Cyfoeth Naturiol Cymru
Natural Resources Wales

Ein cyf/Our ref: 20031687
Eich cyf/Your ref: EN010112

Address
Maes Newydd,
Llandarcy,
Neath Port-Talbot
SA10 6JQ

The Planning Inspectorate
Temple Quay House
2 The Square
Bristol
BS1 6PN

8 Mawrth / March 2023

Er sylw / For the attention of: Jake Stephens

Annwyl / Dear Jake,

FFERM WYNT ALLTRAETH AWEL Y MÔR ARFAETHEDIG / PROPOSED AWEL Y MOR OFFSHORE WINDFARM

CYFEIRNOD YR AROLYGIAETH GYNLLUNIO / PLANNING INSPECTORATE REFERENCE: EN010112

EIN CYFEIRNOD / OUR REFERENCE: 20031687

RE: NATURAL RESOURCES WALES' WRITTEN SUBMISSION FOR DEADLINE 7

Thank you for your Rule 8 letter, dated 27th September 2022, requesting Cyfoeth Naturiol Cymru / Natural Resources Wales' (NRW) comments regarding the above.

This letter comprises NRW's Deadline 7 submission (see Annex A of this letter) which provides our responses to the Examining Authority's Third of Round of Questions, as issued on 1st March 2023 and unless otherwise stated are made on behalf of NRW in its advisory capacity as statutory consultee for the DCO application.

Please do not hesitate to contact Nia Phillips ([redacted]@cyfoethnaturiolcymru.gov.uk) and Bryn Griffiths ([redacted]@cyfoethnaturiolcymru.gov.uk) should you require further advice or information regarding these representations.

Yn gywir / Yours sincerely,

[redacted]

Andrea Winterton
Marine Services Manager
Natural Resources Wales

Enc:
Seascape and Visual Sensitivity to Offshore Windfarms in Wales: Stage 1 Report
Seascape and Visual Sensitivity to Offshore Windfarms in Wales: Stage 2 Report
Seascape and Visual Sensitivity to Offshore Windfarms in Wales: Stage 3 Report

ANNEX A

ExQ3	Question to:	Question	NRW Response
0. General and Cross Topic Questions			
0.1	NRW	**Marine Licence** The Applicant's update on the Marine Licence Submission and Progress submitted at Deadline 4 [REP4-025] states that a public consultation took place during December 2022 and January 2023 concerning information submitted to the Marine Licensing Team of NRW on 25 November 2022. Please provide a summary of any relevant results of this public consultation.	NRW Permitting Service (PS) Following receipt of further information provided to the Marine Licensing Team on the 25th of November a consultation ran for 42 days commencing in December and closing in January with expert organisations as well as the public. We received responses from the following organisations: • Department for Business, Energy and Industrial Strategy (BEIS) • Royal Commission on the Ancient and Historic Monument of Wales • National Air Traffic Services • Crown Estate • Welsh Archaeological Trust • Port of Mostyn • Cefas • NRW Advisory • Trinity House • Maritime and Coastguard Agency (MCA) • Ministry of Defence • Natural England • Joint Nature Conservation Committee (JNCC) • Cadw No responses were received from the public. These responses can be shared with the ExA upon request.
0.3	Applicant, NRW	**Pre-commencement works - Offshore** The definition of commencement works in Article 2 of the dDCO [REP6-005], [REP6-006] does not include certain onshore works relating to	The standard definition for "commencement" generally used in Marine Licences issued by NRW is '*the first undertaking of any Licensed Activities'.* 'Licensed Activities' are defined within the Marine Licence. Pre-commencement conditions

		surveying or investigatory works. Please confirm how pre-commencement works (if they exist) are dealt with in the Marine Licence.	can be secured in the marine licence and can relate to either all licensed activities or can be specified so as to only relate to certain Licensed Activities.
2. Biodiversity, Ecology and Natural Environment			
2.1	NRW, JNCC, RSPB, NWWT	**General** Please advise if you have any issues with the Applicant's Response to R17Q1.1 [REP4-008] and the provided template plans, and if issues exist, please reference with explanation and evidence to justify.	Broadly, we are satisfied with the Applicants response to R17Qu1.1 [REP4-008] and with the template plans. This approach is typically industry standard and the content of which can be completed post-DCO-consent. NRW (A) will work closely with the Applicant to develop the plans post-consent. NRW PS may require further detail to be produced in respect of the plans prior to any grant of marine licence. However, we provide the following advice with respect to the template plans which are relevant to marine ornithology. These comments are based on seeking to improve the template plans, as currently drafted, in order to ensure that the final plans are adequate and reliable. Note that NRW(A) expect to be consulted by NRW PS in respect of these plans during the Marine Licence determination and the advice below may be reviewed in light of further evidence. ***Vessel Traffic Management Plan (VTMP)*:** Rather than present information for a single port, NRW (A)'s preference is for the Applicant to highlight all available options for the different ports that could be used for construction, operation and maintenance, so that we can fully consider the ornithological impact of each port option. The list of port options should be agreed with the NRW (A). At this stage, it may be more appropriate for the Applicant to rename section 2.7.3 of the template VTMP to "*Proposed options for base port"* or something similar. It will also be necessary to consider route optioneering, the number and timings (spatial and temporal timings) of vessel transits - all of which should be discussed and agreed in consultation with NRW. Section 2.7.6 could be renamed to "*Proposed options for transit route corridors and timings"* or something similar. ***Project Environmental Management Plan (PEMP)*:** NRW (A) request clarity if the PEMP will be used to outline the validation monitoring for Red Throated Diver, which the Applicant has agreed to further consider, in further consultation

			with NRW [for example, see condition number 34 of REP6-013]. If so, then we advise the outline PEMP should clearly capture this commitment. NRW (A) have advised throughout the examination that comprehensive validation monitoring before, during, and after construction is needed to validate the conclusions of the Applicants assessment with respect to RTD [REP1-080]. We have further advised that this should use aerial surveys to analyse RTD distribution pre-, during- and post-construction. We recommend that the Applicant produces a monitoring plan for this validation work. The monitoring plan should be agreed in writing with NRW.
2.4	NRW, DCC	**Onshore – Mitigation** With reference to Applicant's Response to ISH3 Action Points [REP4-003] please could you confirm if you have any issues with pre-commencement works being able to take place in accordance with outline management plans such as the oLEMP [REP4-011], oCoCP [REP5-016], and outline drainage strategy as certified.	We note this question has been directed to both DCC and NRW. NRW (A) have no issues to raise and no comments to make.
2.11	NRW	**Offshore – Ornithology** Please could you confirm that you are satisfied with the use of generic parameters given in Horswill and Robinson (2015) as site-specific parameters are not readily available.	Yes, NRW (A) are satisfied with this approach.
2.14	Applicant, RSPB, NRW	**HRA** **RSPB** Please could you comment on NRW Advisory Deadline 5 addendum ANNEX A: NRW Advisory's position regarding the implications of the newly published Conservation Objectives for Liverpool Bay SPA on our statutory advice relating to the Awel y Môr offshore windfarm [REP5-039]. **To the Applicant and NRW**	NRW (A) advise that there are no implications arising from the newly published conservation objectives for the Report to Inform Appropriate Assessment and associated annexes. Paragraph 14 of NRW (A)'s addendum to the D5 submission [REP-047] states that "*As such, even in light of the new COs, it remains NRW (A)'s view that the assessment that the Applicant has undertaken for this feature still stands, and that there will be no adverse effect upon it or the site, either alone or in-combination*".

