in the following sections. Before and after extracts showing changes to the new haul routes relative to air quality receptors are shown in Appendix 1-2 (see Figure 3-1 and Figure 3-2). The overall conclusions of the effects of the proposed change on the quantified residual effects of the DCO application are summarised in paragraphs 2.5.27 and 2.5.32.

Human receptor locations

2.5.8 The proposed change (taking account of the additional mitigation outlined in paragraph 2.5.2 above) does not alter the effects described for particulate matter (PM_{10}, $PM_{2.5}$), sulphur dioxide (SO_2) and carbon monoxide (CO) at human receptors in year 2. These remain negligible adverse and concentrations were well within the relevant Air Quality Objectives (AQOs) and Environment Assessment Levels (EALs). The same applies to year 5. Therefore, $PM_{2.5}$, SO_2 and CO are not considered further for human receptors and the focus is on the predicted concentrations of NO_2.

2.5.9 Considering the proposed change, predicted concentrations of NO_2 would remain well within the AQOs however, maximum concentrations would increase at some locations resulting in an increase in the number of small and medium effects for both year 2 and year 5 (see Table 2-3) compared to quantified residual effects. However, these are relatively modest changes and there are no changes in the number of large effect descriptors. The balance of effects remains predominantly negligible at long-term human receptors and negligible and small adverse at short-term receptors.

2.5.10 The proposed change would likely lead to increases in the predicted concentrations at receptors in Tregele and Cemaes for year 2. However, the increases are relatively small, with the highest total annual mean NO_2 concentration for year 2 increasing from 11.5µg/m^3 (receptor R4 see receptor locations in Figure 3-2) to 12.5µg/m^3 (receptor R6). The highest increase at the receptors representing Cemaes and Tregele (R1 to R7 and R9) is 14% of the AQO (R7), compared to 6% for the DCO residual effects. However, only at one receptor would the increase result in a change from negligible or small adverse to medium adverse (R7) as a consequence of the proposed change. The remaining receptors representing Cemaes and Tregele are predicted to experience a negligible or small adverse effect for year 2.

2.5.11 Based on the initial modelling for year 2, some decreases in the annual mean NO_2 concentrations are expected at some of the western receptors (R12 – R14) due to the proposed change. The concentration at receptor R15, close to receptor R14, is predicted to increase slightly (increase of 0.3µg/m^3 to 10.2µg/m^3). Similar increases are predicted for the remaining receptors (R10, R11, R16 and R17) with the highest total concentration predicted to be 7.5µg/m^3 at receptor R10.

2.5.12 The proposed change would not significantly alter the predicted 99.8th percentile of one-hour mean NO_2 concentrations for year 2, with values following a relatively similar pattern to the annual mean concentrations. The predicted concentrations would show some increases at receptors in Tregele and Cemaes, increasing from a maximum of 43µg/m^3 (receptor R6) to a maximum of 57µg/m^3 (receptor R7). There are expected to be decreases for long-term receptors close to Mound E (R11 – R15), due to the proposed change, with the highest concentration decreasing from 69µg/m^3 to 57µg/m^3.

2.5.13 At short-term receptor locations (e.g. footpaths, commercial/industrial residential receptors) there are predicted to be increases and decreases in the 99.8th percentile of one-hour mean concentrations as a consequence of the proposed change for year 2. The maximum concentration of 111µg/m^3 is predicted to increase to 149µg/m^3 at receptor R19. However, the increases are much smaller (i.e. <10µg/m^3) at all other short-term receptors and a decrease of approximately 20µg/m^3 is forecast at Cestyll Gardens (receptor R25), where the total concentration of 83µg/m^3 for year 2.

2.5.14 With regard to the modelling results for year 5, Table 2-3 shows the proposed change leads to minor changes to the effects with these remaining predominantly negligible. Only a very small number of long-term receptors would be described as non-negligible for the annual mean and 99.8th percentile of one-hour mean NO_2 concentrations.

2.5.15 Compared to the quantified residual effects for year 5, the maximum total concentrations would increase slightly to 10.3µg/m^3 (receptor R4) and 32.5µg/m^3 (receptor R10) for the annual and 99.8th percentile of one-hour mean concentrations, respectively. However, these concentrations are well below the respective AQOs. The maximum 99.8th percentile of one-hour mean concentration at any of the short-term receptors would be 62.8g/m^3 (receptor R22). The concentrations at the remaining short-term receptors range from 32.7µg/m^3 to 45µg/m^3.

2.5.16 In summary, the proposed change in both year 2 and year 5 would generally worsen the description of effects for NO_2 when compared to the quantified residual effects. However, these remain predominantly negligible at long-term human receptors and negligible and small adverse at short-term receptors. The proposed change would lead to some increases in NO_2 concentrations at Cemaes and Tregele and decreases at other receptors on the western side of the Wylfa Newydd Development Area. Although the maximum concentrations would increase at some locations, the concentrations are well within the AQOs. On the above basis, the proposed change would not alter the conclusion of the DCO application that air quality effects are not significant, with regard to NO_2.

Table 2-3 Number of human receptors experiencing predicted effects from emissions to air from the construction plant, machinery and marine vessels due to the proposed change for the year 2 and year 5 assessment scenarios

Averaging period and receptor type	Effect descriptor	Number of receptors experiencing predicted effects			
		Year 2		Year 5	
		Quantified residual effects from DCO	Proposed change	Quantified residual effects from DCO	Proposed change
Annual mean NO_2 – long term receptors	Large	0	~0	0	~0
	Medium	2	~3	1	~1
	Small	5	~64	1	~3
	Negligible	1,220	~1,160	1,226	~1,224
One-hour mean NO_2 (99.8th percentile) – long-term receptors	Large	0	~0	0	~0
	Medium	3	~2	1	~0
	Small	76	~91	0	~2
	Negligible	1,148	~1,134	1,227	~1,226
One-hour mean NO_2 (99.8th percentile) – short-term receptors	Large	3	~2	0	~0
	Medium	38	~41	1	~7
	Small	134	~128	20	~30
	Negligible	252	~256	406	~390

Ecological and cultural heritage receptor locations

2.5.17 A number of ecological receptors were identified in the terrestrial and freshwater ecology chapter (chapter D9, APP-128) of the Environmental Statement where further consideration was required due to the predicted changes in NO_x concentrations to nitrogen and acid deposition (the criteria for identifying when further consideration is required are set out in chapter B5 (APP-070), of the Environmental Statement, paragraphs 5.4.146 to 5.4.149). With quantification of the additional mitigation already secured in the DCO application (see 2.5.2), the number of ecological receptors above the relevant criteria and requiring further consideration reduces to two sites:

- Cae Gwyn Site of Special Scientific Interest (SSSI) (year 2 for nitrogen deposition); and
- Tre'r Gof SSSI (year 2 and year 5 for both nitrogen and acid deposition).

2.5.18 Based on the quantified residual effects which take account of the additional mitigation secured in the DCO application, the predicted annual mean and maximum 24-hour mean NOx concentrations at all ecological receptors were below the criteria for requiring further consideration in the terrestrial and freshwater ecology chapter (chapter D9, APP-128) of the Environmental Statement.

2.5.19 Where appropriate, the assessment of changes in NOx concentrations and nitrogen and acid deposition were also considered at Cestyll Gardens which is a cultural heritage receptor (see chapter D11 (APP-130) of the Environmental Statement). As for the other ecological receptors, the application of the additional mitigation reduced NOx concentrations to below the criteria for requiring further mitigation. Nitrogen and acid deposition continued to require further consideration (in the absence of specific critical loads).

2.5.20 A summary of the maximum predicted nitrogen and acid deposition at ecological receptors for year 2 is shown in Table 2-4 and Table 2-5; and for year 5 this is shown in Table 2-6 and Table 2-7. These tables show only those receptors which were above the relevant criteria and/or considered further within the revised assessment of the quantified residual effects as applicable to the DCO or as a result of the proposed change (i.e. Cae Gwyn SSSI, Tre'r Gof SSSI and Cestyll Garden).

2.5.21 There were no new receptors which are above the criteria for requiring further consideration for a particular pollutant due to the proposed change. Results for a specific pollutant which are above the criteria for requiring further consideration in the terrestrial and freshwater ecology assessment or cultural heritage assessment (i.e. Cestyll Gardens) are shown with an asterisk.

2.5.22 The effect of the proposed change to predicted annual mean and 24-hour mean NOx concentrations for year 2 would not lead to any of the ecological receptors requiring further consideration as part of the terrestrial and freshwater ecology assessment (i.e. the increases due to the proposed change are relatively small and both sites, Cae Gwyn SSSI and Tre'r Gof

SSSI, do not require further consideration for NOx) (see Table 2-4 and Table 2-5). The same also applies for Tre'r Gof SSSI for year 5 (see Table 2-6 and Table 2-7).

2.5.23 Predicted nitrogen deposition rates for year 2 would increase slightly as a result of the proposed change, however, the increases are relatively small (see Table 2-4) and Cae Gwyn SSSI and Tre'r Gof SSSI would remain as requiring further consideration within the terrestrial and freshwater ecology assessment. Nitrogen and acid deposition rates for year 5 are predicted to increase slightly due to the proposed change (see Table 2-6 and Table 2-7). As for year 2, Tre'r Gof SSSI remains as requiring further consideration for both nitrogen and acid deposition. The proposed change leads to small increases in nitrogen and acid deposition at Cae Gwyn SSSI which are above the relevant criteria for requiring further consideration in the terrestrial and freshwater ecology assessment (see paragraph 2.5.51 onwards).

2.5.24 A similar outcome is observed for the predicted acid deposition rates for year 2 (Table 2-5), where the proposed change leads to minor increases in the deposition rates. Tre'r Gof SSSI remains as requiring further consideration in the terrestrial and freshwater ecology assessment and the small increase due to the proposed change also leads to Cae Gwyn SSSI requiring further consideration (see paragraph 2.5.51 onwards).

2.5.25 With regards to Cestyll Gardens, although some increases are observed due to the proposed changes, these are considered to be very small (a maximum of 0.5 keq/ha/year increase in nitrogen deposition and 0.15 keq/ha/year increase in acid deposition affecting tall vegetation in year 5 peak Power Station construction). The proposed change does not result in predicted NOx concentrations at Cestyll Gardens which are above the criteria for requiring further consideration within the cultural heritage assessment and the effects remain negligible as reported in chapter D11 (APP-130) of the Environmental Statement. Further consideration of this receptor is required for year 2 and year 5 with regard to nitrogen and acid deposition (see Table 2-4, Table 2-5, Table 2-6 and Table 2-7).

2.5.26 Modelling of the proposed change forecasted no new exceedances of the critical loads at any receptors.

Table 2-4 Year 2 peak earthworks and Marine Works – magnitude of annual mean nitrogen deposition rate changes at key ecological receptors

Ecological receptor	Quantified residual effects from DCO		Proposed change	
	Change as a percentage of CL	Total deposition as a percentage of CL	Change as a percentage of CL	Total deposition as a percentage of CL
Cae Gwyn SSSI	+2% (*)	101% (*)	+~2% (*)	~102% (*)
Tre'r Gof SSSI	+9% (*)	139% (*)	+~10% (*)	~141% (*)
Cestyll Gardens (short vegetation)[2]	+1.4 (*)	11.3 (*)	+~1.5 (*)	~11.4 (*)
Cestyll Gardens (tall vegetation)[2]	+2.7 (*)	18.7 (*)	+~3.0 (*)	~18.9 (*)

[1] CL = critical load (i.e. the environmental criteria for nitrogen or acid deposition)

[2] Cestyll Gardens – values shown are the nitrogen deposition rates in kN/ha/year as no critical load available

Values shown with asterisks in brackets denote results which are above the criteria for requiring further consideration in the terrestrial and freshwater ecology assessment (or require consideration as part of the cultural heritage assessment (Cestyll Gardens))

Note: "~" is used to denote that the results are based on initial modelling undertaken before the proposed change was finalised

Table 2-5 Year 2 peak earthworks and Marine Works – magnitude of annual mean acid deposition rate changes at key ecological receptors

Ecological receptor	Quantified residual effects from DCO		Proposed change	
	Change as a percentage of CL	Total deposition as a percentage of CL	Change as a percentage of CL	Total deposition as a percentage of CL
Cae Gwyn SSSI	+1%	85%	+~2% (*)	~86% (*)
Tre'r Gof SSSI	+6% (*)	96% (*)	+~7% (*)	~97% (*)
Cestyll Gardens (short vegetation)[2]	+0.12 (*)	0.97 (*)	+~0.13 (*)	~0.98 (*)
Cestyll Gardens (tall vegetation)[2]	+0.24 (*)	1.56 (*)	+~0.26 (*)	~1.58 (*)

[1] CL = critical load (i.e. the environmental criteria for nitrogen or acid deposition)

[2] Cestyll Gardens – values shown are the acid deposition rates in keq/ha/year as no critical load available

Values shown with asterisks in brackets denote results which are above the criteria for requiring further consideration in the terrestrial and freshwater ecology assessment (or require consideration as part of the cultural heritage assessment (Cestyll Gardens))

Note: "~" is used to denote that the results are based on initial modelling undertaken before the proposed change was finalised.

Table 2-6 Year 5 peak Power Station construction – magnitude of annual mean nitrogen deposition rate changes at key ecological receptors

Ecological receptor	Quantified residual effects from DCO		Proposed change	
	Change as a percentage of CL	Total deposition as a percentage of CL	Change as a percentage of CL	Total deposition as a percentage of CL
Cae Gwyn SSSI	+1%	101%	+~2% (*)	~101% (*)
Tre'r Gof SSSI	+5% (*)	135% (*)	+~6% (*)	~136% (*)
Cestyll Gardens (short vegetation)[2]	+0.3 (*)	10.2 (*)	+~0.5 (*)	~10.5 (*)
Cestyll Gardens (tall vegetation) [2]	+0.5 (*)	16.5 (*)	+~1.0 (*)	~17.0 (*)

[1] CL = critical load (i.e. the environmental criteria for nitrogen or acid deposition)

[2] Cestyll Gardens – values shown are the nitrogen deposition rates in kgN/ha/year as no critical load available

Values shown with asterisks in brackets denote results which are above the criteria for requiring further consideration in the terrestrial and freshwater ecology assessment (or require consideration as part of the cultural heritage assessment (Cestyll Gardens))

Note: "~" is used to denote that the results are based on initial modelling undertaken before the proposed change was finalised.

Table 2-7 Year 5 peak Power Station construction – magnitude of annual mean acid deposition rate changes at key ecological receptors

Ecological receptor	Quantified residual effects from DCO		Proposed change	
	Change as a percentage of CL	Total deposition as a percentage of CL	Change as a percentage of CL	Total deposition as a percentage of CL
Cae Gwyn SSSI	+1%	85%	+~3% (*)	~87% (*)
Tre'r Gof SSSI	+5% (*)	94% (*)	+~8% (*)	~97% (*)
Cestyll Gardens (short vegetation)[2]	+0.05 (*)	+0.90 (*)	+~0.12 (*)	~0.97 (*)
Cestyll Gardens (tall vegetation) [2]	+0.10 (*)	+1.42 (*)	+~0.25 (*)	~1.57 (*)

[1] CL = critical load (i.e. the environmental criteria for nitrogen or acid deposition)

Cestyll Gardens – values shown are the acid deposition rates in keq/ha/year as no critical load available

Values shown with asterisks in brackets denote results which are above the criteria for requiring further consideration in the terrestrial and freshwater ecology assessment (or require consideration as part of the cultural heritage assessment (Cestyll Gardens))

Note: "~" is used to denote that the results are based on initial modelling undertaken before the proposed change was finalised

Conclusions

2.5.27 Based on the analysis using the initial modelling results, it is concluded that the proposed change would not lead to any noticeable changes to the description of effects for PM_{10}, $PM_{2.5}$, SO_2 and CO. The significance of the effect for these pollutants remains as not significant.

2.5.28 More detailed analysis of the predicted NO_2 concentrations at human receptors and the effect of the proposed change showed that in year 2, the majority of air quality effects for NO_2 would be considered negligible and the maximum concentrations would be well within the relevant AQOs. These represent relatively small increases in concentrations and related effect descriptors to the quantified residual effects. For year 5, the results show a slight worsening of the effects as a result of the proposed change. However, this still represents an improvement on the results for year 5 set out in the DCO application where it was concluded that effects were not significant.

2.5.29 On this basis, the effect of the proposed change is concluded to be not significant with regard to NO_2 concentrations at human receptors.

2.5.30 Quantification of the additional mitigation secured in the DCO application removed all ecological receptors from requiring consideration in the terrestrial and freshwater ecology or cultural heritage assessments with regard to NOx concentrations. The proposed change does not alter this outcome and therefore a non-significant effect can be concluded with regard to NOx concentrations at all ecological receptors.

2.5.31 The significance of the changes to nitrogen and acid deposition at Cae Gwyn SSSI and Tre'r Gof SSSI as a result of the proposed change is considered in the terrestrial and freshwater ecology assessment below (paragraphs 2.5.51 to 2.5.69).

2.5.32 With regards to Cestyll Gardens, although some increases are observed due to the proposed changes, these have been shown to be small. Considering the additional mitigation which is secured in the DCO application, the contribution of air quality effects to the major adverse effect to Cestyll Gardens identified in chapter D11 (APP-130) of the Environmental Statement would be reduced. However, the conclusion of a major adverse effect to Cestyll Gardens would remain as reported in chapter D11 (APP-130) of the Environmental Statement owing to the removal of part of the garden forming part of its Essential Setting and noise and visual intrusion into the valley garden and the Essential Setting of the garden which are not affected by this proposed change.