		ANNEX A: NRW Advisory's position regarding the implications of the newly published Conservation Objectives for Liverpool Bay SPA. Please could you advise on any implications for the Report to Inform Appropriate Assessment [APP-027] and associated annexes?	
4. Construction			
4.2	Applicant, NRW, DCC	**Onshore** **To the Applicant** Please could you confirm the impact assessment for noise and air quality (with reference to your response in ExQ2.4.7 [REP5-004] that crushing/sorting may be required in the event that either rock or granular and cohesive material are encountered). Please also clarify if crushing/sorting is deemed a demolition activity, with reference to your previous response ExQ1.4.18 [REP1-007] that you do not intend to undertake demolition activities on site. **To NRW, DCC** Please could you list any permits required for crushing/processing material on site.	Should the Applicant need to crush the material produced on site and use it on the same site then a permit or exemption from NRW PS would not be required for this activity. Material that would arise from this activity would not be classified as waste and would not fall under current waste legislation. Should the Applicant need to bring waste material on site to use or treat then the Applicant should contact NRW PS for further advice. In this instance, NRW PS would require a detailed description of the activities proposed and what material is to be brought on site. There are waste exemptions that may apply, depending on what specific activities would be carried out, what waste material would be used, and in what quantities. Should the activities not meet the exemptions criteria a waste permit from NRW PS may be needed.
4.3	Applicant, NRW	**Onshore** **To the Applicant**: Please could you clarify your approach to waste and materials. The statement that cut material from the site can be utilised as part of the fill material requirements of the earthworks platform, subject to testing and specification requirement in response to ExQ2 4.7 [REP5-004] infers that	We note this question is directed to both the Applicant and NRW. We consider the Applicant best placed to answer this question with respect to their proposals, however we can advise that material produced on site, including excavated rock or granular soil that is then re-used at the same site, is not classified as waste and therefore doesn't fall under current waste legislation. However, if the excavated material would be transported to a different site to be used there, then, as highlighted in Q4.2 above, a waste permit or an exemption may be required and the Applicant (or its appointed contractor(s)) would need to

		it would not be a waste but be managed in such a way that it would be a material. **To the Applicant and NRW:** Please outline the mechanism and approach to the waste legislation framework in regard to the re-use of excavated rock/granular soil and if an outline materials management plan is required.	provide more information to NRW PS about the amount of material, place of origin, place of use, and type of use, for NRW PS to advise on any permitting requirement as part of its regulatory role. Whilst an outline materials management plan is not required for the DCO process, it may be useful for the Applicant to produce one to inform any future permit application (if required).
17. Seascape, Landscape and Visual			
17.1	Applicant, NRW	**Plans** The third row of [REP4-003] provides links to a number of requested documents. Please provide pdf copies of these.	We note that this question is directed to both the Applicant and NRW. We have liaised with the Applicant and confirm that NRW (A) have provided pdf copies of the White Consultants Reports at Deadline 7. We understand the Applicant is submitting pdfs for the other links provided in the third row of [REP4-003].
17.2	Applicant, NRW	**Clwydian Range and Dee Valley AONB Management Plan** [REP4-003] notes that a revised version of the Clwydian Range and Dee Valley AONB Management Plan was adopted in late December 2022. Please: a) provide a pdf copy of this; and b) identify any implications for the SLVIA (and LVIA).	We note that this question is directed to both the Applicant and NRW. We have liaised with the Applicant and understand that they are providing a pdf of the adopted Management Plan at Deadline 7. With respect to part b) of this question, NRW (A) confirms that the revised and adopted Clwydian Range and Dee Valley Area of Outstanding Natural Beauty (AONB) does not alter our advice with respect to this designated landscape (we refer you to our advice at Deadline 1 [REP1-080]).
17.4	NRW, ENPA, IoACC	**Climate Change** The Applicant makes reference (including in paragraphs 3.36 and 3.61 of [REP5-007]), to predicted widespread adverse changes to landscapes, including those within the AONBs and the SNP (now ENP), as a result of unchecked climate change. It goes on to suggest that the Proposed Development's mitigation of climate change impacts would thus play a part in conserving these landscapes. Do	The proposed development would play a part in the general mitigation of climate change impacts more widely. However, we consider that it is an overstatement to state that the development would specifically help to conserve aspects of the Eryri National Park and the Isle of Anglesey AONB directly as all different types of renewable energy across Wales, and other methods of combating climate change, would all play their part nationally and make some contribution to combating climate change. It is not possible, in our view, to measure whether a particular renewable energy scheme benefits a specific landscape in reducing the impacts of climate change,

		the parties share this view, and if not, please provide reasons?	the theories and predictions relate to the wider issue and cannot be correlated in this way.

---------- END----------

Cyfoeth Naturiol Cymru
Natural Resources Wales

Seascape and visual sensitivity to offshore wind farms in Wales:

Strategic assessment and guidance

Stage 1- Ready reckoner of visual effects related to turbine size

Simon White, Simon Michaels and Helen King, White Consultants

Report No 315

www.naturalresourceswales.gov.uk

About Natural Resources Wales

Natural Resources Wales' purpose is to pursue sustainable management of natural resources. This means looking after air, land, water, wildlife, plants and soil to improve Wales' well-being, and provide a better future for everyone.

Evidence at Natural Resources Wales

Natural Resources Wales is an evidence based organisation. We seek to ensure that our strategy, decisions, operations and advice to Welsh Government and others are underpinned by sound and quality-assured evidence. We recognise that it is critically important to have a good understanding of our changing environment.

We will realise this vision by:

- Maintaining and developing the technical specialist skills of our staff;
- Securing our data and information;
- Having a well resourced proactive programme of evidence work;
- Continuing to review and add to our evidence to ensure it is fit for the challenges facing us; and
- Communicating our evidence in an open and transparent way.

This Evidence Report series serves as a record of work carried out or commissioned by Natural Resources Wales. It also helps us to share and promote use of our evidence by others and develop future collaborations. However, the views and recommendations presented in this report are not necessarily those of NRW and should, therefore, not be attributed to NRW.

Report series:	NRW Evidence Series
Report number:	315
Publication date:	March 2019
Contract number:	N/A
Contractor:	White Consultants: Environment Ltd in association with Northumbria University
Contract Manager:	L. Skates
Title:	**Seascape and visual sensitivity to offshore wind farms in Wales: Strategic assessment and guidance. Stage 1- Ready reckoner of visual effects related to turbine size**
Author(s):	**White, S. Michaels, S. King, H**.
Restrictions:	None

Distribution List (core)

NRW Library, Bangor	2
National Library of Wales	1
British Library	1
Welsh Government Library	1
Scottish Natural Heritage Library	1
Natural England Library (Electronic Only)	1

Distribution List (others)

Will be circulated to relevant parties electronically

Recommended citation for this volume:

White, S. Michaels, S. King, H. 2019. Seascape and visual sensitivity to offshore wind farms in Wales: Strategic assessment and guidance. Stage 1- Ready reckoner of visual effects related to turbine size. NRW Evidence Series. Report No: 315, 94pp, NRW, Bangor.

Contents

List of Figures

List of Tables

1. Crynodeb Gweithredol

1.1. Cefndir

Ym mis Tachwedd 2018, penodwyd White Consultants gan Gyfoeth Naturiol Cymru (CNC) i gynnal asesiad strategol a pharatoi canllawiau ar gyfer sensitifrwydd morwedd a gweledol i ffermydd gwynt ar y môr yn ardal cynllun morol Cymru.