Noise and vibration

2.5.33 The assessment of noise and vibration disturbance arising from construction activities for the Project is presented in chapter D6 (APP-125) of the Environmental Statement. The DCO application assessment is based on the working hours presented in Table 2-1 and the overall conclusions presented in the DCO application is that there would be significant effects on residential and non-residential receptors from construction noise.

2.5.34 The proposed change to working hours does not alter the vibration assessment, which is related to the separation distance between construction activities and receptors, and the type of construction equipment to be used and is therefore not considered further.

2.5.35 New construction noise modelling and assessment were undertaken to reflect the proposed change to working hours and consequential amendments to haul routes. The basis of this assessment incorporated an amended indicative plant list/schedule to reduce noise effects associated with the proposed change as much as possible. This included the following:

- a reduction in plant numbers associated with soft ground grading;
- a reduction in the duration of the soft ground grading activities within construction zones 6, 7, 8 and 9, which reduces overlap with the start of the Unit 1 and Unit 2 deep excavation in hard rock;
- a reduction in bulk earthworks plant associated with the month 19-21; and
- bringing forward the tunnelling and outfall works in the programme to start in month 1 rather than month 10.

2.5.36 The two new circular haul routes (HR-B1 and HR-B2) for dumper trucks have been introduced for the soft ground grading within construction zone 9. These will be used to collect and transport much of the bulk material required to construct Mound B early in the programme. Associated plant to load the dumper trucks has also been included in this area. Mound B runs beside the A5025 and provides noise attenuation for residential receptors in Tregele. This increases earthworks activity near Tregele during the first year of the plant schedule, but the resulting Mound B will reduce noise levels in Tregele for the remainder of the construction period.

2.5.37 Before and after extracts showing changes to the new haul routes are shown in Figure 2-1 and Figure 2-2.

2.5.38 A number of amendments to the indicative plant list/schedule have been made on the basis of the noise modelling to better reflect the early construction programme. Therefore, additional noise models have been prepared for months 7-9 and 10-12 of the construction programme. The results from these models have been added to the DCO application assessments, and therefore the results of this noise assessment are based on six points in time rather than the four in the DCO application. The assessment is based on the highest daytime, evening and night-time noise levels calculated at each receptor from any of these six points in time; these may occur in different models.

2.5.39 Table 2-8 summarises the number of significant noise effects, before additional mitigation in the DCO application is applied, at residential receptors presented in chapter D6 (APP-125) of the Environmental Statement. Table 2-8 also details the number of significant effects, before mitigation, at residential receptors as a result of the proposed change and the difference between the modelling results for the proposed change and the assessment presented in the DCO application.

2.5.40 The noise modelling results, in the absence of additional mitigation for the proposed change, are summarised in the list below.

- There will be a net increase of four residential receptors at which a large magnitude of change (major adverse effects) is predicted. There is therefore no change to the significance of effects at these receptors as a result of the change in predicted noise levels.
- A net reduction of 79 residential receptors would experience beneficial effects with a change from medium magnitude of change (major adverse significance) to small magnitude of change (moderate adverse significance).
- There will be a net increase of 28 residential receptors which move from negligible magnitude of change (minor significance) to small magnitude of change (moderate significance). These residential receptors are newly significantly affected.

2.5.41 In total, there would be 1198 residential receptors at which moderate or major adverse significant effects may occur compared to 1170 in the DCO application in the absence of additional mitigation, which is a 2.4% increase as a result of the proposed change. However, there would be a 25% reduction in the number of major adverse significant effects compared to the DCO application which is considered to be substantial improvement on the situation presented in the DCO application.

2.5.42 With regard to non-residential receptors, modelling of the proposed change shows the following changes in significant construction noise effects:

- one hotel would experience a beneficial change from a major adverse effect to a moderate adverse effect; and
- there would be two additional commercial buildings at which a moderate adverse effect rather than a negligible adverse effect is predicted.

2.5.43 There would be no change in effects at any schools, places of worship, community buildings or offices when compared to the DCO application.

Table 2-8 Number of significant noise effects, in the absence of additional mitigation, at residential receptors as presented in the chapter D6 (APP-125) of the Environmental Statement and as a result of the proposed change

Magnitude of Change	Significance of Effect	DCO application Count	Proposed change Count	Change
Large	Major significance	11	15	4
Medium	Major significance	310	227	-83
Small	Moderate significance	849	956	107
Negligible	Minor significance	51	23	-28

2.5.44 The residential receptors at which predicted noise effects may increase from minor to moderate significance of effect are typically distant from the site, with

the majority being in Llanfachell which is approximately 1,800m from the WNDA. Considering the duration, the predicted moderate adverse effects at these properties will occur early in the construction programme; for example, during months 7-9, months 10-12 and months 19-21. After month 31, only minor adverse effects are predicted which is not considered significant. Therefore, moderate significance of effects are predicted to occur over relatively short periods and only during certain activities.

2.5.45 The noise levels predicted by the modelling activity provide a worst-case, calculated in accordance with BS 5228 (see APP-086). Noise results at these residential receptors exceed the moderate significance of effect threshold on average by 2 dB. However, the modelling method does not take several attenuation mechanisms into account. For example, atmospheric absorption, which particularly attenuates the higher frequency components of noise at larger distances, is disregarded. This means that the method is inherently conservative and often results in higher noise predictions at receptors than more sophisticated prediction methods. A more sophisticated noise propagation method is put forward in ISO 9613 which includes atmospheric absorption. Equivalent calculations at 1,800m using the ISO 9613 methodology are in the order of 3 to 4 dB lower at receptors for downwind (greatest) propagation.

2.5.46 Therefore, although the assessment methodology determines an increase to moderate significance of effect at a small number of residential receptors, this is largely the result of a conservative approach to the predictions and assessment. Nevertheless, on balance, the net reduction in noise effects at 79 residential receptors which had a major adverse effect in the DCO application, and which are now predicted to be subject to moderate adverse effects, is considered to outweigh the small increase in noise effects at 28 residential receptors with a change from minor adverse to moderate adverse. Therefore, it is concluded that the proposed change will lead to an improvement compared to the DCO application for a large number of residents.

Noise mitigation measures

2.5.47 The implementation and eligibility criteria of a Local Noise Mitigation Scheme (LNMS) for the Wylfa Newydd Project, which is secured in the Wylfa Newydd Code of Construction Practice (APP-414), will provide further reduced effects from the proposed change than those shown in Table 2-8. Of the 321 major significant effects identified in the DCO application, 91 would be eligible for the LNMS under the eligibility criteria in the DCO application, leaving 230 major significant effects.

2.5.48 As a result of the proposed change, ongoing Statement of Common Ground discussions and the major residual effects identified in the DCO application, Horizon will extend the commitments made in the LNMS to mitigate all major significant effects. This would involve increasing the distance from the Wylfa Newydd Development Area within which residential receptors would automatically be eligible for noise insulation (principally acoustic ventilation and either double or secondary glazing depending on the property) and reducing the construction noise eligibility criteria for residential receptors

outside this boundary to levels which are consistent with the onset of medium magnitude of change (major significant effect). In qualifying situations, residents will also be offered replacement garden fencing of a grade which serves as an effective noise barrier, to minimise noise levels in gardens. This will result in all 242 major significant effects, identified in Table 2-8 from the proposed change, being addressed through off-site mitigation. In addition to the benefits of a lower noise criteria reducing all major significant effects, a further 30 residential receptors assessed as moderately effected by the Project will be eligible for the LNMS due to the proximity to the Wylfa Newydd Development Area.

2.5.49 As part of the proposed change, the enhanced mitigation described in paragraph 2.5.48 above would be secured in an update to the Wylfa Newydd CoCP (APP-414) which would be subsequently submitted into Examination.

2.5.50 Chapter D6 (APP-125) of the Environment Statement identified significant effects as a result of construction noise on residential and non-residential receptors. As a result of the proposed change, significant effects still remain and the conclusions reached in chapter D6 (APP-125) remain the same. However, within this proposed change Horizon has been able to reduce the effects for the worst affected receptors. In addition, with the extension of the eligibility of the LNMS, Horizon will offer mitigation for all major significant effects. On balance therefore, it is concluded that there would be no new or different likely significant environmental effects other than those reported in the Environmental Statement with greater number of residential receptors benefiting from being eligible for noise insulation.

Terrestrial and freshwater ecology

2.5.51 The proposed change to working hours and the consequential change to haul routes have the potential to affect the assessment of effects on terrestrial and freshwater ecology, as detailed in chapter D9 (APP-128) of the Environmental Statement, as a result of changes in air quality, noise disturbance and visual disturbance through lighting.

Air quality related effects

2.5.52 With the application of the additional mitigation associated with air quality related effects described in paragraphs 2.5.2 to 2.5.7 above (e.g. quantification of lower emitting plant, machinery and marine vessels within the air quality dispersion modelling to produce quantified residual effects applicable to the DCO), there would no longer be any exceedances in the annual mean and 24-hour mean NOx critical levels at the sensitive ecological receptors included in the terrestrial and freshwater ecology assessment presented in chapter D9 (APP-128) of the Environmental Statement and all sites would be screened out from further consideration.

2.5.53 In terms of nitrogen and acid deposition two sensitive ecological receptors would remain as requiring further consideration: Cae Gwyn SSSI and Tre'r Gof SSSI.

2.5.54 Based on the information presented in the air quality assessment for ecological receptors (see paragraph 2.5.17 to 2.5.26), the proposed change

would not alter the conclusions presented within chapter D9 (APP-128) of the Environmental Statement regarding the potential effects on both Tre'r Gof SSSI and Cae Gwyn SSSI. Small measurable changes in the attributes and quality of the two SSSIs are predicted through the decrease in overall species richness, the decrease in forb species coverage, and the increase in coarse graminoid species cover which would result from the changes in air quality. These would be addressed through the additional mitigation measures presented in chapter D9 (APP-128) (e.g. implementation of continuous NO_2 monitoring to track compliance against the AQOs – see the Air Quality Management Strategy contained within the Wylfa Newydd CoCP (APP-414) and the Main Power Station Site sub-CoCP (APP-415) the further information about further measures) which informs the conclusion of minor adverse effects as a result of air quality changes at both Tre'r Gof SSSI and Cae Gwyn SSSI.

Noise related effects

2.5.55 Those ecological receptors with the potential to be affected by increased noise disturbance during construction were identified within chapter D9 (APP-1289) of the Environmental Statement as:

- Reptiles;
- Chough (*Pyrrhocorax pyrrhocorax*);
- Breeding birds;
- Over-wintering birds;
- Bats;
- Otter (*Lutra lutra*);
- Water vole (*Arvicola amphibious*);
- Red squirrel (*Sciurus vulgaris*);
- Notable mammals; and
- Freshwater fish.

Reptiles, notable mammals, breeding birds and over-wintering birds

2.5.56 During site preparation and clearance works, reptiles and notable mammals would be moved from site into adjacent retained habitat or bespoke receptor sites which link into the wider landscape. The removal of terrestrial habitat would also result in breeding and over-wintering birds no longer being able to use the Main Site for nesting or shelter, and foraging opportunities would be altered. As a result of this habitat loss, these bird species are predicted to use habitats adjacent to the Main Site. Adjacent habitats would be affected by noise disturbance which would occur for longer periods as a result of the proposed change. Species using these habitats would habituate to the level of noise disturbance and distribute accordingly within the suitable habitat available. The availability of suitable habitat is not considered to be a constraint on these species.

2.5.57 The proposed change is therefore not considered likely to result in a change in the assessment for reptiles, notable mammals, breeding birds or over-

wintering birds as it is presented within chapter D9 (APP-128) of the Environmental Statement.

2.5.58 Although not identified as a distinct receptor within chapter D9 (APP-128) of the Environmental Statement, barn owls were considered in relation to disturbance at known roost sites within the Wylfa Newydd Development Area. Roosts at Cafnan Farm, Caerdegog Isaf Farm, and Mynydd Ithel Farm were modelled as part of the noise assessment presented in chapter D6 (APP-125) of the Environmental Statement, with peak noise levels predicted as 79dB $L_{Aeq,1\text{-}hour}$[3] (Cafnan Farm); 65dB $L_{Aeq,1\text{-}hour}$ (Caerdegog Isaf Farm); and 63dB $L_{Aeq,1\text{-}hour}$ (Mynydd Ithel Farm).

2.5.59 Noise modelling undertaken to inform the proposed change predicted these peak noise levels will either remain as presented in the DCO Environmental Statement, or slightly reduce following the mitigation measures presented in the noise and vibration section above: 69dB $L_{Aeq,1\text{-}hour}$ (Cafnan Farm); 65dB $L_{Aeq,1\text{-}hour}$ (Caerdegog Isaf Farm); and 59dB $L_{Aeq,1\text{-}hour}$ (Mynydd Ithel Farm).

2.5.60 This supports the conclusion that the proposed change is therefore not considered likely to result in a change in the assessment for breeding birds as it is presented within chapter D9 (APP-128) of the Environmental Statement.

Chough

2.5.61 Table 2-9 below details the changes to peak predicted noise levels at chough nest sites as a result of the proposed change. Peak noise levels affecting chough at historic nest locations within the Existing Power Station (nest locations A and B), and on Wylfa Head (nest locations C and D), are not considered to change significantly compared to those reported in the DCO Environmental Statement as a result of the proposed change.

Table 2-9 Changes in predicted peak noise levels at chough nest sites

Nest location	DCO Environmental Statement peak predicted noise level	Proposed changes peak predicted noise level
A	65dB LAeq,1-hour	72dB LAeq,1-hour
B	85dB LAeq,1-hour	77dB LAeq,1-hour
C	61dB LAeq,1-hour	60dB LAeq,1-hour
D	61dB LAeq,1-hour	64dB LAeq,1-hour

2.5.62 Peak noise levels within core chough foraging areas are also not predicted to exceed the 85dB $L_{Aeq,1\text{-}hour}$ assessed within chapter D9 (APP-128) of the Environmental Statement.

2.5.63 The timing and duration of noise disturbance to chough are as important in determining the potential effect of the disturbance. Chough are considered to be generally resilient to disturbance as long as the disturbing factors are regular and present prior to breeding attempts or occur later in the breeding

[3] The sound level of a steady sound having the same energy as a fluctuating sound over a 1-hour time period. It is possible to consider this level as the ambient noise encompassing all noise at a given time (in this case 1 hour). LAeq is considered the best general-purpose index for environmental noise.

season. However, new disturbance events during the very early stages of the breeding season can cause birds to desert the nest site for the season [RD5].

2.5.64 Good practice mitigation already committed to in the DCO application and enforced by the Environmental Clerk of Works on site, would seek to ensure construction noise would not start at the critical nest establishment stage and would be at levels that chough have habituated to.

2.5.65 Given the minor changes predicted to the peak noise levels detailed within the Environmental Statement, and the good practice mitigation already committed to in the DCO application, the proposed change is therefore not considered likely to lead to a change in the assessment for chough as it is presented in chapter D9 (APP-128) of the Environmental Statement.

Bats

2.5.66 The assessment of noise disturbance to bats detailed within chapter D9 (APP-128) of the Environmental Statement, considers the Main Construction periods as avoiding the more sensitive periods when bats would be emerging or re-entering roosts. With the proposed change noise levels are predicted to decrease. The maximum level at the Tyn-y-Maes bat barn described in chapter D9 (APP-128) of the Environmental Statement was 75dB $L_{Aeq,1\text{-hour}}$, with the predicted peak at this location following the proposed change being 71.4dB $L_{Aeq,1\text{-hour}}$. Lighting levels at retained bat roosts are also not predicted to increase (see Environmental Lighting Impact Assessment section below).

2.5.67 Good practice mitigation has already been committed to in the DCO application, in the form of providing a 10m hard buffer around retained bat roosts within which screening would be provided and no construction activity would occur. Additional mitigation, also already committed to in the DCO application, in the form of bat boxes erected in retained habitats to provide alternative roost locations would also offset the potential for abandonment of roosts due to disturbance.

2.5.68 Given peak noise disturbance levels are not predicted to increase significantly around retained roosts, and mitigation measures are proposed to offset adverse effects, it is considered that the proposed change would not result in any change to the assessment presented within chapter D9 (APP-128) of the Environmental Statement.

Otter, water vole, red squirrel and freshwater fish

2.5.69 Otter, water vole, red squirrel and freshwater fish have been recorded within habitat to be retained on site during construction (e.g. Afon Cemlyn; Dame Sylvia Crowe's Mound). Although the proposed change would result in noise levels continuing for longer periods than detailed within the DCO Environmental Statement, the embedded, good practice and additional mitigation detailed within chapter D9 (APP-1289), to offset adverse effects on these species would remain relevant and functional regardless of timings. It is therefore considered that the proposed change would not alter the conclusions of assessment for these species as it is presented within chapter D9 (APP-128) of the Environmental Statement.

Lighting related effects

2.5.70 Regarding disturbance effects on sensitive ecological receptors as a result of changes in lighting design, the environmental lighting assessment below (paragraphs 2.5.80 to 2.5.83), identifies three ecological receptors where no change would occur and two ecological receptors where adverse effects from lighting disturbance may increase as a result of the proposed change (Table 2-10). However, with the provision of new and existing mitigation already secured in the DCO application (see Table 2-10), all predicted effects would be reduced to levels identified and assessed within the Environmental Statement, chapters D9 (APP-128) and appendix D10-10 (APP-201).

Summary

2.5.71 Given the positive effects the lower emitting plant, machinery and marine vessels would have to air quality, the neutral effect of environmental lighting and the very minor changes to peak noise levels predicted as a result of the proposed change, it is not considered that these effects would combine to result in any new or different likely significant effects to the assessment of the sensitive ecological receptors detailed above than those detailed within chapter D9 (APP-128) of the Environmental Statement.

Environmental Lighting Impact Assessment

2.5.72 The likely lighting effects on dark skies, nearby communities and ecological receptors, that would result from the construction of the Project are presented in appendix D10-10 (APP-201) of the Environmental Statement.

2.5.73 Even though the majority of construction activities associated with the earthworks would remain restricted to 07:00-19:00 hours, soft-grading activities will continue up to 23:00 meaning that haul routes out to Mounds B1 and E will be in use up to this time. Similarly, haul routes specifically associated with night time working in the deep excavations at the centre of the Main Power Station Site will be in use 24/7. Consequently, there is a requirement to light haul routes for security and maintenance purposes as a minimum and therefore modelling of the haul road lighting during the earthworks phase has been undertaken.

2.5.74 The basis of modelling and assessment assumes that the indicative lighting design for the haul routes complies to BS5489-2013 standard [RD6], lighting class P2, and with assumed lighting levels of 10lux average with a 3lux minimum, which is the lighting class for subsidiary roads with a typical speed of ≤30mph. Due to the size of the moving vehicles and with no pedestrian routes to safeguard pedestrians at the earthworks phase, the traffic flow has been assessed as ‘busy’. Maximum column mounting height would be 12m and lanterns have been designed to mount post top with 0 degrees of tilt to reduce light pollution.

2.5.75 Table 2-10 details the lighting effects on sensitive receptors as presented in appendix D10-10 (APP-201) of the Environmental Statement and the potential change to this assessment as a result of the proposed change.

2.5.76 Eight potential lighting receptors have been identified and assessed in relation to the changes to working hours. These include a combination of ecological receptors and community receptors. Five of these receptors were assessed as part of the proposals submitted with the DCO application and reported in appendix D10-10 (APP-201). However, in light of the proposed change to working hours, a further three sensitive receptors have been identified that could be potentially affected. These are residential receptors located on the western boundary of the Wylfa Newydd Development Area (receptors 11, 12 and 14). The locations of all eight potential receptors are shown in Figure 2-3.

2.5.77 Table 2-10 summarises the results of the assessment of the lighting effects associated with the proposed change on the receptors described in paragraph 2.5.76 and allows a comparison with the previously assessed effects where relevant.

2.5.78 Table 2-10 also details mitigation which was previously identified and has already been secured in the DCO application, such as back light shields and careful positioning of lighting columns as required where appropriate.

2.5.79 As detailed in paragraph 1.3.29 of appendix D10-10 (APP-201) of the Environmental Statement, the Environmental Lighting Impact Assessment does not assess significance in relation to ecological receptors. Instead, it provides an assessment of magnitude for changes in lighting levels to inform the assessment of effects on terrestrial and freshwater ecology (APP-128), marine ecology (APP-132) and the shadow Habitats Regulations Assessment (APP-050/051). Reference should be made to those assessments for the predicted significance of lighting effects on specific receptors.

Ecological lighting receptors

2.5.80 The proposed change has the potential for additional lighting effects to occur on the buffer zones along watercourses within the Wylfa Newydd Development Area (receptor 8) resulting in a change of effect from small adverse (as reported in the DCO application) to medium adverse. There may also be potential for lighting effects to occur at Mynydd Ithel Farm (receptor 14) result in a change from negligible (as reported in the DCO application) to small adverse although this would remain as not significant.

2.5.81 There is potential risk of light spill onto Caerdegog Farm (receptor 3) as a result of the proposed change. However, with mitigation secured in the DCO application (within the Wylfa Newydd CoCP (APP-414) any light spill into this area would be prevented (see Table 2-10). Therefore, there would be no change in the magnitude of effect from lighting on Caerdegog Farm compared to that presented in the DCO application and the conclusions of the terrestrial and freshwater ecology assessment presented in chapter D9 (APP-128) of the Environmental Statement with regard to this receptor would remain the same.

2.5.82 The indicative lighting design (see paragraph 2.5.74) for the haul routes suggests there would be no change to the assessment of lighting effects to Cemlyn Bay (receptor 4/5).

2.5.83 Embedded and additional mitigation (i.e. that which has already been secured in the DCO application) and enhanced mitigation (i.e. measures required to reduce effects as a result of this proposed change) identified for relevant receptors is set out in Table 2-10. As part of the proposed change, any enhanced mitigation proposed would be secured in an update to the Wylfa Newydd CoCP (APP-414) which would be subsequently submitted into Examination.

2.5.84 With the mitigation presented in Table 2-10, the magnitude of effects would not be any worse than that presented in the DCO application. Therefore, the conclusions of the terrestrial and freshwater ecology assessment presented in chapter D9 (APP-128) of the Environmental Statement and in the Shadow Habitats Regulations Assessment (APP-050/051) with regard to these ecological receptors would remain the same.

Community lighting receptors

2.5.85 Regarding the community receptors, the updated lighting modelling results which reflect the proposed change, showed that there would be no additional lighting effects to the nearby communities of Cemaes (receptor 2) or Tregele Village (receptor 7).

2.5.86 The updated lighting modelling showed no significant effect on residential receptor 12 and 13. An adverse effect from the proposed change was identified at receptor 11, but with mitigation in place which has already been secured in the DCO application, such as issue of blackout blinds to residents of this property, light disturbance at this receptor would be negligible.

Figure 2-3 Amended earthworks haul routes as a result of the proposed change with annotated key lighting sensitive receptors

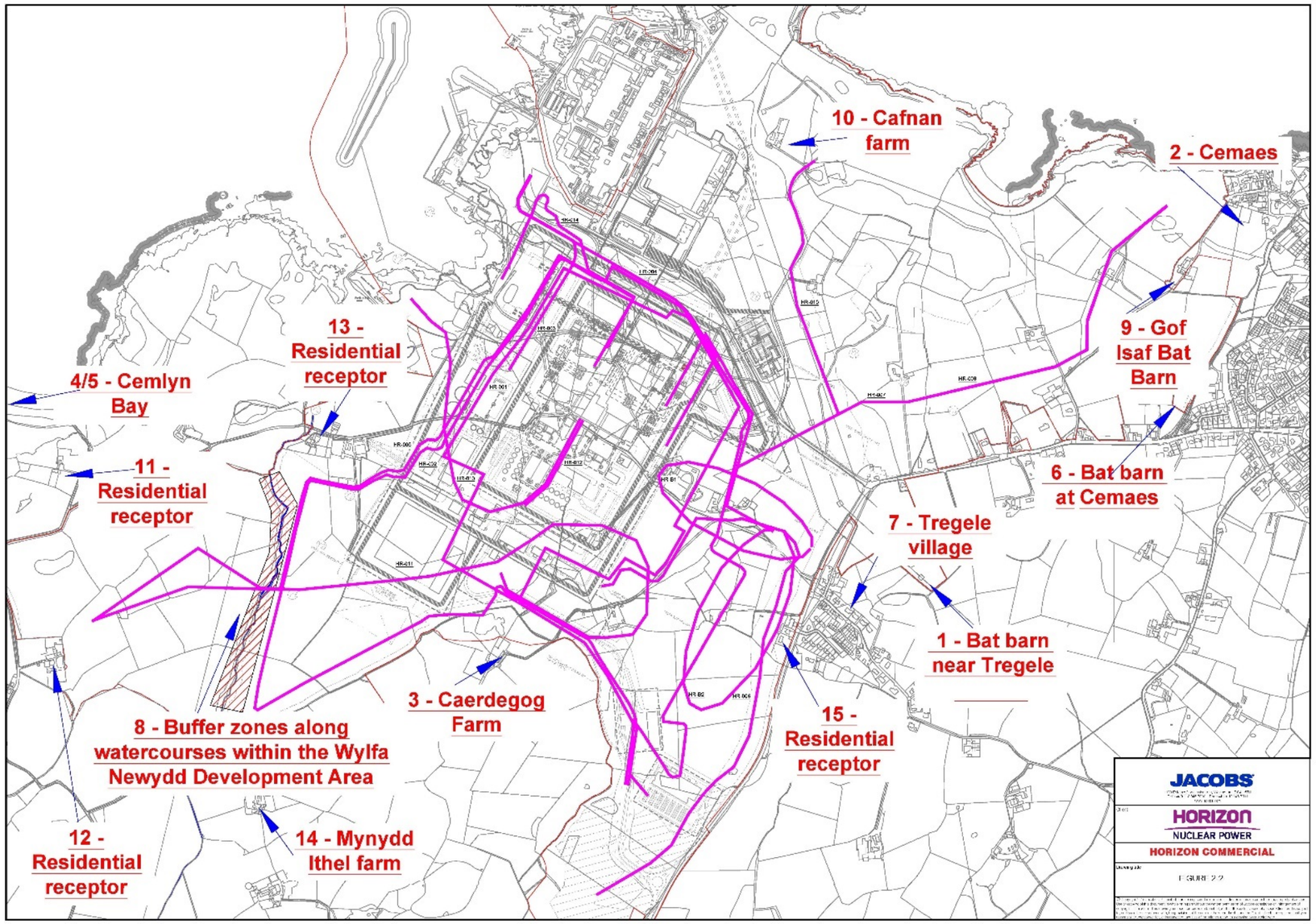


Table 2-10 Lighting effects on sensitive receptors as presented in appendix D10-10 (APP-201) of the Environmental Statement and as result of the proposed change. Additional mitigation has been proposed where appropriate and the residual effects assessed

View	Light sensitive receptor	Residual magnitude of effect in DCO application	Significance of residual effect in DCO application	Description of potential effect of the proposed change and existing mitigation secured in the DCO application	Potential change in assessment as a result of the proposed change (magnitude / significance of effect)	Enhanced mitigation as a result of the proposed change	Post-mitigation magnitude of effect	Significance of residual effect
Ecological receptors								
3	Caerdegog Farm	Negligible	Refer to chapter D9 (APP-128) for significance of lighting effects on ecology.	There is potential risk of light spill onto this location (3 on the amended haul routes receptor map). However, with mitigation in place which has already been secured in the DCO application (e.g. columns along the haul road to be facing away for this location; careful placement when designing column location and backlight shields) any light spill into this area would be prevented.	No change	N/A	N/A	N/A
4/5	Cemlyn Bay	Negligible	Refer to Shadow Habitats Regulations Assessment Report (APP-050/051) for effects in relation to the SPA. Refer to chapter D9 (APP-128) for significance of lighting effects on ecology	The haul routes indicative lighting design shows there would be no additional light spill onto this receptor (4/5 on the amended haul routes receptor map). Detailed design stage checks to review vertical grids to check and confirm that there is no light spill into this area (this mitigation is already secured in the Wylfa Newydd CoCP (APP414)).	No change	N/A	N/A	N/A
8	Buffer zones along watercourses within the Wylfa Newydd Development Area	Small adverse	Refer to chapter D9 (APP-128) for significance of lighting effects on ecology	Lighting from haul route HR-011 associated with Mound E would have potential to trespass into buffer zone on watercourse. However, with mitigation in place which has already been secured in the DCO application (e.g. careful placement of lighting columns along with back light shields) light spill during working hours would be significantly reduced.	Medium adverse / N/A (ecological receptor)	Lighting on the haul route, from columns within 40m either side of the watercourse, will be dimmed 50% using the Central Management System outside of construction working hours to reduce light trespass around the watercourse. In the event of a security alert or for safety considerations this lighting will be reset to 100% for the duration of the alert but will resume its regular dimming profile once the incident has been resolved (this mitigation would be secured in the Wylfa Newydd CoCP (APP414)).	Small adverse (as in DCO application)	As in DCO application
14	Mynydd Ithel Farm	Negligible	Refer to chapter D9 (APP-128) for significance of lighting effects on ecology	Close proximity of this site to the construction of mound E could create small adverse change; this would be dependent on the way the mound is constructed and the location of the unloading points where localised task lighting will be used. It is understood that these uploading points will move frequently as they build up the mound. Detailed design stage checks to review vertical grids to check and confirm that there is no light spill into this area (this mitigation is already secured in the Wylfa Newydd CoCP (APP414)).	Small adverse / N/A (ecological receptor)	N/A	Negligible	As in DCO application

View	Light sensitive receptor	Residual magnitude of effect in DCO application	Significance of residual effect in DCO application	Description of potential effect of the proposed change and existing mitigation secured in the DCO application	Potential change in assessment as a result of the proposed change (magnitude / significance of effect)	Enhanced mitigation as a result of the proposed change	Post-mitigation magnitude of effect	Significance of residual effect
New community receptors								
11	Residential receptor	N/A New receptor	N/A New receptor	This dwelling is located west of the proposed site and in the vicinity of the tern nesting area; also 665m west of the proposed haul road. There is potential for some task lighting and headlights associated with construction of Mound E to affect the dwelling, effects would be limited. However, with mitigation in place which has already been secured in the DCO application, such as issue of blackout blinds to residents of this property, light disturbance at this receptor would be reduced.	Negligible / Negligible	N/A	N/A	N/A
12	Residential receptor	N/A New receptor	N/A New receptor	This dwelling is located southwest of the proposed Horizon site and 200m south of the proposed haul road. There are not considered to be any potential effects.	Negligible / None	N/A	N/A	N/A
13	Residential receptor	N/A New receptor	N/A New receptor	This dwelling is located approximately 20m from the proposed Horizon site boundary and located central to three proposed haul routes; minimum distance to haul road is 203m. No potential effects recorded.	Negligible / None	N/A	N/A	N/A

The marine environment

2.5.87 The proposed change to working hours and plant associated with the Marine Works have the potential to affect the assessments made in chapter D13 (the marine environment) (APP-132) of the Environmental Statement, through changes in assessed levels of visual disturbance and lighting as well as airborne noise disturbance. The effect of the proposed change to marine environment receptors is assessed below.

Fish and marine mammals

2.5.88 The assessments of visual disturbance effects for the Marine Works which is presented within chapter D13 (APP-132) of the Environmental Statement was based on 24-hour working to account for the dredging operations. Light can act either as an attractant (for planktivorous feeders) or a deterrent (predatory feeders) for fish and therefore artificial light levels can affect the natural behaviour of species.

2.5.89 The presence of personnel and construction lighting from marine operations was considered to have the potential to result in temporary displacement of fish from the area and disturbance to feeding. The effect of visual disturbance on all fish receptors was assessed as negligible in chapter D13 (APP-132) of the Environmental Statement owing to the fact that there is available habitat along the north Anglesey coastline therefore displacement would only be localised and would not have an effect on populations. As indicated above, this assessment was already based on 24-hour operations for marine dredging therefore any changes to personnel, plant and lighting that may be required for the Marine Works as a consequence of the proposed change would not have an effect on the assessments made.

2.5.90 For marine mammals, visual disturbance was assessed in the context of grey seals that have either surfaced or are hauled-out. The effects could cause seals to cease feeding, resting and socialising and result in displacement from the area. The assessment within chapter D13 (APP-132) of the Environmental Statement took account of the fact that dredging operations would occur for 24 hours a day and concluded negligible effects on marine mammals owing to there being no primary or secondary breeding sites along the north Anglesey coastline and sightings in the Wylfa Newydd Development Area are sporadic individuals or small groups. As with fish receptors, the assessment already assumed visual disturbance for 24 hours a day, therefore any changes in personnel, plant and lighting that may be required for the Marine Works as a consequence of the proposed change will not have an effect on the assessments made.

Seabirds

2.5.91 The assessments of visual disturbance on seabirds was made within chapter D13 (APP-132) of the Environmental Statement and accounted for:

- construction activities for the breakwater, MOLF, temporary cofferdam and subsequent Cooling Water System intake and outfall works;

- increased barge/vessels in construction areas;
- lighting for offshore ground works;
- ground works and construction activities; and
- increased presence of human activity.

2.5.92 Assessments of visual disturbance made in chapter D13 (APP-132) of the Environmental Statement and the Shadow Habitats Regulations Assessment (APP-050/051) were based on earthworks being completed between the hours of 07:00 and 19:00 and included additional mitigation that was developed to protect the tern colony in Cemlyn Lagoon which forms the Anglesey Terns/Morwenoliaid Ynys Mon SPA. The mitigation defined in the Wylfa Newydd CoCP (APP-414) stipulates restrictions on any construction works within 500m of the nesting islands and shingle ridge between the 15 April and 15 May to protect pre-laying and nest establishment in the tern colony. It also goes on to stipulate that no bulk earthworks will be undertaken within 500m of any known active tern nests within the Anglesey Terns/Morwenoliaid Ynys Mon SPA. This mitigation would remain applicable to the proposed change.

2.5.93 Terns and breeding black-headed gulls may be sensitive to the use of lighting at night. The assessments made in chapter D13 (APP-132) of the Environmental Statement took account of the works for the proposed MOLF and breakwaters located over 1km from the breeding colony. The lighting from the Marine Works was considered to have no effect on terns and breeding black-headed gulls, as they do not normally fly or actively feed at night. In addition, the lighting levels were assessed to not extend outside of the bay and therefore would not affect nesting terns.

2.5.94 As outlined in Table 2-10, the haul routes indicative lighting design shows there would be no additional light spill onto Cemlyn Bay (receptor 4/5) as a result of the proposed change. Whilst this would need to be confirmed at the detailed design stage, the proposed change to haul routes and the associated lighting is not considered to affect the assessment of visual disturbance presented in chapter D13 (APP-132) of the Environmental Statement and the Shadow Habitats Regulations Assessment Report (APP-050/051).

2.5.95 The potential effects of the proposed change to the terns and breeding black-headed gulls is not considered likely to result in anything more than a negligible magnitude of change and therefore the significance of the effect would remain negligible, as reported in the DCO application. Furthermore, any changes to personnel, plant and lighting that may be required for the Marine Works as a consequence of the proposed change would have no effect on the conclusions made within the DCO application as the assessments already takes into consideration 24-hour dredging operations.