Ym mis Tachwedd 2018, penodwyd White Consultants gan Gyfoeth Naturiol Cymru (CNC) i gynnal asesiad strategol a pharatoi canllawiau ar gyfer sensitifrwydd morwedd a gweledol i ffermydd gwynt ar y môr yn ardaloedd Cynllun Morol drafft Cymru.

Mae i'r prosiect dair rhan ac, er cyflawnrwydd, dylid ystyried y rhain gyda'i gilydd. Yr adroddiad hwn yw'r rhan gyntaf ac mae'n gyfrifydd parod o effeithiau gweledol sy'n dangos y pellterau argymelledig oddi wrth Barciau Cenedlaethol ac Ardaloedd o Harddwch Naturiol Eithriadol (AHNEoedd) mewn perthynas â thyrbinau o wahanol uchderau hyd at 350m at flaen y llafn. Mae Polisi Cynllunio Cymru (PCC10) yn datgan y dylid rhoi pwys mawr ar ddibenion statudol Parciau Cenedlaethol ac AHNEoedd, yn cynnwys gwarchod a gwella'u harddwch naturiol a'u nodweddion arbennig. Mae hyn yn berthnasol i'r gweithgareddau sydd y tu mewn i'r ardal ddynodedig, neu yn y lleoliad.

1.2. Dull Gweithredu

I bob pwrpas, mae'r briff yn gofyn i'r astudiaeth ymchwilio a mapio'r byfferau ar gyfer tyrbinau o wahanol uchderau sydd eu hangen er mwyn osgoi effeithiau andwyol sylweddol ar dderbynyddion gweledol arfordirol sensitif iawn. Fodd bynnag, mae arwyddocâd effaith mewn Asesiadau o Effeithiau Morwedd a Gweledol (AEMGau) yn ddyfarniad a fydd yn amrywio yn dibynnu ar nifer o newidynnau a meini prawf. Felly mae'r adroddiad hwn yn mabwysiadu'r ymagwedd mai maint y newid ar dderbynyddion gweledol mewn AEMGau yw'r penderfynydd mwyaf cyson o ran yr effeithiau tebygol a achosir gan ffermydd gwynt ar y môr.

Yr amrediadau a ystyriwyd at ddibenion y briff yw effeithiau o feintiau isel a chanolig. Ar y cyd â derbynnydd sensitif iawn, mae effaith o faint isel yn debygol o arwain i effaith o bwysigrwydd 'cymedrol'. Mae effaith o faint canolig yn debygol o arwain i effaith o bwysigrwydd 'mawr-cymedrol'. Mae ymchwil a chanllawiau'n dangos bod effaith cymedrol yn gallu bod yn effaith sylweddol, a bod mawr-cymedrol yn cael ei ddosbarthu fel effaith sylweddol yn y mwyafrif llethol o AEMGau.

Mae AEMGau ar 23 o ffermydd gwynt ar y môr cymwys wedi cael eu dadansoddi yn nyfroedd Cymru, Lloegr a'r Alban. Mae'r pellter cyfartalog a mwyaf ar gyfer effaith o faint isel a chanolig wedi cael eu cofnodi. Mae'r effeithiau cronnus wedi cael eu nodi hefyd a'u defnyddio lle mae fferm wynt yn estyniad i aráe fawr bresennol.

Mae'r dadansoddiad o AEMGau yn ystyried effeithiau tyrbinau sydd hyd at 300m o uchder yn unig oherwydd y nifer gyfyngedig o AEMGau cymwys oedd ar gael yn ystod y cyfnod ymchwil. Felly mae dadansoddiad ffrâm wifren wedi cael ei gynnal ar gyfer tyrbinau 350m o uchder.

Mae'r senarios fframiau gwifren yn dangos arâe o dyrbinau gwynt 350m o uchder wedi'u cyfosod ag araeau o dyrbinau 145m a 225m lle mae pob un yn ymddangos fel pe baent o'r un uchder. Mewn theori, byddai hyn yn golygu y byddai'r tyrbinau 350m o uchder ar y pellter a gyfrifwyd yn cael effaith weledol debyg, i bob pwrpas, er gwaethaf y ffactorau cyfnewidiol sy'n effeithio ar weledded dros bellter, fel tawch.

1.3. Casgliadau

Mae casgliadau cyfunol yr AEMG a'r dadansoddiad ffrâm wifren fel a ganlyn ac yn cael eu dangos yn **Nhabl 1 a Diagramau 2 a 3 isod, a Ffigurau 3 a 4:**

Tabl 1 Crynodeb o gasgliadau'r dadansoddiad AEMG

Amrediad o uchderau tyrbinau at flaen y llafn (m)	Effaith o faint isel		Effaith o faint canolig	
	Pellter Cyfartalog km	Pellter Mwyaf km	Pellter Cyfartalog km	Pellter Mwyaf km
107-145	22.6	27.3	14.0	15.0
146-175	24.4	26.5	18.8	20.8
176-225	28.5	32.0	22.0	26.7
226- 300	41.6	52.7	27.9	31.4
301-350	44.0	-	32.8	-

Diagram 2: Pellterau lle mae effaith weledol o faint isel gyfartalog yn digwydd ar gyfer tyrbinau o wahanol uchderau

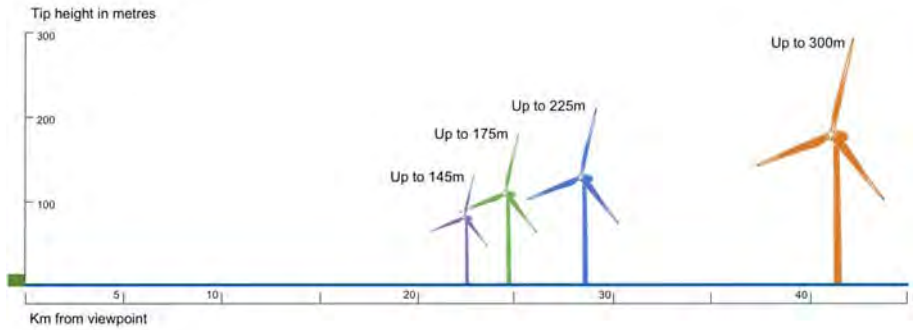
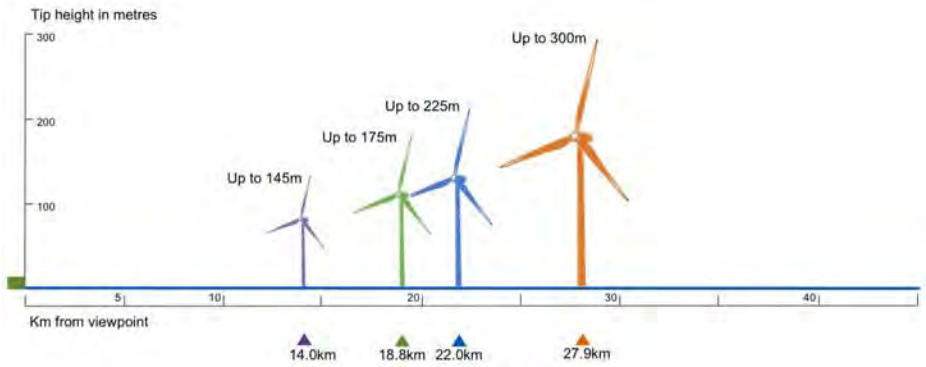


Diagram 3: Pellterau lle mae effaith weledol o faint canolig gyfartalog yn digwydd ar gyfer tyrbinau o wahanol uchderau



Y gymhareb fras iawn rhwng uchder a phellter tyrbinau o ran effaith o faint isel cyfartalog yw 1:133 a 1:100 o ran effaith o faint canolig cyfartalog.