2.5.96 For lighting and visual disturbance from earthworks, the extent of visual change with potential to affect the terns (either at the colony or at sea) was assessed as not likely to generate levels of visual disturbance significantly above existing background levels (i.e. in terms of potential disturbance to terns, they would be consistent with disturbance generated by other industrial, agricultural and recreational activities that are routinely undertaken in the local

landscape, and would be unlikely to be greater than visual disturbance generated by e.g. visitors and walkers utilising public rights of way and accessing the shingle ridge). The mitigation outlined in the DCO application and presented above protects nesting terns from disturbance and therefore any changes to personnel, plant and lighting that may be required for land based operations as a consequence of the proposed change would not change the assessment made within chapter D13 (APP-132) of negligible effect or the Shadow Habitats Regulations Assessment (APP-050/051) of no likely significant effect.

Summary

2.5.97 In summary the assessments made within chapter D13 (APP-132) of the Environmental Statement and the Shadow Habitats Regulations Assessment (APP-050/051) accounted for 24-hour works in marine construction and relied on mitigation around working windows for the breeding tern colony in Cemlyn Lagoon. Consequently, the proposed change to working hours would have no effect on the conclusions made within the DCO application.

Combined topic effects

2.5.98 As shown in above, the proposed change to working hours and the consequential changes to haul routes have implications to the air quality, noise, terrestrial and freshwater ecology, and landscape and visual (i.e. lighting effects) topic assessments. Although each of the topic assessments concluded overall no new or different likely significant environmental effects as a consequence of the proposed change, there is potential for small changes in effects (either from the same topic or different topics) to alter the assessment of combined topic effects reported in chapter D16 (APP-135) of the Environmental Statement.

2.5.99 The proposed change does not affect marine environment receptors via more than one topic and therefore the marine environment assessment is not considered further (the combined effect of the proposed change to airborne noise and visual disturbance has already been considered in the marine environment assessment).

2.5.100 Table 2-11 outlines the topics assessments and receptors potentially affected by the proposed change. It should be noted that the various topics have grouped receptors at different scales as is appropriate for the particular assessments, and individuals that identify within some of these subgroups may overlap.

2.5.101 The implications of the proposed change have been considered for human receptors and other receptors under the subsequent headings.

Human receptors

Residential receptors

2.5.102 Within chapter D16 (APP-135) of the Environmental Statement it was identified that residential receptors in Cemaes, Cemlyn Bay, and Tregele

would likely be subject to combined effects due to adverse effects resulting from an increase in noise and vibration, as well as changes to visual amenity and perceived changes in dust deposition. Effects would be most pronounced for the properties situated closest to the Wylfa Newydd Development Area.

2.5.103 With quantification of the additional mitigation currently secured in the DCO application, the "community in Cemaes" receptor group would no longer be considered within the combined topic assessment with respect to air quality, as there are no receptors with medium or large adverse effect descriptors. The proposed change would also result in a substantial reduction in the number of properties in Cemaes subject to noise effects of major significance (see Table 2-8), with no change to the assessment of visual amenity via lighting associated with the new haul routes and greater night-time working. Consequently, the proposed change is not considered to result in a greater combined effect for residential properties in Cemaes with potential for a reduction to occur from that reported in the DCO application as a result of the decreased noise and air quality effects.

2.5.104 The proposed change would result in worsening noise effects at a small number of properties in Tregele compared to that reported in the DCO application, increasing from negligible to minor adverse. The "community in Tregele" receptor group would also remain as requiring consideration in the combined topic assessment for air quality, owing to the medium adverse effect experienced at one property. It is likely that noise effects at this property (and possibly others) would combine with the major adverse effects on visual amenity which in itself would remain unaffected by the proposed change as no additional lighting effects are predicted in Tregele. However, considering the enhanced mitigation proposed with respect to the proposed change and the major adverse noise effects identified in the DCO application, there is considered to be no change to the combined effect reported in the DCO application although this would remain significant.

2.5.105 Other residential receptors surrounding the Wylfa Newydd Development Area (i.e. those within 350m and outlying areas including Cemlyn Bay), may be subject to small increases in both noise and air quality effects however, these are not considered to result in a greater combined effect than assessed in chapter D16 (APP-135) of the Environmental Statement.

Non-residential receptors

2.5.106 The proposed change does not alter the combined topic assessment for non-residential receptors reported in chapter D16 (APP-135) of the Environmental Statement.

Other receptors

2.5.107 For Tre'r Gof SSSI and Cae Gwyn SSSI, the principal effects during construction of the Project relate to changes in surface water and groundwater conditions. Although small increases in nitrogen and dust deposition would occur as a consequence of the proposed change, effects would remain as minor adverse and these are not considered to combine to result in a greater

effect during construction, or with any effects from the operation or decommissioning works.

Summary

2.5.108 Overall the proposed change would not result in any new receptors being scoped into the combined topic assessment for the WNDA Development nor would it alter the assessment of combined topic effects and conclusions reported in chapter D16 (APP-135) of the Environmental Statement.

Table 2-11 Topic assessments and receptors potentially affected by the proposed change to working hours (denoted by 'Y'), as well as any other topics which affect the same (or similar) receptors but are not affected by the proposed change (denoted by 'X') (adapted from appendix D16-1 (APP-236)).

Receptor (or group of receptors)	Socio-economics	Public access and recreation	Air quality	Noise and vibration	Soils and geology	Surface water and groundwater	Terrestrial and freshwater ecology	Landscape and visual	Cultural heritage	Coastal processes and coastal geomorphology	Marine environment	Radiological effects	Shipping and navigation
Human receptors													
Community in Cemaes	X		Y	Y		X		Y					
Community in Tregele	X	Covered by rows below	Y	Y		X		Y					
Outlying residential properties east of the Wylfa Newydd Development Area				Y									
Residential properties on the A5025 between Cemaes and Tregele				Y									
Outlying residential properties west of the Wylfa Newydd Development Area				Y		X							
Outlying residential properties south of the Wylfa Newydd Development Area				Y									
Outlying residential property south of the Wylfa Newydd				Y									

Receptor (or group of receptors)	Socio-economics	Public access and recreation	Air quality	Noise and vibration	Soils and geology	Surface water and groundwater	Terrestrial and freshwater ecology	Landscape and visual	Cultural heritage	Coastal processes and coastal geomorphology	Marine environment	Radiological effects	Shipping and navigation
Development Area (linked to development)													
Residential receptors within 350m of the Wylfa Newydd Development Area			Y										
Non-residential receptors within 350m of the Wylfa Newydd Development Area			Y										
Ecological receptors													
Tre'r Gof Site of Special Scientific Interest (SSSI)			Y			X	Y						
Cae Gwyn SSSI			Y			X	Y						

Health impacts

2.5.109 The proposed change is relevant to the following topics discussed in the Health Impact Assessment Report (APP-429):

- air quality (Section D.2: Air quality, vehicle and machinery emissions on the Wylfa Newydd Development Area during construction);
- noise (Section D.3 Noise, vehicle and machinery noise on the Wylfa Newydd Development Area during construction); and
- lighting (Section D.4 Community identity, social networks and culture, night-time lighting effects during construction).

2.5.110 Changes to local context and identity during construction and therefore issues relating to physical activity (the other topics discussed within volume D of the Health Impact Assessment Report, APP-429) are not expected to be affected by the proposed change. This is because the proposed change generally relates to the night-time period (when physical activity opportunity would be less likely to be affected).

2.5.111 The assessment of health effects arising from the proposed change only considers issues associated with construction activities, plant and on-site vehicles on the Wylfa Newydd Development Area. The relevant geographical population is predominantly the population near the Wylfa Newydd Development Area. As the Health Impact Assessment (HIA) reaches population health conclusions, discussion focuses on the community areas of (and between) Tregele and Cemaes. Isolated dwellings around the Wylfa Newydd Development Area are included within the analysis and conclusions but are not discussed explicitly. The conclusions also continue to take into account exposure to the workforce accommodated on the Site Campus.

2.5.112 The assessment of health impacts arising from the proposed change has given consideration to the following factors:

- longer working hours are expected to enable tasks to be completed more quickly or less intensively, and that generally, such changes would be expected to reduce the magnitude of effects experienced (offsetting such benefits would be that generally during the extended evenings and night-time times, more people would be present and more sensitive activities may be taking place with potential to disturb sleep or rest);
- not all evening and night-time activities would inherently cause disturbance or exposure on a level to have the potential to affect population health (the size of the Wylfa Newydd Development Area is such that separation distances from communities are likely to be adequate in many cases and larger noise sources (e.g. drilling rigs) would typically use acoustic shielding);
- effects from activities within deep excavations are likely to diminish with increasing depth (as communities would be increasingly shielded by the topography); and

- 24-hour construction activities were already a feature of the working hours presented in the DCO application.

2.5.113 The proposed change to working hours is presented alongside enhanced mitigation with respect to noise (see paragraph 2.5.48) and quantified mitigation with respect to air quality (see paragraph 2.5.2). The assessment and conclusions of this health analysis has taken into account these further substantial commitments.

Air quality related health effects

2.5.114 To assess potential air quality effects arising from the proposed change, further modelling was undertaken, the results of which are reported above from paragraph 2.5.2 onwards.

2.5.115 With consideration of the lower emitting plant, machinery and marine vessels outlined in paragraph 2.5.2 in relation to the emissions standards that the Project's plant and vehicles would comply with, nitrogen dioxide emissions produced from these sources would be considerably reduced. Although, the additional mitigation would not appreciably affect concentrations of PM_{10} and $PM_{2.5}$ from these sources, these were already assessed as negligible in chapter D5 (APP-124) of the Environmental Statement, being well within the relevant UK AQOs. The effect of the proposed change have been assessed against these quantified residual effects. The results of initial modelling indicate that the proposed change would not lead to any noticeable changes to the description of effects for PM_{10}, $PM_{2.5}$, SO_2 and CO.

2.5.116 In relation to vehicle and machinery emissions on the Wylfa Newydd Development Area during construction, the Health Impact Assessment Report (APP-429) reached an overall conclusion in relation to all air pollutants from this source, rather than separate conclusions for nitrogen dioxide and fine particulate matter. However, the assessment presented in chapter D5 (APP-124) of the Environmental Statement concluded that the effects from plant and machinery related primarily to nitrogen dioxide (particularly short-term concentrations), with negligible changes in annual mean or short-term concentrations of PM_{10} and $PM_{2.5}$.

2.5.117 Paragraphs D2.16 and D.2.17 of the Health Impact Assessment Report (APP-429) which concluded a minor adverse effect on the health of the general population and up to a moderate adverse effect on the health for particularly sensitive groups, therefore needs reconsidering in light of nitrogen dioxide concentrations (the pollutant driving the original conclusion) being substantially reduced by the additional mitigation secured in the DCO application.

2.5.118 On this basis it is considered that the conclusions reached in HIA paragraphs D2.16 that "*the residual significance of potential health and well-being effects is considered to be minor adverse for the general population (the majority of people) near the Wylfa Newydd Development Area*" would change to negligible as a consequence of the proposed change.

2.5.119 Similarly, the conclusions reached in HIA paragraphs D2.17 that "*For particularly sensitive groups within the affected population, the residual effect*

could range up to moderate adverse" would change to minor adverse as a consequence of the proposed change.

2.5.120 The HIA conclusions in relation to air pollutants, particularly fine particulate matter, from other sources (such as dust generated by construction activities, excavation and earth movements during construction) are not expected to be affected by the proposed change, or the vehicle emission standard mitigation commitments. It continues to be the case that dust mitigation secured within the DCO application (and supported by adaptive monitoring) is expected to reduce air pollutant emissions associated with the Project as low as reasonably practicable. As described in paragraphs D.2.40 and D.2.41 of the Health Impact Assessment Report (APP-429), the assessment's conclusion (for mobilised dust type effects) is that there would be a negligible residual effect on the health of the general population and up to a minor adverse residual effect on the health for particularly sensitive groups. This score reflects that health effects, including non-threshold type effects from fine particulates, cannot be ruled out, but would be within UK AQOs.

2.5.121 In summary, changes to less adverse HIA conclusions for vehicle and machinery emissions on the Wylfa Newydd Development Area during construction reflect the beneficial effects of the additional mitigation secured in the DCO application. This conclusion remains with consideration of the proposed change.

Noise related health effects

2.5.122 The extension of construction activities to evening and night-time at the Wylfa Newydd Development Area as part of the proposed change, is likely to increase the potential for sleep disturbance. The changes encompass a wide range of activities and areas on the Wylfa Newydd Development Area. Activities near the settlements of Tregele and Cemaes are likely to be most influential for population health. As described in the DCO application, a key activity in this area is the establishment of earth bunds. As they are built, the bunds would be associated with adverse noise effects but would then provide noise mitigation benefits thereafter. This would continue to be the case with the proposed change.

2.5.123 For the proposed change with respect to noise, the health analysis considers two time periods. The first relates to the evening period (19:00 to 23:00) and the second relates to the night-time period (23:00 to 07:00).

2.5.124 For the evening period, the proposed change includes those that extend working to include 19:00 to 23:00 (site grading), as well as those that extend working to include 19:00 to 07:00 (the 19:00 to 23:00 part within this relating to the evening period) (see Table 2-2). The extension of activities from 19:00 to 23:00 may therefore cause some disturbance when most people may be starting to sleep. However, activities during this time would not extend into the night-time period of 23:00 to 07:00 that is often used by health-related noise criteria such as the World Health Organisation's Night noise guidelines for Europe [RD7]. The changes within the evening period are therefore unlikely to be associated with population level changes in sleep disturbance related health outcomes.

2.5.125 For the night-time period, the proposed change would result in 24-hour working at the Wylfa Newydd Development Area for a number of activities (see Table 2-2). Such a change to the levels of noise during the period of 23:00 to 07:00 would be expected to contribute to more adverse sleep disturbance related health outcomes, compared to the 19:00 to 23:00 period.

2.5.126 The general points set out in paragraph 2.5.112 of this health analysis are particularly relevant to the context of the night-time noise changes. In summary these expectations are: the longer working hours allowing tasks to be completed more quickly or less intensively; adequate separation distance for many activities; larger noise sources typically use acoustic shielding; topographic benefits to activities within deep excavations; and that 24-hour working was already a feature of the DCO application.

2.5.127 To assess potential noise effects arising from the proposed change, further modelling was undertaken, the results of which are reported above from paragraph 2.5.33 onwards. The results, pre-mitigation, indicate a reduction in the overall number of major significant effects as a result of the proposed change and when compared to the DCO application.

2.5.128 In population health terms the change in size of the affected population and the change in the magnitude of effects constitute similar parameters to those that informed the Health Impact Assessment Report (APP-429) submitted as part of the DCO application.

2.5.129 As a result of the proposed change, ongoing Statement of Common Ground discussions and the major residual effects identified in the DCO application, Horizon will extend the commitments made in the LNMS to mitigate all major significant effects. This means that all residential receptors expected to experience an effect of major significance (i.e. a medium or large magnitude of change) would be eligible for off-site mitigation through the LNMS (e.g. acoustic ventilation and either double or secondary glazing depending on the property).

2.5.130 The health analysis also assumes that the acoustic specification for the worker accommodation at the Site Campus (as well as working practices near this sensitive location, including other parts of the Site Campus operating or being developed) would be reviewed to ensure an appropriate sleep environment was maintained for both day-shift and night-shift workers. This embedded mitigation is already secured in the DCO application within the Design and Access Statement (volume 3, APP-409).

2.5.131 On this basis, it is considered that the conclusions reached in the HIA in relation to potential noise disturbance effects to population health from activities on the Wylfa Newydd Development Area during construction would remain as reported into the DCO application and that overall no new or different likely significant effects are predicted following the adoption of enhanced mitigation. As described in paragraphs D.3.19 and D.3.20 of the Health Impact Assessment Report (APP-429), this would be a minor adverse residual effect on the health of the general population and up to a moderate adverse residual effect on the health for particularly sensitive groups.

2.5.132 The health analysis continues to reflect a population health approach and the expected benefits of the LNMS and Section 61 applications under the Control of Pollution Act 1974.

Light related health effects

2.5.133 To assess potential lighting effects arising from the proposed change, further modelling was undertaken, the results of which are reported above from paragraph 2.5.72 onwards. The results indicate that there would be no additional lighting effects to the communities of Cemaes or Tregele.

2.5.134 On this basis, it is considered that the conclusions reached in the HIA in relation to night-time lighting from the Wylfa Newydd Development Area (which could potentially affect community identity or cause sleep disturbance) would be unchanged. As described in paragraphs D.4.36 and D.4.37 of the Health Impact Assessment Report (APP-429), this would be a negligible residual effect on the health of the general population and up to a minor adverse residual effect on the health for particularly sensitive groups.

Equality impacts

2.5.135 The potential effects of the Project on people with 'protected characteristics' (as set out in the Equality Act 2010) as well as socioeconomically deprived communities have been assessed in the Equality Impact Assessment (APP-434).

2.5.136 The updated air quality assessment (paragraphs 2.5.2 to 2.5.30) concluded that, considering the adoption of the lower emitting plant, machinery and marine vessels, the proposed change to working hours are not considered to significantly change the air quality assessment, and the conclusion of no significant effect presented in chapter D5 of the Environmental Statement (APP-124) remains as reported. On this basis it is considered that the conclusions reached in the Equality Impact Assessment (APP-434) in relation to potential air quality effects on equality from the Project's construction activities would remain unchanged. Therefore, no significant health and no disproportionate or differential equality effects are expected as a result of the proposed change.

2.5.137 The results of the noise assessment presented in paragraphs 2.5.33 to 2.5.50 show that the proposed change in the absence of additional mitigation to working hours would slightly increase the overall number of residential receptors at which significant effects are predicated. However, there would be a 25% decrease in the overall number of major significant effects from that reported in the DCO application in the absence of mitigation, which is a substantial reduction for a number of residential receptors worst effected by construction noise.

2.5.138 Taking into account the enhanced noise mitigation proposed (see paragraph 2.5.48), all residential receptors expected to experience an effect of major significance (i.e. a medium or large magnitude of change) would be eligible for off-site mitigation through the LNMS. It is therefore considered that the proposed change would not change the overall equality effects reported in the Equality Impact Assessment (APP-434) with regards to noise effects from

construction activities. Furthermore, no additional noise effects for educational facilities or places of worship were identified. Therefore, the conclusions of the Equality Impact Assessment (APP-434) with regards to noise effects from construction activities on these receptors remain unchanged.

Shadow Habitats Regulations Assessment

2.5.139 The assessments made within the Shadow Habitats Regulations Assessment (APP-050/051) accounted for 24-hour works in marine construction and relied on mitigation around working windows for the breeding tern colony in Cemlyn Lagoon. Therefore, changes to the working hours outlined in this request for non-material change will have no effect on the conclusions made. Further details can be found in the previous section (the marine environment).

2.5.140 The Shadow Habitats Regulations Assessment (APP-050/051), concluded no adverse effects on the vegetated shingle ridge that forms a qualifying feature of the Cemlyn Bay SAC as a result of changes in air quality. The conclusions of the air quality section of this document are that, with the lower emitting plant, machinery and marine vessels, levels of NOx and deposition of nitrogen and acid would decrease. On this basis, the conclusions of the Shadow Habitats Regulations Assessment (APP-050/051), with respect to air quality effects on Cemlyn Bay SAC therefore remain sound and unchanged.

Table 2-12 Likely new or different environmental effects

Document name	Examination Reference Number	Document/chapter/section name	Likely effect of the changes	Material change/non-material change/no change
Environmental Statement chapter D5	APP-124	Air quality	As outlined in paragraph 2.5.8 to 2.5.16, the proposed change would have a minimal effect on the effects at human receptors with regard to PM_{10}, $PM_{2.5}$, SO_2 and CO. On this basis, there is considered to be no material change to the air quality assessment for these pollutants, and the conclusions presented in chapter D5 (APP-124) of the Environmental Statement remain as reported. Whilst predicted concentrations of NO_2 at human and ecological receptors will change, the majority of effects would remain negligible and the maximum concentrations would be well within the relevant AQOs. Thus, there is considered to be no new or different likely significant environmental effects to the air quality assessment, and the conclusions of the air quality assessment presented in chapter D5 (APP-124) of the Environmental Statement remain as reported.	Non-material change
Environmental Statement chapter D6	APP-125	Noise and vibration	As outlined in paragraphs 2.5.33 to 2.5.50, a number of residential and non-residential receptors are significantly adversely effected by construction noise as identified in the DCO application and in relation to this proposed change. In the absence of additional mitigation there would a slight increase in the overall number of residential receptors at which significant effects are	Non-material change

Document name	Examination Reference Number	Document/chapter/section name	Likely effect of the changes	Material change/non-material change/no change
			predicated. However, there would be a 25% decrease in the overall number of major significant effects from that reported in the DCO application, which is a substantial reduction for a number of residential receptors worst effected by construction noise. Enhanced mitigation which increases the commitments made in the LNMS will be provided for all major significant effects resulting in 242 residential receptors being eligible. Furthermore, a number of residential receptors closet to the Wylfa Newydd Development Area will also benefit from the enhanced LNMS. It is therefore concluded that taking into consideration the balance of effects and assessment made in the DCO application, that the proposed change would not introduce any new or different likely significant environmental effects from that reported in chapter D6 (APP-125) the Environmental Statement.	
Environmental Statement chapter D9	APP-128	Terrestrial and freshwater ecology	As outlined in paragraphs 2.5.51 to 2.5.71, the proposed change would not significantly alter the assessment of effects to terrestrial and freshwater ecological receptors due to changes in air quality or levels of noise and/or lighting disturbance. This assessment takes account of new mitigation proposed to address potential lighting effects to buffer zones along watercourses within the Wylfa Newydd Development Area. Thus, there is considered to be no new or different likely significant environmental effects on terrestrial	Non-material change

Document name	Examination Reference Number	Document/chapter/section name	Likely effect of the changes	Material change/non-material change/no change
			and freshwater ecology receptors and the conclusions presented in chapter D9 (APP-128) of the Environmental Statement would remain as reported.	
Environmental Statement appendix D10-10	APP-201	Environmental Lighting Impact Assessment	As outlined in Table 2-10, the proposed change to working hours would have potential lighting impacts on eight receptors (five ecological receptors already considered in the DCO application and three new residential receptors). Updated lighting modelling results confirmed there would be no change to the assessment of effects at four ecological receptors and negligible effect at the three new residential receptors. For the two remaining ecological receptors (buffer zones along the waterbody within the Wylfa Newydd Development Area and Mynydd Ithel Fam), the proposed change was predicted to result in a greater effect. However, with consideration of existing and enhanced mitigation, which is detailed in Table 2-10, the potential magnitude of effect at these receptors would reduce to that reported in the DCO application. Thus, there is considered to be no new or different likely significant environmental effects identified and the assessment presented in appendix D10-10 (APP-201) would remain as reported.	Non-material change

Document name	Examination Reference Number	Document/chapter/section name	Likely effect of the changes	Material change/non-material change/no change
Environmental Statement chapter D13	APP-132	The marine environment	As outlined in paragraphs 2.5.87 to 2.5.97, the proposed change would not significantly alter the assessment of effects to fish receptors, marine mammals and seabirds (target and secondary species) due to: 1) visual disturbance from lighting and presence of personnel; and 2) airborne noise disturbance. This is primarily because 24-hour works in marine construction were already considered in the assessment and mitigation was secured in the DCO to address effects to the breeding tern colony in Cemlyn Lagoon. Thus, there is considered to be no new or different likely significant environmental effects to the marine environment assessment and the conclusions presented in chapter D13 of the Environmental Statement (APP-132) remain as reported.	No change
Environmental Statement, chapter D16	APP-135	Combined topic effects	Based on the assessments outlined in each topic specific assessment, the combined topic effect assessment in paragraphs 2.5.98 to 2.5.108 and the inclusion of enhanced mitigation, there are no new or different likely significant combined effects that would arise as a result of the proposed change. Consequently, the combined topic effects assessment remains as reported in chapter D16 (APP-135) of the Environmental Statement.	No change
Environmental Statement, chapter I4	APP-387	Intra-project cumulative effects	Based on the assessments outlined in section 2.5 (and summarised in this table) and the additional mitigation proposed with respect to air quality, noise	No change

Document name	Examination Reference Number	Document/chapter/section name	Likely effect of the changes	Material change/non-material change/no change
			and lighting effects, there are no new or different likely significant intra-project cumulative effects that would arise as a result of the proposed change. Consequently, the intra-project cumulative effects assessment remains as reported in chapter I4 (APP-387) of the Environmental Statement.	
Environmental Statement chapter I5	APP-388	Inter-project cumulative effects	Based on the assessments outlined in section 2.5 (and summarised in this table) and the additional mitigation proposed with respect to air quality, noise and lighting effects, there are no new or different likely significant inter-project cumulative effects that would arise as a result of the proposed change. Consequently, the inter-project cumulative effects assessment remains as reported in chapter I5 (APP-388) of the Environmental Statement.	No change
Shadow Habitats Regulations Assessment Report	APP-050/051	Appropriate assessment: Birds	As outlined in paragraphs 2.5.139 to 2.5.140, the proposed change would not significantly alter the appropriate assessment for the tern colony at Cemlyn Lagoon due to: 1) visual disturbance from lighting and presence of personnel; and 2) airborne noise disturbance. This is primarily because 24-hour works in marine construction were already considered in the assessment and mitigation was secured in the DCO to address effects to the breeding tern colony in Cemlyn Lagoon. Additionally, as outlined in paragraph 2.5.140, the proposed change would not significantly alter the appropriate assessment for the vegetated shingle	No change

Document name	Examination Reference Number	Document/chapter/section name	Likely effect of the changes	Material change/non-material change/no change
			ridge that forms a qualifying feature of the Cemlyn Bay SAC as a result of changes in air quality. Thus, there is considered to be no new or different likely significant environmental effects and therefore no change to the appropriate assessment for birds and for the vegetated shingle ridge that forms a qualifying feature of the Cemlyn Bay SAC and the conclusions of the Shadow Habitats Regulations Assessment Report (APP-050/051) remain as reported.	
Health Impact Assessment Report	APP-429	Air quality (HIA section D.2) Noise (HIA section D.3 Noise) Lighting (HIA section D.4)	As outlined in paragraphs 2.5.109 to 2.5.134, the proposed change has the potential to result in more adverse conclusions for air quality and noise related health effects compared to those reached in the Health Impact Assessment Report (APP-429) submitted as part of the DCO application. However, in relation to the proposed change additional mitigation has been considered. The commitment to higher emission standards for Project vehicles and plant would be likely to reduce the significance of potential adverse effects to population health from nitrogen dioxide. This additional mitigation which is already secured in the DCO would go beyond offsetting the effects of the proposed change and result in a more favourable conclusion for vehicle and plant related emissions compared to that reported in the HIA submitted as part of the DCO application. The expansion of the LNMS is likely to reduce the potential for significant adverse population health effects associated with night-time sleep	Non-material change

Document name	Examination Reference Number	Document/chapter/section name	Likely effect of the changes	Material change/non-material change/no change
			disturbance. Assuming such expansion would be commensurate with the extent and magnitude of the change, this additional mitigation would be expected to offset the effects of the proposed change, with no change to the conclusions of the Health Impact Assessment Report (APP-429) submitted as part of the DCO application. No new or different likely significantly different light related health effects have been identified as a consequence of the proposed change and therefore the conclusions related to this effect would remain as reported in the HIA submitted as part of the DCO application.	
Equality Impact Assessment	APP-434	7 What are the potential equality effects of the Wylfa Newydd DCO Project?	As outlined in paragraphs 2.5.135 to 2.5.138, considering the adoption of the lower emitting plant, machinery and marine vessels, the proposed change to working hours are not considered to represent a material change to the air quality assessment, and the conclusion of no significant effect presented in chapter D5 (APP-124) of the Environmental Statement remains as reported. On this basis it is considered that the conclusions reached in the Equality Impact Assessment (APP-434) in relation to potential air quality effects on equality from the Project's construction activities would remain unchanged. Therefore, no significant health and no disproportionate or differential equality effects are expected as a result of the proposed change.	Non-material change

Document name	Examination Reference Number	Document/chapter/section name	Likely effect of the changes	Material change/non-material change/no change
			There would be a significant reduction in major significant noise effects with the enhanced LNMS and overall the equality effects reported in the Equality Impact Assessment (APP-434) with regards to noise effects from construction activities would remain unchanged. Furthermore, no additional noise effects for educational facilities or places of worship were identified. Therefore, the conclusions of the Equality Impact Assessment (APP-434) with regards to noise effects from construction activities on these receptors remain unchanged.	

2.6 Schedule of engagements

Table 2-13 Schedule of engagements

Date	Event
17 October 2018	Horizon wrote to PINS, submitting Batch 1 Requests for Non-Material Change (Blasting Strategy and Marine Vessel Movements) and advising of an emerging Batch 2 (Working Hours, Shift Patterns and HGV Deliveries)
23 October 2018	Preliminary Meeting
31 October 2018	Horizon's letter of 17 October 2018 accepted at the discretion of the Examining Authority (AS-011)
31 October 2018	First notice advertising consultation on Batch 2 (8 November to 6 December 2018) published in The Daily Post
7 November 2018	Second notice advertising consultation on Batch 2 (8 November to 6 December 2018) published in The Daily Post, and also in the London Gazette
8 November 2018	28-day consultation on Batch 2 begins
19 November 2018, 1-7pm	Horizon Open Surgery at Cemaes Village Hall, attended by Batch 2 consultation team
8 November 2018	28-day consultation on Batch 2 begins
19 November 2018, 1-7pm	Horizon Open Surgery at Cemaes Village Hall, attended by Batch 2 consultation team
6 December 2018	28-day consultation on Batch 2 ends
7-17 December 2018	Expected dates during which Horizon will have regard to representations received and update consultation documents as required
18 December 2018 (Exam Deadline 3)	Earliest expected date for submission into Examination of second batch of formal requests for non-material change
17 January 2019 (Exam Deadline 4)	Latest expected date for submission into Examination of second batch of formal requests for non-material change
23 April 2019	End of Examination

2.6.1 As noted in section 1.4.5, copies of the consultation documents are available for public viewing at:

- The Anglesey Business Centre, Isle of Anglesey County Council, Bryn Cefni Business Park, Llangefni, Anglesey, LL77 7XA, Monday to Friday 9am to 5pm, and
- Wylfa Newydd Site Office, Cemaes Bay, Anglesey, LL67 0AA, Monday to Friday 9am to 5pm by appointment only, or
- on Horizon's consultation website, www.horizonnuclearpower.com/consultation.

2.6.2 List of specified consultees (prescribed persons under section 42(a)-(d) of the Planning Act 2008):

- Welsh Government
- Natural Resources Wales
- Isle of Anglesey Council
- Gwynedd Council
- Conwy County Borough Council
- North Wales Economic Ambition Board
- North Wales Wildlife Trust
- RSPB Cymru
- National Trust
- The Crown Estate
- Betsi Cadwaladr University Health Board
- Public Health Wales
- Welsh Ambulance Service Trust
- North Wales Police
- RAF Valley
- North Wales Fire and Rescue Service
- National Grid
- Welsh Water
- North & Mid Wales Trunk Road Agency
- The Marine Management Organisation
- North West & North Wales Sea Fisheries Committee x
- The Maritime & Coastguard Agency
- Marine Conservation Trust
- Royal National Lifeboat Institution
- The Maritime & Coastguard Agency
- SP Manweb plc
- Magnox
- Nuclear Decommissioning Authority
- North Anglesey Partnership
- Destination Anglesey Partnership
- North Wales Economic Ambition Board
- Trinity House
- Joint Nature Conservation Committee
- Cyngor Tref Amlwch (Town Council)
- Cyngor Cymuned Cylch-Y-Garn (Community Council)

- Cyngor Cymuned Llanbadrig
- Cyngor Cymuned Mechell
- Cyngor Cymuned Llaneilian
- Cyngor Cymuned Rhosybol
- Bodedern Community Council
- Bryngwran Community Council
- Llanfachraeth Community Council
- Llanfaethlu Community Council
- Trearddur Community Council
- Valley Community Council
- Llanfair yn Neubwll Community Council
- Talybolion Local Members
- Twrcelyn Local Members

2.6.3 Targeted mail drops:

- Main Site – regular list of near neighbours, comprising 909 addresses in Cemaes and Tregele
- A5025 corridor – list of addresses (within 1km wide corridor along the A5025 from Main Site to and including Valley) used for on-line road consultations for applications under the Town & Country Planning Act 1990 – 1,679 addresses
- Logistics Centre, Parc Cybi – a new zone of 750m radius from the Centre, comprising 67 residential and business addresses
- Park and Ride, Dalar Hir – a new zone based on a 1,250m radius, with the addition of some further residential receptors close to the zone, comprising a total of 363 addresses
- TOTAL: 3,018 addresses.

2.6.4 Site notices:

- 22 locations around Anglesey

2.6.5 The proposed changes do not require any 'additional land', so Horizon does not consider that the consent of persons with an interest in the relevant land is required under the Infrastructure Planning (Compulsory Acquisition) Regulations 2010. However, letters providing information about the consultation have been sent to persons with an interest in land relating to the Main Site, A5025, Parc Cybi and Dalar Hir, comprising approximately 850 addresses.

2.6.6 Horizon's letter to the Planning Inspectorate of 17 October 2018 (AS-011) (notifying of the emerging second batch of non-material changes) advised that Horizon did not propose to undertake 'roadshow' type events as part of the consultation, but instead to undertake consultation on a written basis only (due to the scheduled hearings and other demands of the examination process on stakeholders). However, Horizon has identified an opportunity to send a Batch

2 consultation team to one of the regular 'Open Surgeries' hosted at Cemaes Village Hall, thereby giving stakeholders an opportunity to discuss the Batch 2 changes in person, as noted in the schedule of engagements above.