Mae'n rhaid ystyried y pellterau hyn yn ofalus am y rhesymau canlynol:

- Barn aseswyr yw AEMGau, ac nid barn adolygwyr awdurdodau statudol neu drydydd partïon.
- Mae cymryd cyfartaledd o'r effeithiau o faint isel a chanolig yn golygu nad yw'r achos gwaethaf yn cael ei ystyried. Felly mae yna botensial ar gyfer effeithiau sylweddol ar y pellterau hyn.
- Mae pellterau byfferau o faint canolig yn arwydd bod tebygrwydd o effeithiau sylweddol ar dderbynnydd sensitif iawn o ran maint tyrbinau gwynt ar y pellter penodedig, neu lai. Mae potensial ar gyfer effeithiau sylweddol y tu hwnt i'r pellter hwn hefyd.
- Mae pellterau byfferau o faint isel yn arwydd bod tebygrwydd nad oes unrhyw effeithiau sylweddol ar dderbynnydd sensitif iawn o ran maint tyrbinau gwynt ar y pellter penodedig, neu y tu hwnt iddo. Fodd bynnag, mae'n debygol y bydd rhai effeithiau y tu hwnt i'r pellter hwn. Nid yw'r effeithiau hyn yn rhai dibwys.

1.4. Adolygiad o archwiliadau ac ymholiadau

Mae nifer o archwiliadau ac ymholiadau wedi cael eu hymchwilio mewn perthynas â ffermydd gwynt ar y môr sy'n rhyngweladwy naill ai â Pharciau Cenedlaethol neu AHNEoedd. Dyma'r casgliadau:

- Mae'n amlwg bod Awdurdodau Archwilio ac Arolygwyr o'r farn bod pob achos yn cael ei ystyried yn ôl ei deilyngdod.
- Mae paneli Awdurdodau Archwilio ac Arolygwyr yn cydnabod bod effeithiau o faint canolig sy'n arwain i effeithiau sylweddol mawr/cymedrol yn rhai sylweddol.
- Mae'r ffactorau yr ystyriwyd eu bod yn lleihau niwed gan yr Arolygwyr neu'r Awdurdodau Archwilio yn cynnwys bod y ffermydd gwynt yn weladwy yn anaml iawn o'r ardaloedd dynodedig, p'un ai'r tir yw ffocws pennaf yr ardal ddynodedig, a lle mae datblygiadau sylweddol fel pwerdai neu ardaloedd trefol wedi'u lleoli ar yr arfordir neu ar y môr, er enghraifft ffermydd gwynt ar y môr presennol.
- Mae'r ffactorau yr ystyriwyd eu bod yn cynyddu niwed yn cynnwys lle mae gan yr ardaloedd dynodedig yr effeithir arnynt nodweddion arbennig sy'n gysylltiedig â'r arfordir a'r môr, lle mae ffermydd gwynt yn cael eu cynnig yn agos iawn at arfordir yr ardaloedd dynodedig hyn, lle yr effeithir ar amryfal ardaloedd dynodedig, a lle mae ffactorau eraill fel tyrbinau sy'n gorgyffwrdd yn weledol (hyd yn oed â meintiau llai) yn amlwg.

1.5. Crynodeb

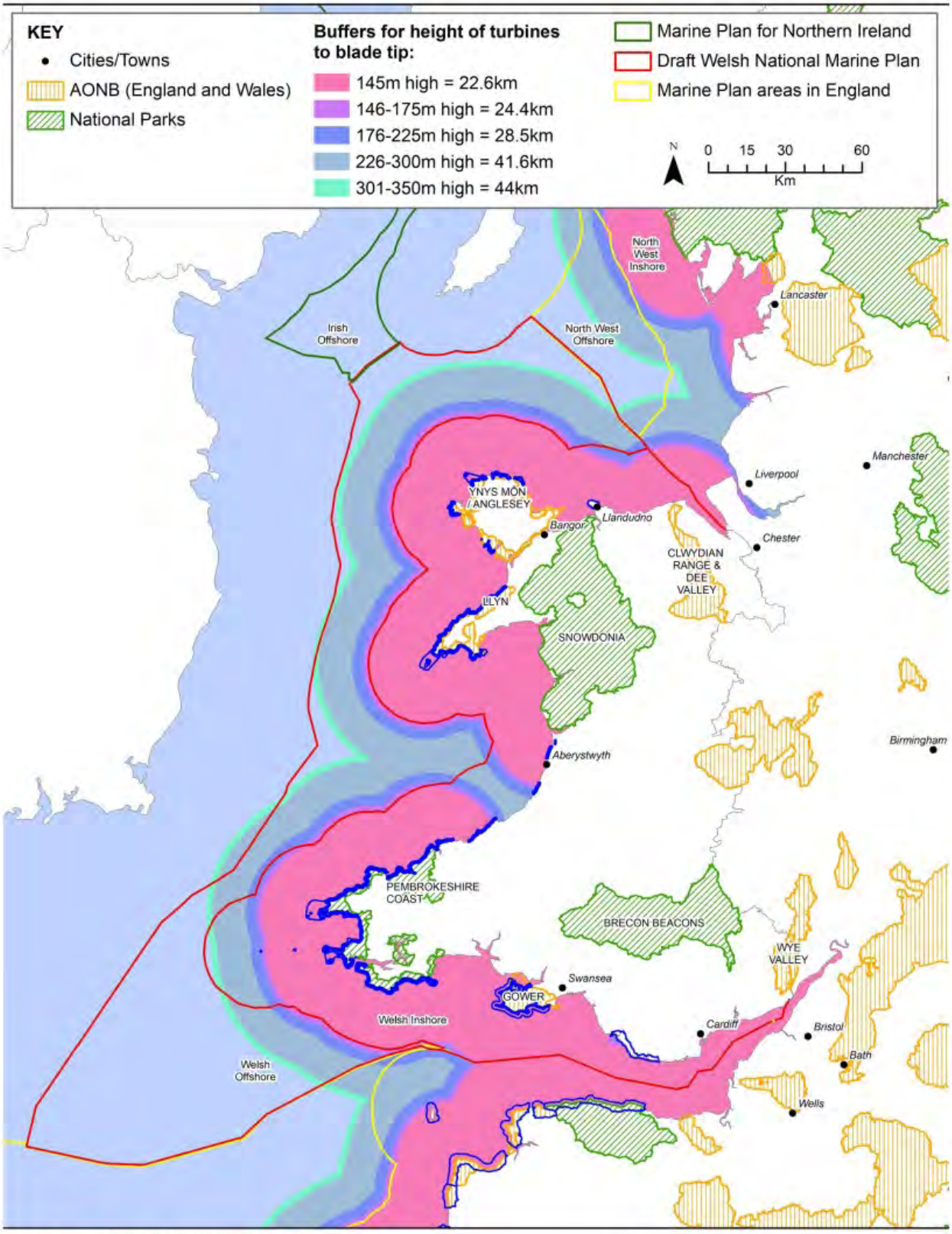
I grynhoi:

- Mae'r ymchwil hwn yn dangos perthynas rhwng uchder tyrbinau gwynt ar y môr a'r radd o effeithiau gweledol.
- Caiff hyn ei fesur yn nhermau maint yr effeithiau gweledol, a phan gaiff y rhain eu cyfuno â derbynnydd gweledol sensitif iawn, maent yn dangos y pellterau lle mae effeithiau gweledol sylweddol yn debygol.

- Mae'r pellterau sy'n cynrychioli'r radd o effaith weledol o feintiau isel a chanolig yn adlewyrchu i ba raddau bydd yr effeithiau gweledol sylweddol 'posibl' a 'thebygol' ar dderbynyddion sensitif yn digwydd.
- Mae'r amrediad o bellterau ag effaith o faint isel yn fwy priodol i'w defnyddio fel ymagwedd ragofalus er mwyn osgoi effeithiau andwyol sylweddol.
- Y gymhareb fras iawn rhwng uchder a phellter tyrbinau o ran effaith o faint isel yw 1:133 ac 1:100 o ran effaith o faint canolig (felly bydd aráe o dyrbinau 200m o uchder yn debygol o gael effaith weledol sylweddol hyd at bellter o 20km).
- Gan yr ystyrir mai'r crynhoad yw'r mwyaf cynhwysfawr hyd yma ar y pwnc penodol hwn, mae'n darparu sail resymol ar gyfer trafodaethau ynglŷn â'r radd o effeithiau gweledol sylweddol tebygol.
- Mae hyn ar sail y ffaith fod:
    - Y crynhoad o dystiolaeth yn ymwneud â chynlluniau tyrbinau gwynt ar y môr blaenorol yn y Deyrnas Unedig, mewn araeau mawr, ar wahanol uchderau a phellterau i ffwrdd.
    - Mae'r derbynyddion gweledol sensitif a ddefnyddir i ddiffinio byfferau yng Nghymru yn dirweddau dynodedig (Parciau Cenedlaethol ac AHNEoedd).
    - Mae'r dystiolaeth ar ffurf nifer o wahanol ddyfarniadau proffesiynol a ddefnyddiwyd mewn asesiadau o effeithiau morwedd a gweledol (AEMGau) a/neu mewn Ymchwiliad Cyhoeddus.
    - Mae dyfarniadau'r AEMGau yn seiliedig ar fwy o ffactorau nag uchder tyrbinau a'u pellter i ffwrdd yn unig – ond er gwaethaf hyn, mae'r crynhoad yn dangos patrwm.
- Gan y gall manylion penodol pob datblygiad a phob derbynnydd gweledol sensitif amrywio, ni ddylid defnyddio'r crynhoad hwn i rwystro trafodaeth bellach ar sail pob cynllun unigol yn ei dro.

Dylid rhoi ystyriaeth i'r canlynol:

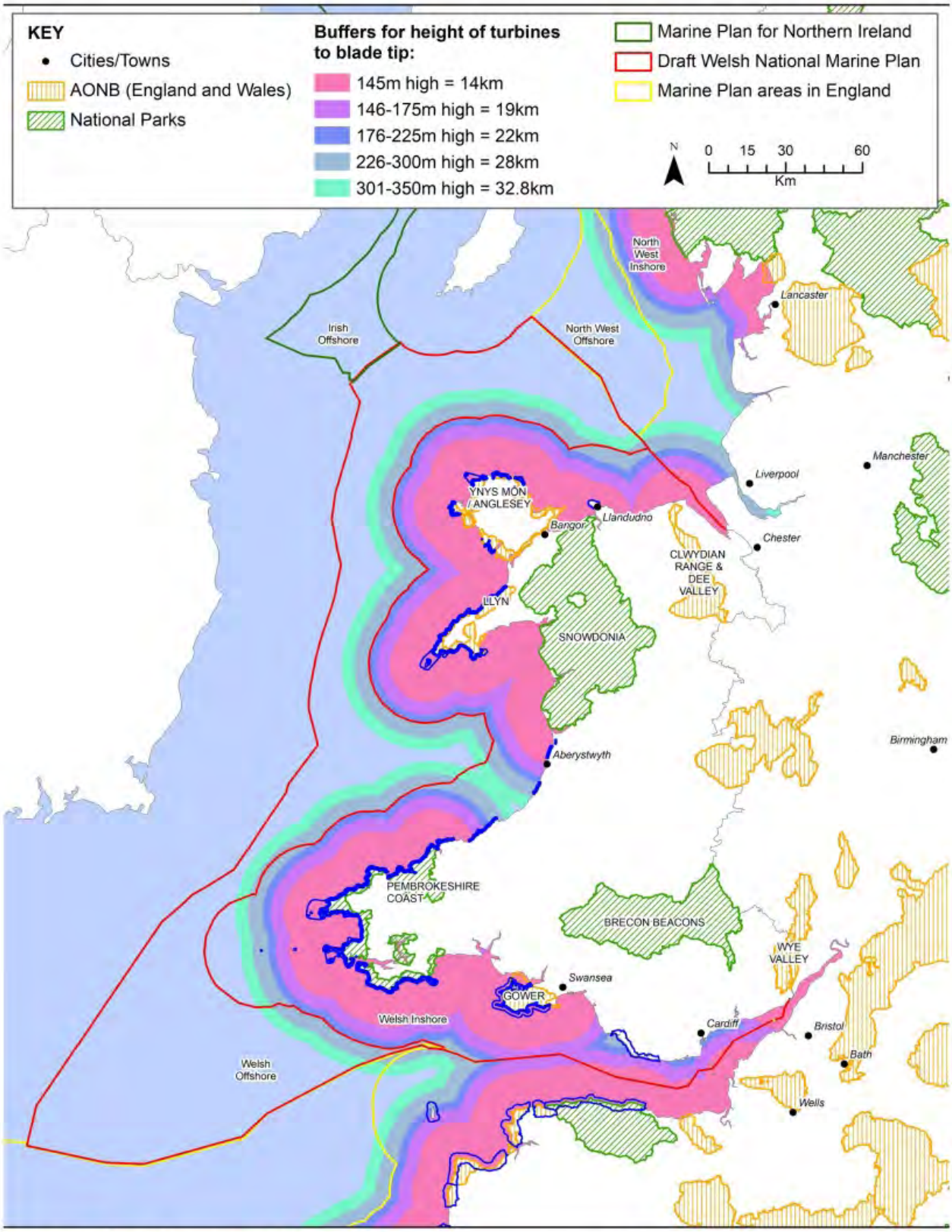
- Ni ellir trin yr holl AHNEoedd a Pharciau Cenedlaethol yn yr un ffordd – mae eu nodweddion arbennig yn bwysig er mwyn medru deall eu perthynas â'r arfordir a'r môr cyfagos.
- Gall tyrbinau bach gael llawn cymaint o effaith â thyrbinau mawr yn dibynnu ar ffactorau eraill fel gradd a threfniant. Felly, dylid trin yr amrediad effaith o faint canolig ar gyfer tyrbinau hyd at 175m o uchder â phwyll oherwydd, mewn rhai achosion, gall yr effeithiau fod yn fwy sylweddol.
- Nid yw effeithiau o faint isel hyd yn oed yn golygu nad yw datblygiad yn weladwy. Gallai hyn fod yn amhriodol yn y safleoedd mwyaf sensitif lle mae ffermydd gwynt ar y môr yn sefyll yn union o flaen dynodiadau ac yn weladwy o lawer o safbwyntiau a hefyd yn agos at y penrhynion a'r ynysoedd gorllewinol. Yn y safleoedd mwy sensitif, efallai mai'r ymagwedd ddewisol fyddai osgoi rhyngweledd ac unrhyw effeithiau gweledol andwyol sy'n uwch na dibwys.
- Dylid ystyried byfferau gweledol ar uchder tyrbinau fel rhan yn unig o effeithiau morwedd a gweledol. Mae ffactorau eraill yn cael eu harchwilio yn yr adroddiadau Cam 2 a 3.



www.whiteconsultants.co.uk

Figure 3
Buffers to National Parks and AONBs: Low magnitude of effect

28/03/19 | v6 | Drawn: HK | Checked SW



www.whiteconsultants.co.uk

Figure 4
Buffers to National Parks and AONBs: Medium magnitude of effect

28/03/19 | v5 | Drawn: HK | Checked SW

2. Executive Summary

2.1. Background

Natural Resources Wales (NRW) appointed White Consultants in November 2018 to undertake a strategic assessment and prepare guidance for seascape and visual sensitivity to offshore wind farms in Wales' marine plan area.