2.7 Schedule of consequential amendments to application documents

Table 2-14 Schedule of consequential amendments to application documents

Application document name	Examination Reference Number	Section of document	Version to be amended	Description of amendment
Environmental Statement chapter D1 Proposed Development	APP-120	1.6	1.0	Update to table D1-7 and the general text which outlines the site operation hours.
Environmental Statement chapter D5: air quality (excluding emissions from traffic)	APP-124	5.5, 5.6 and 5.7	1.0	Update results (including those in the relevant tables), description of the proposed additional mitigation and the residual effects.
Environmental Statement appendix D5-2: Dispersion modelling of emissions to atmosphere arising from main site	APP-140	2.2, 2.3, 2.4 and 3, appendices A, D, E	1.0	Update modelling scenarios and input data, air quality modelling results and related dispersion isopleths.
Environmental Statement chapter D6 Noise and vibration	APP-125	6.4, 6.6 and 6.7	1.0	The construction noise assessment scenario would require amendment to reflect changes to the phasing of construction activities, and two additional scenarios for months 7-9 and 10-12 would need to be added. Additions to the commitments made in respect of the Local Noise Mitigation Strategy set out in table D6-32 would also be required. The property counts for residual effects within table D6-35 would require updating.
Appendix D6-1 Noise modelling inputs and results	APP-142	1.2, 2.0	1.0	Update to reflect amendments to the indicative plant list/schedule. Results tables 2-1 through to 2-41 would require updates to reflect

Application document name	Examination Reference Number	Section of document	Version to be amended	Description of amendment
				the results of the proposed change.
Environmental Statement chapter D9 Terrestrial and freshwater ecology	APP-128	9.5	1.0	Updates to air quality assessment of sensitive ecological receptors in light of the lower emitting plant, machinery and marine vessels used rather than as a direct result of changes in working hours.
Environmental Statement chapter D9 Terrestrial and freshwater ecology	APP-128	9.5	1.0	Updates to noise assessment for chough, breeding birds (barn owl), and bats.
Environmental Statement appendix D10-10: Environmental Lighting Impact Assessment	APP-201	1.2	1.0	Update to figure 1-1 (Receptor Locations) to include newly identified potential receptors: Gof Isaf bat barn and the four new residential receptors.
Environmental Statement appendix D10-10: Environmental Lighting Impact Assessment	APP-201	1.4	1.0	Update to include a baseline description of newly identified potential receptors.
Environmental Statement appendix D10-10: Environmental Lighting Impact Assessment	APP-201	1.5	1.0	Update to table 1-4 and the following description to provide assumptions on the lighting of haul routes and the proposed change to working hours for each construction zone where relevant.
Environmental Statement appendix D10-10: Environmental Lighting Impact Assessment	APP-201	1.6	1.0	The construction effects would need to be updated to include the effects on the newly identified receptors, as well as the change in potential magnitude of effects as a result of the proposed change to working hours and associated lighting of haul routes.
Environmental Statement appendix D10-10:	APP-201	1.7	1.0	Update to additional mitigation to include new proposed measures.

Application document name	Examination Reference Number	Section of document	Version to be amended	Description of amendment
Environmental Lighting Impact Assessment				
Environmental Statement appendix D10-10: Environmental Lighting Impact Assessment	APP-201	1.8	1.0	Update to table 1-8 to include the additional receptors, to revise the potential magnitude of change where relevant and to include proposed additional mitigation.
Environmental Statement chapter D13: The marine environment	APP-132	13.5.34	1.0	Update to working hours for drilling activities (to be amended to state 24-hour operations as it currently states 07:00 to 19:00)
Environmental Statement WNDA Development Figure Booklet – Volume D	APP-237	Figure D5-5 and D6-2	1.0	Update to reflect changes to haul road locations.
Environmental Statement WNDA Development Figure Booklet – Volume D	APP-237	Figures D5-7 to D5-11	1.0	Updates to changes in nitrogen dioxide concentrations.
Environmental Statement WNDA Development Figure Booklet – Volume D	APP-237	Figures D6-3 to D6-10	1.0	Updates to construction noise levels.
Environmental Statement chapter I4 intra-development cumulative effects	APP-387	4.2	1.0	Update to noise and vibration assessment.
Environmental Statement chapter I4: Intra-project cumulative effects	APP-387	4.2	1.0	Update to air quality modelling results.
Environmental Statement appendix I4-2: Project-wide and WNDA development intra-project air quality assessment	APP-393	5	1.0	Update to air quality modelling results.
Environmental Statement chapter I5 inter-development cumulative effects	APP-388	5.2	1.0	Update to noise and vibration assessment.
Health Impact Assessment Report	APP-429	D.2.16 and D.2.17	1.0	Revise air quality conclusions to negligible

Application document name	Examination Reference Number	Section of document	Version to be amended	Description of amendment
				for the general population and minor adverse for sensitive groups. Some narrative discussion relating to this change may be appropriate.
Health Impact Assessment Report	APP-429	D.2.10 and D.2.11	1.0	Consider revising magnitude discussion and scoring to reflect lower nitrogen dioxide levels. Magnitude score may change from medium to small.
Health Impact Assessment Report	APP-429	D.3.26	1.0	Add further detail on the extended Local Noise Mitigation Strategy. E.g. in relation to wider area, replacement garden fences and compensation.
Health Impact Assessment Report	APP-429	D.3.30	1.0	Update number of residential receptors experiencing EIA major adverse significant effects from 321 to 257.
Health Impact Assessment Report	APP-429	Table P-1	1.0	Update summary table of effects in relation to air quality changes
Equality Impact Assessment	APP-434	7.2	1.0	Updates to numbers of residential receptors significantly affected by traffic noise.
Wylfa Newydd Development Area and Power Station Site Plans	APP-014/015	N/A	1.0	Update the following figures to reflect changes to haul routes Wylfa Newydd Development Area Reference Points 1, 2, 3 and 4.
Draft Development Consent Order	APP-029	Schedule 4	1.0	Update description of working hours
Wylfa Newydd Code of Construction Practice	APP-414	4.3, 7.0, 8.0	1.0	Update description of working hours and the relevant management strategies related to the topic assessments where changes from the DCO application have been identified.
Main Power Station Site sub-CoCP	APP-415	4.3, 7.0, 8.0	1.0	Update description of working hours and the

Application document name	Examination Reference Number	Section of document	Version to be amended	Description of amendment
				relevant management strategies related to the topic assessments where changes from the DCO application have been identified.
Marine Works sub-CoCP	APP-416	4.3, 7.0, 8.0	1.0	Update description of working hours and the relevant management strategies related to the topic assessments where changes from the DCO application have been identified.

3 References

Table 3-1 Schedule of references

ID	Reference
RD1	The Planning Inspectorate. 2018. Advice Note 16: How to request a change which may be material. [Online]. [Accessed: June 2018]. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/07/Advice-note-16.pdf
RD2	Department of Energy and Climate Change. 2011. Overarching National Policy Statement for Energy (EN-1). [Online]. [Accessed: 02 July 2018]. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf
RD3	Department of Energy and Climate Change. 2011. National Policy Statement for Nuclear Power Generation (EN-6). [Online]. [Accessed: 02 July 2018]. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47859/2009-nps-for-nuclear-volumeI.pdf
RD4	Department for Business, Energy and Industrial Strategy. 2017. Statement on Energy Infrastructure. [Online] [Accessed: 22 October 2018]. Available from: https://www.parliament.uk/business/publications/written-questions-answers-statements/written-statement/Lords/2017-12-07/HLWS316/
RD5	Adrienne Stratford (Welsh Chough Project) / RSPB pers. comm. in March and June 2017
RD6	World Health Organization Regional Office for Europe. (2009) Night noise guidelines for Europe. (Copenhagen, Denmark). http://www.euro.who.int/__data/assets/pdf_file/0017/43316/E92845.pdf

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Appendix 1-1 Cumulative assessment report

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Appendix 1-2 Further before and after extracts

Figure 3-1 Figure D5-5 as submitted in the DCO application

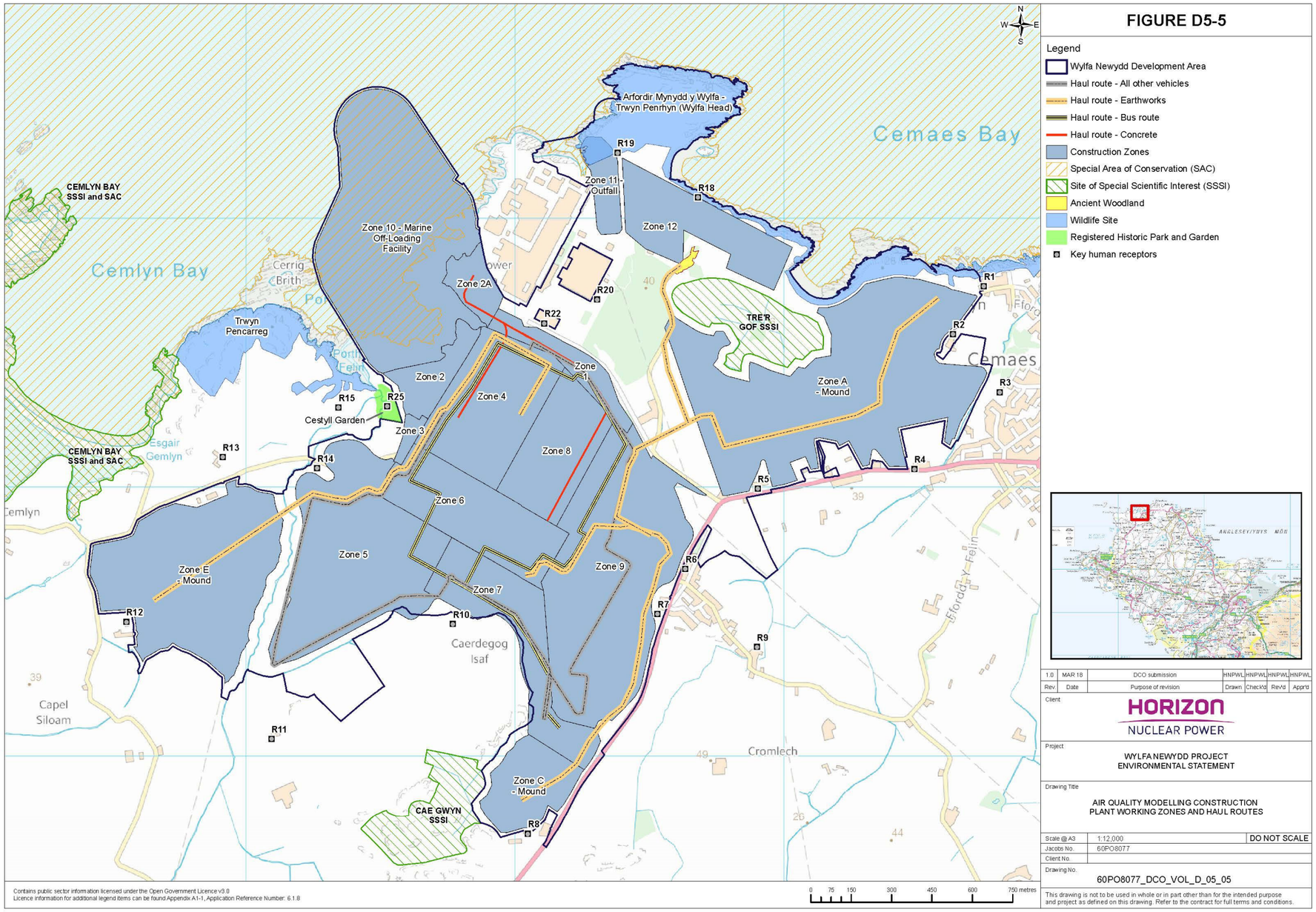
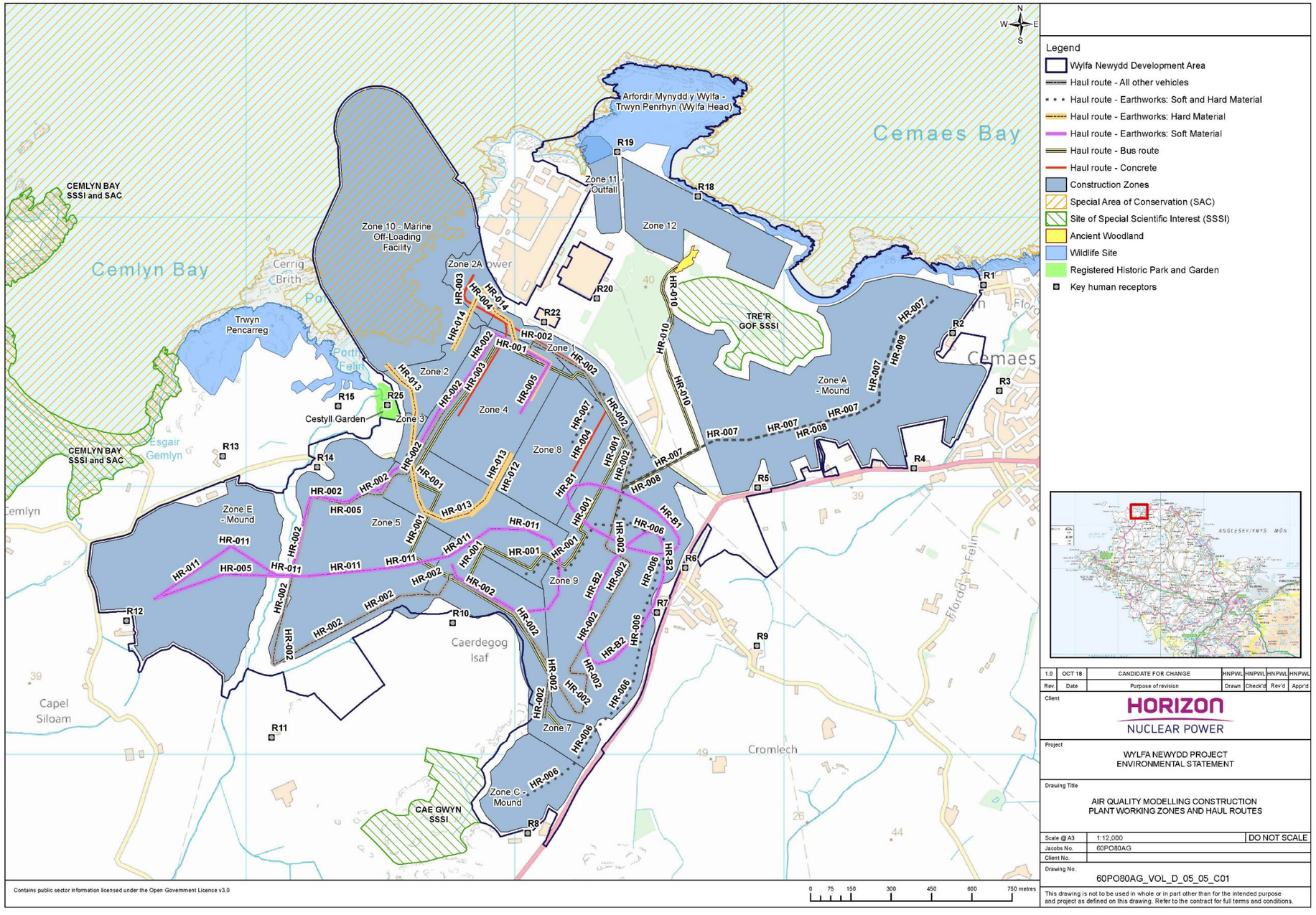


Figure 3-2 Amended figure D5-5 as a result of the proposed change



Appendix 1-1 Cumulative assessment report

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Contents

List of Tables

1 Introduction

1.1.1 Horizon intends to make a request for a total of five non-material changes to the Project DCO application. Horizon has already consulted and submitted the following two non-material change requests:

- Request for Non-Material Change no.1 – Blasting Strategy (AS-012); and
- Request for Non-Material Change no.2 – Marine Vessel Movements (AS-013).

1.1.2 Horizon has also gone out to consultation with respect to the following three non-material change requests:

- Request for Non-Material Change no.3 – Worker Shift Patterns;
- Request for Non-Material Change no.4 – Working Hours; and
- Request for Non-Material Change no.5 – HGV delivery window.

1.1.3 Further information related to each non-material change is provided in section 1.2 below; detailed assessments can be found in the standalone candidate for change documents.

1.2 Scope

1.2.1 This appendix (which is attached – in duplicate form – to documents 3, 4 and 5 listed above) sets out an assessment of the effects of all five proposed non-material changes to the cumulative assessment reported in the DCO application. The purpose is to assess whether the proposed changes could interact to result in the Project having a greater cumulative effect to that reported in the DCO application. The effect of each separate request for non-material change on the cumulative assessment reported in the DCO application has been assessed and reported within the standalone candidate for change documents.

1.2.2 The approach to the cumulative assessment of the proposed changes is consistent with the Project Environmental Impact Assessment (EIA); see chapter B1 (introduction to the assessment process, APP-066) of the Environmental Statement for an overview of this process. There are three components to the assessment of cumulative EIA effects: combined topic effects; intra-project effects; and inter-project effects, and all are described further below.

1.2.3 Combined topic effects (also known as intra-development effects) occur when a single receptor is affected in more than one way by the same development. Combined topic effects for each development comprising the Project are reported in chapters C7 (Project-wide effects, APP-094), D16 (WNDA Development, APP-135), E12 (Off-Site Power Station Facilities: AECC ESL and MEEG, APP-250), F12 (Park and Ride, APP-227), G12 (A5025 Off-line Highway Improvements, APP-315) and H12 (Logistics Centre, APP-366) of the Environmental Statement.

1.2.4 Intra-project effects result from the various developments that comprise the Project, whilst inter-project effects result from the Wylfa Newydd Project

together with external projects. These assessments are reported in volume I (cumulative effects) (APP-384 to APP388) of the Environmental Statement.

1.2.5 Consideration has also been given to the cumulative effects of the proposed changes to the Health Impact Assessment Report (APP-429) and the Shadow Habitats Regulations Assessment Report (APP-050/051) and a conclusion of no new cumulative or in-combination effects has been reached, respectively.

1.2.6 All other assessments submitted as part of the DCO application (e.g. Welsh Language Impact Assessment, APP-432; Equality Impact Assessment, APP-434; and Water Framework Directive Compliance Assessment, APP-444) would remain unaffected by the proposed changes and have therefore not been considered further.

1.3 Assessment approach

1.3.1 For the purpose of the assessment and in order to assess a worst case, it is assumed that the proposed changes and the associated construction activities and environmental effects would occur concurrently. This is considered worst case as in reality the proposed changes are unlikely to fully overlap with one another (e.g. blasting activities will occur earlier in the programme than marine vessel movements but are estimated to overlap for approximately 8 months).

Assessment of noise effects

1.3.2 The noise assessments for each of the following requests for non-material change identified the potential for new or different likely significant environmental effects:

- Request for Non-Material Change no.4 – Working Hours; and
- Request for Non-Material Change no.5 – HGV delivery window.

1.3.3 However, implementation of a Local Noise Mitigation Strategy (LNMS) for the Project, as well as other mitigation measures secured in the Wylfa Newydd Code of Construction Practice (CoCP) (APP-414), will reduce the assessment of effects arising from the proposed changes. With the potential for some small increases in the number of adverse effects, including cumulatively, a number of options for new and enhanced mitigation have been proposed. Included in these options is an extension to the commitment made in the LNMS set out in section 8.3 of the Wylfa Newydd CoCP (APP-414) irrespective of the proposed changes to working hours and the HGV delivery window (Requests for Non-Material Change no. 4 and 5). This extension will on balance mitigate the worse affected properties and reduce major significant effects identified in the DCO application and as of the proposed change.

1.3.4 On the basis of this mitigation, the noise and vibration topic assessment for the proposed change to working hours and the HGV delivery window (Requests for Non-Material Change no. 4 and 5) concluded that on balance, there would be no new or different likely significant environmental effects. However, the potential cumulative effect of changes to noise disturbance as a result of the five requests for non-material change to the DCO application has been considered within this appendix (see sections 2 to 4).

Assessment of air quality effects

1.3.5 The air quality dispersion modelling which was undertaken to assess the air quality effects of the proposed change to working hours (Request for Non-Material Change no. 4) took into consideration Horizons' pre-existing commitment within the DCO application to use lower emitting plant, machinery and marine vessels proposed as additional mitigation. It also took account of the proposed change to the marine vessel movements (Request for Non-Material Change no. 2) which has been submitted to the Examining Authority.

1.3.6 Although air quality modelling work was undertaken to assess the proposed change to worker shift patterns and the HGV delivery window (Requests for Non-Material Change no. 3 and 5), there was no requirement to take account of any pre-existing mitigation commitments within the DCO application. The proposed change to the blasting strategy (Request for Non-Material Change no. 1) relates to the timings for carrying out blasting and has no effect on the amount or magnitude of blasting required. Therefore, this proposed change does not affect the assessment of air quality effects reported in the DCO application.

1.3.7 As expected, the lower emitting construction plant, machinery and vessels delivered significant reductions in air quality effects. The effect of the proposed changes to working hours (Request for Non-Material Change no. 4) have therefore been assessed against the quantified residual effects of the two modelling scenarios (for year 2 and year 5) which take account of this mitigation as this is considered to be a more appropriate baseline scenario than the DCO application which does not quantify this mitigation within the modelling assessments (see paragraphs 2.5.2 to 2.5.4 of the request for non-material change to working hours). This forms the basis of the cumulative assessment.

Assessment of human health impacts

1.3.8 The Health Impact Assessment has adopted the same assessment approach to mitigation as the noise and air quality assessments described above. This forms the basis of the cumulative assessment.

1.4 Description of the proposed non-material changes

1.4.1 A detailed description of the five proposed non-material changes being sought by Horizon, including a justification for their requirement and non-materiality can be found in the standalone candidate for change documents.

1.4.2 For reference, a brief description of each proposed non-material change is provided in Table 1-1 below.

Table 1-1 Proposed non-material changes to the DCO application being sought by Horizon

Proposed non-material change	Description
Request for Non-Material Change no.1 – Blasting Strategy (AS-012)	Horizon is seeking an extension to the daily time frame within which blasting for the Main Construction works is permitted, from: Monday to Friday between 10:00 and 16:00, and Saturday between 10:00 and 13:00 (as submitted in the DCO application); to Monday to Friday between 09:00 and 19:00, and Saturday between 08:00 and 13:00 (with no blasting after dusk between March and September). In practice, because of the change in length of day and the change to BST, dusk falls after 19:00 from April until September.
Non-Material Change no.2 – Marine Vessel Movements (AS-013)	Horizon is seeking to increase the upper daily limit from four movements per day (two vessels) to 16 movements per day (eight vessels). These changes fall within the total vessel movements described and assessed in the DCO application.
Request for Non-Material Change no.3 – Worker Shift Patterns	Horizon is also seeking the following changes to shift times and durations: • increase the day shift windows by half hour at the end of each shift; • amend the start of the night shift window by three hours; and • decrease the night shift window by half hour during peak construction (e.g. 2023).
Request for Non-Material Change no.4 – Working Hours	Horizon is seeking to extend the following working hours to include 19:00-07:00 hours (i.e. 24-hours) for: • marine piling (percussion piling to 19:00 only); • MOLF construction • preparation for blasting including rock drilling and packing for blasting; • moving/repositioning won rock in the excavations; and • support operations which covers a range of activities required to support the early works and Main Construction As a consequence of the proposed change to working hours and to reduce overall environmental effects from those reported in the DCO application, Horizon is also

Proposed non-material change	Description
	seeking an extension to the working hours for site grading in construction zones 6, 7, 8 and 9 and the transportation of resultant material on haul routes HR-013, HR-B1 and HR-B2 for the construction of Mound E and Mound B from 19:00 to 23:00.
Request for Non-Material Change no.5 – HGV delivery window	Horizon is seeking to extend the weekday (Monday to Friday inclusive) delivery window into the evening, to include deliveries between the hours of 19:00 and 23:00 (up to a maximum of 20 HGV movements in each direction). Furthermore, an additional delivery window is proposed on Saturday mornings, between 08:00 and 13:00 (up to a maximum of 50 HGV movements in each direction).

2 Combined topic effects (i.e. intra-development cumulative effects)

2.1.1 The proposed changes to worker shift patterns and the HGV delivery window (Requests for Non-Material Change no. 3 and 5) have potential implications to the assessment of project-wide effects outlined in volume C of the Environmental Statement. The remaining proposed changes to the blasting strategy, marine vessel movements, and working hours (Request for Non-Material Change no. 1, 2 and 4) relate specifically to the WNDA Development which is assessed in volume D of the Environmental Statement (Table 2-1).

2.1.2 Thus, this section examines the potential effect of the proposed changes to the combined topic effects assessments presented within chapter C7 (APP-094) (project-wide effects) and D16 (APP-135) (WNDA Development) of the Environmental Statement.

Table 2-1 Summary matrix of the non-material change requests and the developments effected

Proposed non-material change	Project-wide effect (volume C)	WNDA Development (volume D)
Request for Non-Material Change no.1 – Blasting Strategy (AS-012)		X
Non-Material Change no.2 – Marine Vessel Movements (AS-013)		X
Request for Non-Material Change no.3 – Worker Shift Patterns	X	
Request for Non-Material Change no.4 – Working Hours		X
Request for Non-Material Change no.5 – HGV delivery window	X	

The proposed changes do not affect assessments of combined topic effects relating to the Off-Site Power Station Facilities: AECC ESL and MEEG (volume E), Park and Ride (volume F), A5025 Off-line Highway Improvements (volume G) and the Logistics Centre (volume H) as there is no pathway of effect to receptors considered within these assessments. Therefore, the assessment of combined topic effects for these developments remain as reported in chapters E12 (APP-250), F12 (APP-277), G12 (APP-315) and H12 (APP-366) of the Environmental Statement.

2.2 Project-wide combined topic effects

2.2.1 The project-wide combined topic effects assessment of each of the proposed changes to worker shift patterns and the HGV delivery window (Requests for Non-Material Change no. 3 and 5), concluded no change to the assessment and conclusions presented in chapter C7 (APP-094) of the Environmental Statement.

2.2.2 Considering these proposed changes together, it was identified that there could be effects to the following receptors via the traffic and transport, and public access and recreation project-wide topic assessments (see Table 2-2):

- Motorised and public transport users (traffic and transport);
- Recreational cyclists and walkers (public access and recreation); and
- Active travel cyclists and walkers (public access and recreation).

Table 2-2 Topic assessments and receptors potentially affected by the proposed changes to worker shift patterns and the HGV delivery window (adapted from appendix C7-1 (APP-118))

Proposed non-material change	Socio-economics	Traffic and transport	Public access and recreation	Air quality	Noise and vibration	Waster and materials management
Motorised and public transport users		Y				
Recreational cyclists and walkers			Y			
Active travel cyclists and walkers			Y			

2.2.3 As a consequence of the proposed changes to worker shift patterns and HGV delivery windows, no new receptors would be scoped into the project-wide combined topic effects assessment.

Traffic and transport

2.2.4 The proposed changes to worker shift patterns and the HGV delivery window (Requests for Non-Material Change no. 3 and 5) both have the potential to alter traffic flows, and in the case of Saturday morning HGV deliveries, introduce new construction-related traffic from that assessed within the DCO application.

2.2.5 The traffic and transport assessment for the proposed changes to shift patterns (Request for Non-Material Change no. 3) and the HGV delivery window (Request for Non-Material Change no. 5) each concluded that there would be no new or different likely significant combined effects than those reported in chapter C7 (APP-094) of the Environmental Statement.

2.2.6 When considering these two proposed changes in combination, the only potential for a cumulative effect to occur is during the weekday evenings around the commencement of the evening night shift (i.e. 19:00) as HGV deliveries would continue past 19:00. There would be no overlap in the timing of worker shift patterns (which means workers arrive at the Wylfa Newydd Development Area before 08:00) and the HGV delivery window on Saturdays (which ensures there are no HGV movements before 08:00) and so any impacts of these proposed changes are considered independent of one another.

2.2.7 If HGV movements were to be introduced in the evenings, the number of HGV movements in the hour that overlaps with worker traffic movements associated with the proposed change to shift patterns would be small (an average of five HGVs per direction). Lower background traffic flows in the evening period mean that impacts should be less than those assessed during peak hours of traffic on the road network. Furthermore, in practice the proposed change would reduce peak hourly flows during the day as the same number of HGV deliveries would occur over a greater time period. Given the limited temporal overlap of the two proposed changes and the small vehicle numbers involved, there would be no new or different likely cumulative transport impacts.

2.2.8 Consequently, there is considered to be no change to the assessment of combined topic effects to motorised and public transport users presented within chapter C7 (APP-094) of the Environmental Statement. Thus, the conclusions remain as reported in the DCO application.

Public access and recreation

2.2.9 The proposed changes to shift patterns and the HGV delivery window both have the potential to affect recreational amenity value as well as active travel for walkers and cyclists as a result of changes to, or increased traffic flows.

2.2.10 The public access and recreation assessment for the proposed changes to worker shift patterns (Request for Non-Material Change no. 3) and the HGV delivery window (Request for Non-Material Change no. 5) each concluded that with consideration of existing embedded and additional mitigation measures already secured in the DCO application, there would be no new or different likely significant combined effects than those reported in chapter C7 (APP-094) of the Environmental Statement.

2.2.11 The proposed change to the HGV delivery window (Request for Non-Material Change no. 5) was found to alter the assessment of recreational amenity for walkers and cyclists from negligible to minor adverse effects due to the addition of HGV deliveries during weekday evenings and Saturdays. Minor changes to peak traffic flows associated with the proposed change to worker shift patterns (Request for Non-Material Change no. 3) are not considered to combine to worsen the effect to this receptor.

2.2.12 Both proposed changes would not result in a net change in the number of vehicles or HGVs using the road network as a result of the Project. Considering the smaller number of HGV deliveries that would be permitted weekday evenings and on a Saturday morning and the timing of shift changes,

there are considered to be no new or different likely cumulative impacts to public access and recreation.

2.2.13 Consequently, there is considered to be no change to the assessment of combined topic effects to walkers and cyclists undertaking recreation or active travel presented within chapter C7 (APP-094) of the Environmental Statement. Thus, the conclusions remain as reported in the DCO application.

2.3 WNDA Development combined topic effects

2.3.1 The WNDA Development combined topic effects assessment for each of the proposed changes to the blasting strategy, marine vessel movements and working hours (Request for Non-Material Change no. 1, 2 and 4), concluded no change to the assessment and conclusions presented in chapter D16 (APP-135) of the Environmental Statement.

2.3.2 Considering these proposed changes together, it was identified that there could be a change to the WNDA Development combined topic assessment for the following receptors (which are already considered in chapter D16 (APP-135) of the Environmental Statement) via the air quality and noise and vibration topic assessments (Table 2-3):

- Human receptors:
  - i) residential receptors within 350m of the Wylfa Newydd Development Area.
- other receptors:
  - ii) bats; and
  - iii) marine mammals (pinnipeds and cetaceans).

2.3.3 As a consequence of the proposed changes to the blasting strategy, marine vessel movements and working hours, no new receptors would be scoped into the WNDA Development combined topic effects assessment.

Table 2-3 Topic assessments and receptors potentially affected by the proposed changes to the blasting strategy, marine vessel movements and working hours (denoted by 'Y'), as well as any other topics which affect the same (or similar) receptors but are not affected by the proposed changes (denoted by 'X') (adapted from appendix D16-1 (APP-236))

Proposed non-material change	Socio-economics	Public access and recreation	Air quality	Noise and vibration	Soils and geology	Surface water and groundwater	Terrestrial and freshwater ecology	Landscape and visual	Cultural heritage	Coastal processes and coastal geomorphology	Marine environment	Radiological effects	Shipping and navigation
Human receptors													
Residential receptors within 350m of the Wylfa Newydd Development Area			Y										
Other receptors													
Bats							Y						
Marine mammals (pinnipeds and cetaceans)											Y		

Human residential receptors

2.3.4 The proposed change to the blasting strategy, marine vessel movements, and working hours (Requests for Non-Material Change no. 1, 2 and 4) each have the potential to affect human residential receptors due to changes in noise and vibration effects. The proposed change to marine vessel movements and working hours also each have the potential to impact air quality. Those receptors potentially affected are likely to be located within 350m of the Wylfa Newydd Development Area which includes the majority of Tregele, the western half of Cemaes (i.e. those properties or locations to the west of the High Street) and several other properties located around the Wylfa Newydd Development Area.

2.3.5 The combined topic assessment for each of the proposed changes to the blasting strategy, marine vessel movements and working hours (Requests for Non-Material Change no. 1, 2 and 4) each concluded no change to the assessment and conclusions presented in chapter D16 (App-135) of the Environmental Statement. However, it is acknowledged that the proposed changes combined could result in an additive or combined effect which could lead to a change in the overall combined topic assessment for the WNDA Development.

2.3.6 The proposed change to marine vessel movements (Request for Non-Material Change no. 2) would result in a small increase in noise levels at 120 properties closest to the Wylda Newydd Development Area which would be undetectable to a person. As the proposed change to the blasting strategy (Request for Non-Material Change no. 1) would be subject to the noise and vibration control measures (including monitoring) set out in section 8 of the Main Power Station Site sub-CoCP and would include strict adherence to BS6472-2 [RD1], there would be no additive effect from these two proposed changes. This conclusion remains valid when the proposed change to working hours is also considered on the basis that new and enhanced mitigation has been offered to address any new or different likely significant noise disturbance effects associated with this proposed change.

2.3.7 The proposed changes to marine vessel movements and working hours (Requests for Non-Material Change no. 2 and 4) are both predicted to result in small changes in predicted concentrations of pollutants at human receptor locations, with some properties experiencing an additive effect. This change however, would be small and is not considered to alter the conclusions of the combined topic effects assessment presented in D16 (APP-135) of the Environmental Statement.

2.3.8 Overall, any changes to noise and air quality effects arising from the proposed changes to the blasting strategy (Request for Non-Material Change no. 1) would not combine to result in a change to the assessment of combined topic effects presented within chapter D16 (Application Number 6.4.16) of the Environmental Statement. Thus, the conclusions remain as reported in the DCO application

Other receptors

Bats

2.3.9 The proposed changes to the blasting strategy and working hours (Requests for Non-Material Change no. 1 and 4) both have the potential to affect bats via visual, noise and air quality disturbance effects as this crepuscular receptor is most active around dusk.

2.3.10 The terrestrial and freshwater ecology assessment for each of the proposed changes to the blasting strategy and working hours (Request for Non-Material Change no. 1 and 4) concluded that there would be no new or different likely significant combined effects than those reported in chapter D16 (APP-135) of the Environmental Statement.

2.3.11 Given the positive effects the lower emitting plant, machinery and marine vessels would have to air quality, the neutral effect of environmental lighting and the very minor changes to peak noise levels predicted as a result of the proposed changes, it is not considered that these effects would combine to alter the assessment of combined topic effects to bats presented within chapter D16 (APP-135) of the Environmental Statement. Thus, the conclusions remain as reported in the DCO application.

Marine mammals (pinnipeds and cetaceans)

2.3.12 The proposed changes to the marine vessel movements and working hours (Requests for Non-Material Change no. 2 and 4) both have the potential to affect marine mammals (pinnipeds and cetaceans) due to increases in underwater noise disturbance and the increased risk of vessel strikes associated with marine vessel movements.

2.3.13 The marine environment assessment for each of the proposed changes to the blasting strategy and working hours (Request for Non-Material Change no. 1 and 4) concluded that there would be no new or different likely significant combined effects than those reported in chapter D16 (APP-135) of the Environmental Statement.

2.3.14 Given that the assessment of underwater noise effects presented in chapter D13 (APP-132) of the Environmental Statement already takes into consideration 24-hr operations for marine dredging and that the overall number of vessel movements associated with the Project would be small, it is not considered that these effects would combine to alter the assessment of combined topic effects to marine mammals presented within chapter D16 (APP-135) of the Environmental Statement. Thus, the conclusions remain as reported in the DCO application.

3 Intra-project cumulative effects

3.1.1 An intra-project cumulative assessment has been undertaken for those topic assessments outlined in the Environmental Statement which are potentially affected by at least two of the non-material changes being sought in relation to the DCO application. The methodology used for the cumulative effects assessment has considered all residual effects that are minor adverse or greater.