Natural Resources Wales (NRW) appointed White Consultants in November 2018 to undertake a strategic assessment and prepare guidance for seascape and visual sensitivity to offshore wind farms in Wales' draft Marine Plan areas.

The project is in three parts which for completeness should be considered together. This report is the first part and is a visual effects ready reckoner showing the recommended distances from National Parks and Areas of Outstanding Natural Beauty (AONBs) in relation to different turbine heights up to 350m to blade tip. Planning Policy Wales (PPW10) states that great weight should be given to the statutory purposes of National Parks and AONBs including conserving and enhancing their natural beauty and their special qualities. This applies to both activities that lie within, or in the setting, of the designated area.

2.2. Approach

The brief effectively requires the study to research and map buffers for different heights of turbines required to avoid significant adverse effects on high sensitivity coastal visual receptors. However, the significance of effect in Seascape and Visual Impact Assessments (SVIAs) is a judgement that will vary depending on a number of variables and criteria. Therefore this report takes the approach of using magnitude of change on visual receptors in SVIAs as the most consistent determinant of likely effects of offshore windfarms.

The ranges considered for the purposes of the brief are low and medium magnitudes of effect. Combined with a high sensitivity receptor, a low magnitude of effect is likely to result in an effect of 'moderate' significance. A medium magnitude of effect is likely to result in an effect of 'major-moderate' significance. Research and guidance indicate that a moderate effect can potentially be significant, and that major-moderate is classified as significant in the vast majority of SVIAs.

The SVIAs of 23 suitable offshore wind farms have been analysed in England, Wales and Scotland's waters. Both the average and maximum distance for low and medium magnitude of effect have been recorded. Cumulative effects have also been noted and used where a windfarm is an extension to an existing large array.

The SVIA analysis only considers the effects of turbines up to 300m high due to the limited number of suitable SVIAs available during the research period. Therefore a wireframe analysis for 350m high turbines has been carried out.

The wireframe scenarios show an array of 350m high wind turbines in juxtaposition with arrays of 145m and 225m turbines where they all appear the same height. In theory, this would mean that the 350m high turbines at the located distance would

potentially have a similar visual effect notwithstanding variable factors that affect visibility over distance such as haze

2.3. Findings

The combined findings of the SVIA and wireframe analysis are as follows and are shown in **the Table 1 and Diagrams 2 and 3 below and Figures 3 and 4:**

Table 1 Summary of SVIA analysis findings

Range of turbine heights to blade tip (m)	Low magnitude of effect		Medium magnitude of effect	
	Average Distance km	Maximum Distance km	Average Distance km	Maximum Distance km
107-145	22.6	27.3	14.0	15.0
146-175	24.4	26.5	18.8	20.8
176-225	28.5	32.0	22.0	26.7
226- 300	41.6	52.7	27.9	31.4
301-350	44.0	-	32.8	-

Diagram 2: Distances at which average low magnitude of visual effect occurs for different heights of turbine

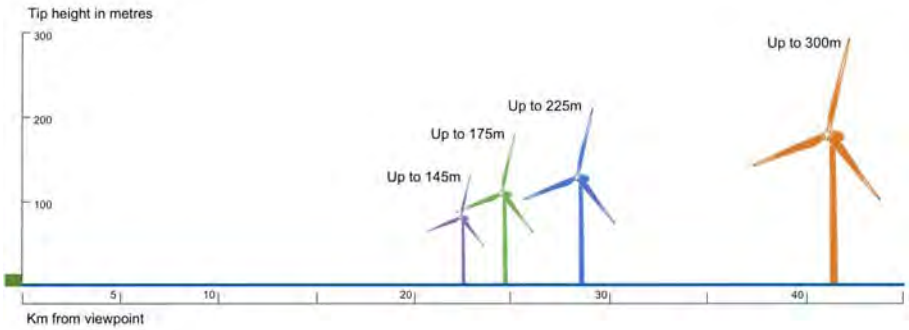
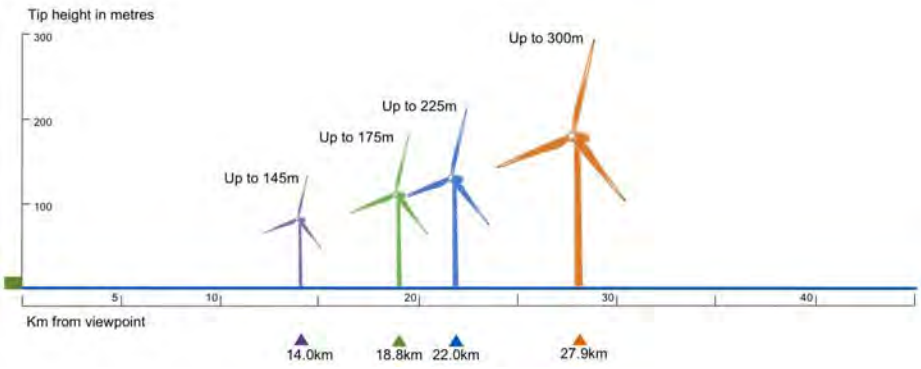


Diagram 3: Distances at which average medium magnitude of visual effect occurs for different heights of turbine



A very approximate ratio between turbine height and distance for an average low magnitude of effect is 1:133 and 1:100 for average medium magnitude of effect.

These distances need to be considered carefully for the following reasons:

- SVIAs are opinion of assessors, not necessarily statutory authority or third party reviewers.

- Taking an average of low and medium magnitude of effects means that the worst case is not taken. There is therefore potential for significant effects at these distances.
- Medium magnitude buffers are an indication that there is a likelihood of significant effects on a high sensitivity receptor for the size of wind turbine at, or less than, the distance stated. There is also potential for significant effects beyond.
- Low magnitude buffer distances are an indication that there is a likelihood that there are no significant effects on a high sensitivity receptor for the size of wind turbine at, or beyond, the distance stated. However, there are likely to be some effects beyond. The effects are not negligible.

2.4. Review of examinations and inquiries

A number of examinations and inquiries have been researched relating to offshore windfarms which are inter-visible with either National Parks or AONBs. Conclusions are:

- It is clear that Examining Authorities and Inspectors take the view that each case is considered on its own merit.
- Medium magnitude of effects leading to major/moderate significant effects are accepted as significant by Examining Authority panels and Inspectors.
- Factors which have been considered by Inspectors or Examining Authorities to reduce harm include a very limited number of views from designated areas, whether a designated area relates mainly to the land, and where there are significant developments such as power stations or urban areas located on the coast or offshore, such as existing offshore windfarms.
- Factors which have been considered to increase harm include where the designated areas affected have special qualities relating to the coast and sea, where wind farms are proposed directly off the coast of these designated areas, where multiple designated areas are affected and where other factors such as visual overlapping of turbines (even with smaller sizes) are apparent.

2.5. Summary

In summary:

- This research indicates a relationship between the height of offshore wind turbines and the extent of visual effects.
- This is measured in terms of the magnitude of visual effects, which when combined with a high sensitivity visual receptor, indicate distances at which significant visual effects are likely.
- Distances representing the extent of low and medium magnitudes of visual effect reflect the extents of ‘possible’ and ‘probable’ significant visual effects on sensitive receptors occurring.
- The low magnitude of effect range of distances are more appropriate to use as a precautionary approach to avoiding significant adverse effects.
- A very approximate ratio between turbine height and distance for average low magnitude of effect is 1:133 and 1:100 for average medium magnitude of effect (so an array of 200m high turbines is likely to have a significant visual effect up to 20km distance).

- As the digest is understood to be the most comprehensive to date on this specific topic, it provides a reasonable basis for discussions about the extent of likely significant visual effects.
- This is on the basis that:
    - The digest of evidence relates to past cases for UK offshore wind turbines, in large arrays, at different heights and distances away.
    - The sensitive visual receptors used to define buffers in Wales are designated landscapes (National Parks and AONBs).
    - The evidence is in the form of a number of different professional judgements used in seascape and visual impact assessments (SVIAs) and/or at Public Inquiry
    - The SVIA judgements are based on more factors than only turbine height and distance away – but despite this, the digest indicates a pattern.
- As the specifics of each development and each sensitive visual receptor can vary, this digest must not be used to close down further discussion on a case by case basis.

The following should be taken into consideration:

- Not all AONBs and National Parks can be treated the same- their special qualities are important in understanding their relationship to the coast and related sea.
- Smaller turbines can have as large an effect as larger turbines depending on other factors such as extent and arrangement. Therefore, the medium magnitude of effect range for turbines up to 175m high should be treated with caution as in some cases effects may be larger.
- Even low magnitude of effects do not mean that development is not visible. This may not be appropriate in the most sensitive situations where offshore windfarms are directly out to sea from designations and visible from many viewpoints and also off the western peninsulas and islands. In the more sensitive situations avoiding intervisibility and any adverse visual effects above negligible may be the preferred approach.
- Visual buffers based on turbine height should be considered as only part of seascape and visual impact. Other factors are explored in the Stage 2 and 3 reports.

3. Introduction

3.1. Background and the brief

Natural Resources Wales (NRW) appointed White Consultants in November 2018 to undertake a strategic assessment and prepare guidance for seascape and visual sensitivity to offshore wind farms in Wales' marine plan area.

The brief states that the project aims are to:

- To undertake strategic assessment and mapping of areas of visual sensitivity to offshore windfarm development around the coast of Wales, which NRW can use to inform ongoing discussions with the Crown Estate and others, including Welsh Government and developers, about the leasing and consenting of any new areas for offshore wind.
- To prepare a short siting guidance paper in relation to seascape and visual effects of offshore wind farms aimed at an audience of developers, marine planners and NRW staff.

The project is in three parts, of which this report is the first. The parts are:

- A visual effects ready reckoner showing the recommended distances from National Parks and Areas of Outstanding Natural Beauty (AONBs) in relation to different turbine heights.
- A guidance note setting out what offshore windfarm developers need to know in relation to seascape and visual effects at their site search stage.
- A seascape sensitivity assessment for offshore windfarms in Wales' Marine plan area.

These parts are complementary to each other and should be considered together in order to inform the best location for future offshore wind farm locations, in terms of seascape and visual matters.

The brief sets out the following requirement for the ready reckoner study:

- Consider the relationship between distance offshore of wind turbines, and the magnitude of visual effects on sensitive coastal visual receptors.
- Research should draw on any available past research and a review of past offshore wind farm developments including any precedents accepted at public inquiries, in order to demonstrate a reasonable consensus.
- Draw out from the research a pattern or 'ready-reckoner' model showing a distance v height relationship to the magnitude of visual effects.
- Assume that turbine height to tip will range up to 350 metres. Height variation should be reflected in the ready-reckoner model.
- Create a GIS map layer showing the spatial pattern that emerges in Welsh seascapes if the distance versus turbine height ready reckoner model is applied in relation to National Parks and AONBs.

3.2. Report structure

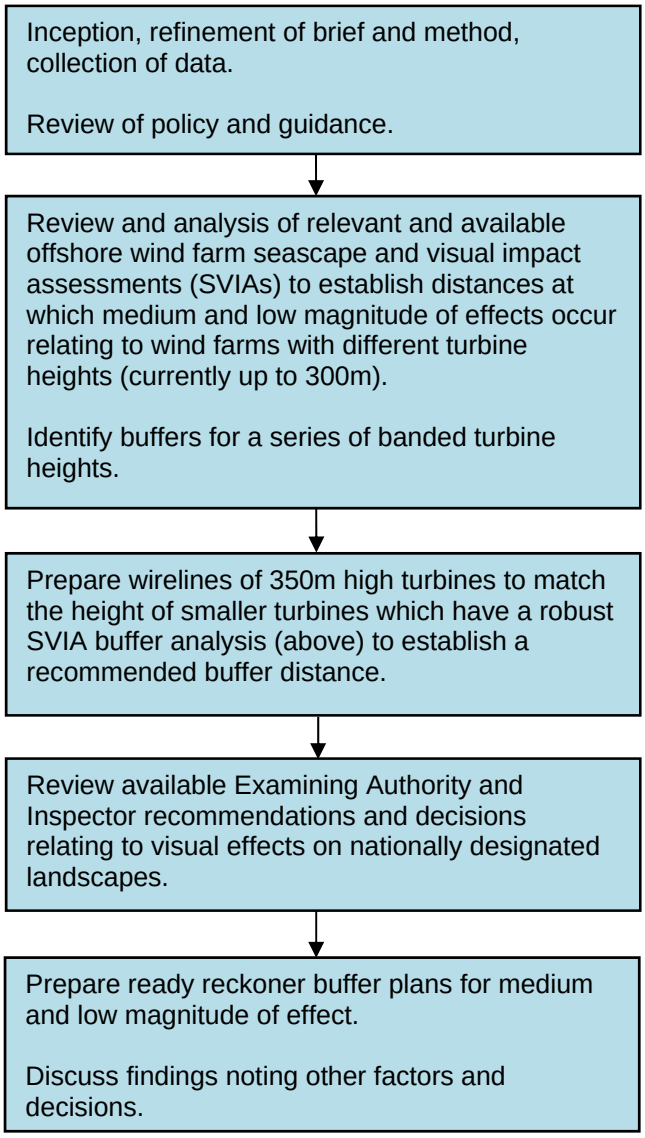
This report sets out the broad study approach in Chapter 2, a brief policy context in Chapter 3, a review of relevant guidance and previous studies in Chapter 4, the findings of the seascape and visual impact assessments (SVIA) analysis in Chapter 5, the findings of the wireframe analysis in Chapter 6, discussion of examination and public inquiry decisions in Chapter 7, and finally an overall discussion and preliminary conclusions in Chapter 8. The detailed analyses of the SVIAs are in Appendix A.

The study is a technical exercise and the report uses a number of technical terms for precision and as a means for reaching conclusions. These terms are defined in the Glossary in Appendix B.