Traffic and transport

3.1.2 Of the five requests for non-material change, the proposed change to worker shift patterns and the HGV delivery window (Request for Non-Material Change no. 3 and 5) have implications to the traffic and transport assessment reported in the DCO application. The potential effect of these proposed changes has already been assessed on a project-wide basis and is considered in section 2.2. Thus, there is no requirement to carry out an intra-project cumulative effects assessment for this topic.

Public access and recreation

3.1.3 Of the five requests for non-material change, the proposed changes to worker shift patterns and HGV delivery window (Request for Non-Material Change no. 3 and 5) have implications to the public access and recreation assessment reported in the DCO application. The potential effect of these proposed changes has already been assessed on a project-wide basis and is considered in section 2.2. Thus, there is no requirement to carry out an intra-project cumulative effects assessment for this topic.

Air quality

3.1.4 Of the five requests for non-material change, the proposed changes to worker marine vessels movements, shift patterns, working hours and the HGV delivery window (Request for Non-Material Change no. 2, 3, 4 and 5) have implications to both the project-wide and WNDA Development assessments of air quality. As such, there is potential for intra-project additive cumulative effects due to emissions to air from sources within the Wylfa Newydd Development Area and emissions from road traffic associated with the Wylfa Newydd Project.

3.1.5 The air quality assessment for the proposed changes associated with the WNDA Development demonstrated that, with the use of newer lower emitting plant, machinery and marine vessels, the majority of effects at human receptors would be negligible, and air quality effects as a consequence of the proposed change would be not significant.

3.1.6 The project-wide air quality assessment stated that there would be no net increase or decrease in the total vehicle flows on the road network. The changes would result in some modifications to the time of day or night upon which vehicles would arrive and depart from the Wylfa Newydd Development Area during construction. The assessments for the proposed changes to worker shift patterns and HGV movements (Request for Non-Material Change

no. 3 and 5) indicated that predicted concentrations or deposition rates are unlikely to be any higher than those presented in chapter C4 (APP-091) of the Environmental Statement. The assessments concluded that the balance of air quality effects at human receptors would remain predominantly negligible with some beneficial effects due to the A5025 Offline Highway Improvements.

3.1.7 Further consideration of the potential additive effects to air quality as a consequence of the proposed changes to worker shift patterns and HGV movements (Request for Non-Material Change no. 3 and 5) concluded no change to the intra-project cumulative assessment reported in the DCO application.

3.1.8 Air quality effects are local in scale; most air quality assessment methodologies in the UK only consider receptors within 200m of the road network when assessing emissions from road traffic and the largest effects are within very close proximity to the affected roads. Therefore, at most air quality sensitive receptors, the physical distance of the proposed changes listed associated with project-wide activities and those occurring at the WNDA Development would prevent intra-project cumulative air quality effects occurring.

3.1.9 However, there will be some receptors, particularly those close to the A5025 in the vicinity of the Wylfa Newydd Development Area, where there may be the potential for additive effects. However, given the negligible effect of the emissions from road traffic and minimal change in effects from the proposed changes to shift patterns and HGV deliveries (Requests for Non-Material Change no. 3 and 5), the intra-project cumulative effect of all the proposed changes is considered to be negligible.

3.1.10 The proposed changes are not considered to alter the intra-project cumulative effects reported in chapter I4 (APP-387) of the Environmental Statement. Thus, the conclusions remain as reported in the DCO application.

Noise and vibration

3.1.11 The proposed changes to the blasting strategy, marine vessel movements and shift patterns (Request for Non-Material Change no. 1, 2 and 3) has been shown not to result in any changes to noise effects and are therefore not considered further.

3.1.12 The proposed changes to working hours and the HGV delivery window (Request for Non-Material Change no. 4 and 5) have implications to both the project wide and WNDA Development assessments of noise effects. As such, there is potential for intra-project additive cumulative effects due to increased evening and night-time noise levels from sources within the Wylfa Newydd Development Area and from road traffic associated with the Project.

3.1.13 Considering both 2020 (representative of early construction) and 2023 (representative of peak construction), the proposed change to the HGV delivery window (Request for Non-Material Change no. 5) was found to potentially result in adverse effects at an additional 18 residential properties compared to the DCO application and in the absence of mitigation. These effects are predicted to occur at Cefn Coch, Kingsland, Llanfaethlu,

Llangynghenedl as well as outlying receptors at Llanfaethlu and Llanfachraeth.

3.1.14 The proposed change to working hours was also found to potentially result in a small number of additional significant effects at residential receptors located predominately over 1km from the Wylfa Newydd Development Area. A large number of residential receptors assessed as major significance in the DCO application would benefit from the proposed change to working hours; these are located in Cemaes.

3.1.15 There is very little overlap in the residential properties affected by the proposed change to the HGV delivery window and working hours. This is principally because these two non-material change requests relate to aspects of the project that are spatially segregated. Noise effects are local in scale; most noise assessment methodologies in the UK only consider receptors within 600m of the development scheme. Therefore, at most noise sensitive receptors, the physical distance of the proposed changes will prevent cumulative noise effects from one group at the other group. However, there is potential for some properties which are both adjacent to the Main Site and also adjacent to the A5025, and at which cumulative adverse effects could occur.

3.1.16 With consideration of the enhanced mitigation outlined in paragraph 1.3.3, the proposed changes to working hours and the HGV delivery window are not considered to result in any new intra-project effects with respect to increased noise levels from the effects of traffic and elevated noise levels during construction. Thus, the intra-project cumulative effects for this topic remain as reported in chapter I4 (APP-387) of the Environmental Statement.

Terrestrial and freshwater ecology

3.1.17 The only potential effects considered of minor or greater significance relate to the WNDA Development. As shown in section 2.3, the proposed changes to the blasting strategy, marine vessel movements and working hours (Request for Non-Material Change no. 1, 2 and 4) have no effect on this assessment and therefore there are no changes to the intra-project cumulative effects reported in chapter I4 (APP-387) of the Environmental Statement.

The marine environment

3.1.18 The only potential effects to the marine environment as a result of the proposed change to marine vessel movements and working hours (Request for Non-Material Change no. 2 and 4) relate to the WNDA Development (see section 2.3); hence, there are no intra-project cumulative effects to report for this topic.

4 Inter-project cumulative effects

4.1.1 An inter-project cumulative assessment has been undertaken for those topic assessments outlined in the Environmental Statement which are potentially affected by at least two of the non-material changes being sought in relation to the DCO application. These include:

- public access and recreation which is potentially affected by the proposed change to worker shift patterns and the HGV delivery window (Request for Non-Material Change no. 3 and 5);
- air quality which is potentially affected by the proposed change to marine vessel movements and working hours (Request for Non-Material Change no. 2 and 4); and
- noise and vibration which is potentially affected by the proposed change to working hours and the HGV delivery window (Request for Non-Material Change no. 4 and 5).

4.1.2 For these topics, all other requests for non-material change have been scoped out as requiring further consideration within the inter-project cumulative assessment as they have either no pathway for effect or their effect is negligible.

4.1.3 For the traffic and transport assessment, projects considered to have cumulative effects have been included in the traffic model for the Project and therefore form part of the assessment of effects that is represented in volume C of the Environmental Statement and considered in section 2.2 of this appendix.

4.1.4 The methodology used for the cumulative effects assessment has considered all residual effects that are minor adverse or greater.

4.1.5 The list of Reasonably Foreseeable Future Projects (RFFPs) which have been considered within the inter-project cumulative assessment is shown in appendix I2-2 (Matrix of receptors affected by the Wylfa Newydd Project and which short-listed projects could affect them) (APP-390). There is no requirement to scope in any additional RFFPs as a consequence of the proposed changes.

4.1.6 Considering the physical distance of the proposed changes; both the beneficial and adverse effects associated with these; and the new and enhanced mitigation proposed to address adverse effects associated with the Project, all five non-material changes requests even when combined are not considered to alter the inter-project cumulative assessment presented in chapter I5 (APP-388) and associated appendices in the Environmental Statement. Thus, the conclusions remain as reported in the DCO application.

5 Health impacts

5.1.1 The Health Impact Assessment (HIA) Report (APP-429) could potentially be affected by the proposed changes to the blasting strategy, worker shift patterns, working hours and HGV delivery (Request for Non-Material Change no. 1, 3, 4 and 5). The proposed change to the marine vessel movements (Request for Non-Material Change no. 2) will have no impact on human health.

5.1.2 The general influences relevant to population health that arise from the proposed changes are summarised in Table 5-1. The table shows the potential effects against the relevant geographical population groups as used in the Health Impact Assessment Report (APP-429).

5.1.3 The effects are summarised as follows:

- For the population near the Wylfa Newydd Development Area the proposed change to the blasting strategy and workings hours (Request for Non-Material Change no. 1 and 4) are the relevant sources of potential cumulative effects.
- For the population near the local road network (A5025, A55, A5 and A487) the proposed change to the HGV delivery window and worker shift patterns are the relevant sources of potential cumulative effects.

5.1.4 The proposed change to marine vessel movements (Request for Non-Material Change no. 2) is not considered to impact the assessment of effects to human health reported in the Health Impact assessment (HIA) Report (APP-429).

5.1.5 In both cases similar potentially vulnerable groups are relevant (children and young people; older people; and people with existing poor health). Where groups overlap, there may be increased vulnerability.

5.1.6 For the population near the Wylfa Newydd Development Area, the proposed changes that affect the same determinant of health relate to noise disturbance in the evening period from both blasting and construction related activities (including general earthworks close to communities). Other changes from the effects discussed in the DCO application HIA table I-2 that combine to influence the health of this population include: increased night-time noise and reduced nitrogen dioxide concentrations.

5.1.7 As appropriate new and enhanced mitigation is proposed (see paragraph 1.3.3), the overall effect for population health, taking account of the range of small residual beneficial and adverse changes across vulnerable groups, is not expected to alter the HIA conclusion that near the Wylfa Newydd Development Area the overall residual population health effect is considered to be up to minor adverse for the general population and up to moderate adverse for relevant vulnerable groups. The largest change relates to the air quality commitments to improved emission standards. Whilst beneficial, the change in this one determinant of health is unlikely to change the overall cumulative score, which takes account of a range of other health determinants.

5.1.8 For the population near the local road network (A5025, A55, A5 and A487), the proposed changes that affect the same determinants of health relate to

more noise disturbance in the evening period from both HGVs and from vehicles associated with worker shift changes. The combination of morning noise due to shift changes (06:00 or 05:30) and evening noise due to HGV movements (19:00 to 23:00) would also reduce the period when Project related transport would not contribute to potential sleep disturbance. Changes to the times at which these two categories of Project vehicle would be using the local road network may also contribute to both beneficial and adverse influences on road safety. Other changes from the effects discussed in the DCO application HIA (table I-2) that combine to influence the health of this population include: reduced night-time noise (there being no night-shifts ending between 03:00 and 04:00); reduced potential for health-trip journey time delays (e.g. to a hospital); and the potential for weekend HGV movements to reduce amenity and discourage physical activity.

5.1.9 As appropriate new and enhanced mitigation is proposed, the overall effect for population health, taking account of the range of small residual beneficial and adverse changes across vulnerable groups, is not expected to alter the HIA conclusion that near the local road network the overall residual population health effect is considered to be negligible for the general population and up to minor adverse for relevant vulnerable groups. Thus, the conclusions remain as reported in the DCO application.

Table 5-1 Health analysis cumulative assessment

	Relevant geographical population groups	
	Population near the Wylfa Newydd Development Area	**Population near the local road network**
Changes to working hours		
Air quality	Less potential for adverse effects from air pollution due to commitment to higher emission standards.	N/A
Lighting	No changes to community identity or sleep disturbance expected.	N/A
Changes to the HGV delivery window		
Air quality	N/A	No change to air quality from redistribution of vehicle times.
Traffic	N/A	More potential for accident risk during the weekend, as more pedestrians and cyclists. Less potential for journey delays as more use of off-peak times.
Changes to worker shift patterns		
Air quality	N/A	No change to air quality from redistribution of vehicle times.
Traffic	N/A	Less potential for accident risk as less overlap with school travel. Less potential for journey delays.
Construction workers	N/A	No change to community interaction with workforce.

6 Shadow Habitats Regulations Assessment

6.1.1 It was identified that the Shadow Habitats Regulations Assessment (APP-050/051) could potentially be affected by the proposed changes to the blasting strategy, marine vessel movements and working hours (Request for Non-Material Change no. 1, 2 and 4).

6.1.2 Assessments of each of these proposed changes concluded no new or different likely significant (alone or in-combination) effects to that reported in the Shadow Habitats Regulations Assessment (APP-050/051). Consequently, there is not considered to be any new or likely significant (alone or in-combination) effects from the three changes being sought in relation to the Project (i.e. blasting strategy, marine vessel movements and working hours, Request for Non-Material Change no. 1, 2 and 4). Thus, the conclusions remain as reported in the DCO application.

7 Schedule of consequential amendments to application documents

Table 7-1 Schedule of consequential amendments to application documents

Application document name	Examination Reference Number	Section of document	Version to be amended	Description of amendment
Environmental Statement chapter I4: Intra-project cumulative effects	APP-387	4.2	1.0	Update to air quality and noise modelling results
Environmental Statement appendix I4-2: Project-wide and WNDA development intra-project air quality assessment	APP-393	5	1.0	Update to air quality modelling results
Environmental statement appendix I4-3: Intra-project cumulative noise effects	APP-394	1.2	1.0	Update to noise modelling results

8 References

Table 8-1 Schedule of references

ID	Reference
RD1	British Standards Institution. 2008. BS 6472-2 Guide to Evaluation of human exposure to vibration in buildings. Blast-induced vibration. London: British Standards Institution.

Appendix 1-2 Further before and after extracts

Figure 3-1 Figure D5-5 as submitted in the DCO application

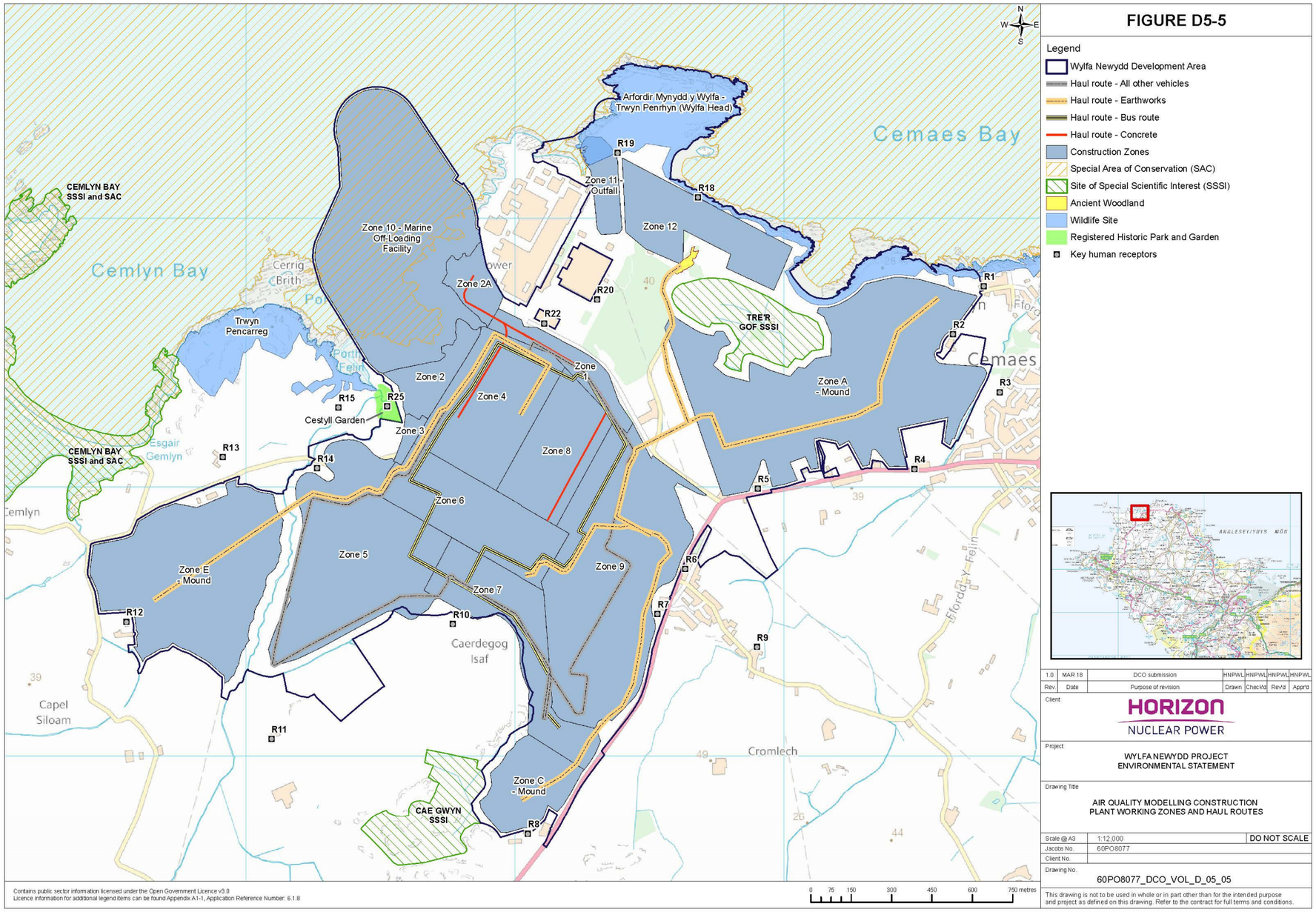

Figure 3-2 Amended figure D5-5 as a result of the proposed change