4. Study approach and process

4.1. Process

The study process is summarised below:



4.2. Focus and limitations of the report

The brief effectively requires the study to research and map buffers for different heights of turbines up to 350m high required to avoid significant adverse effects on high sensitivity coastal visual receptors. This study focusses on potential recommended buffers for National Parks and AONBs which are accorded the greatest weight in relevant legislation. It is acknowledged that other sensitive receptors need to be considered in relation to offshore windfarms including Heritage Coasts, World Heritage Sites and point features such as coastal forts. These will be considered in subsequent reports.

This report has a scope limited to analysing assessed visual effects only, and organising this information in relation to turbine height only. Turbine height is only one factor in determining the magnitude of the effect and thence the likely significance of effect. Other factors include the extent of a windfarm in relation to the view, the relationship with the coastal/seascape setting and character and with other developments including windfarms. Therefore this report has to be read with the two other forthcoming parts of the study as well as good practice guidance in order to optimally locate and design development.

The research into SVIAs was completed in late December 2018.

5. Policy Context

5.1. National policy

The UK Government produces National Policy Statements (NPSs) under the Planning Act (2008) which sets out Government policy for the development of Nationally Significant Infrastructure Projects (NSIPs). National policy statements EN-1 and EN-3 address national infrastructure planning in relation to renewable energy including offshore wind farms with an output above 100MW. Nationally designated landscapes are confirmed as having the highest status of protection and their statutory purposes should be taken into consideration. Inspectors and Examining Authorities make their recommendations to the Secretary of State in respect of these developments.

5.2. Welsh policy

The Well-being of Future Generations (Wales) Act 2015 aims to improve the long term social, economic and environmental and cultural well-being of Wales. It covers all of Wales and the inshore marine planning region.

Planning Policy Wales (PPW10) states that NRW is responsible for ensuring that statutorily designated sites are properly protected and managed. In development planning, great weight should be given to the purposes of National Parks and AONBs including conserving and enhancing their natural beauty and their special qualities. This applies to both activities that lie within, or in the setting, of the designated area (6.3.5-6.3.9). Many of these designations in Wales are located on the coast and

some of their most important special qualities relate to the setting provided by the sea. For instance Pembrokeshire Coast's qualities include its coastal splendour, islands, remoteness, tranquillity and wildness. In the Llyn AONB qualities include the connection between land, coast and sea.

5.3. UK marine policy

The Marine and Coastal Access Act (2009) provides the framework for marine planning in Wales and across the UK. It sets Welsh Ministers as the Marine Plan authority for the Welsh Inshore and Offshore regions. The UK Marine Planning Policy Statement (MPS) provides the framework for preparing marine plans including the Welsh National Marine Plan. When considering the impact of an activity it states that the marine plan authority (MPA) *'should take into account existing character and quality, how highly it is valued and its capacity to accommodate change...'*(2.6.5.3).

For any development relatively close to nationally designated areas such as National Parks, AONBs and Heritage Coasts, the MPA should have regard to the specific statutory purposes.

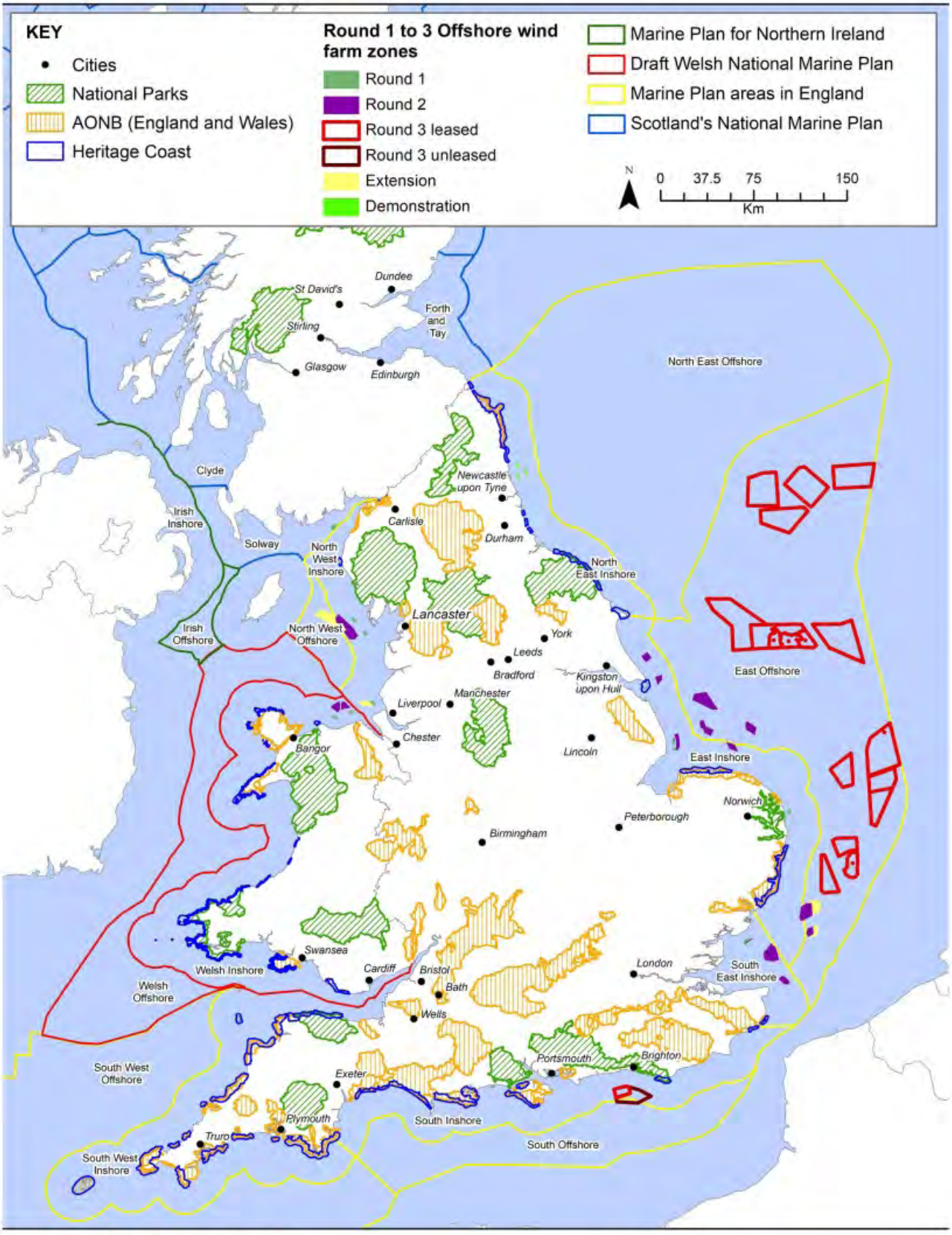
The UK Offshore Energy Strategic Environmental Assessment (0ESEA) process considers and informs decisions and plans and programmes for potential future offshore energy at a UK level, and is supported by Welsh Government. This reinforces the need for a strategic and consistent view in cross-border areas such as in the Bristol Channel and in North Wales.

The Crown Estate has already facilitated three rounds of offshore wind development with extensions with many windfarms being implemented (see Figure 1). The UK Government has now announced an intention to deploy further offshore wind developments up to a maximum additional capacity of up to 7GW in England and Wales. In addition to running a programme to facilitate extensions of existing windfarms in England and Wales, The Crown Estate have announced leasing Round 4 to determine further areas of sea bed that might be leased for new offshore wind. These include the North Wales region but also includes Anglesey as an area for further consideration. These are shown in Figure 2. The Crown Estate are mapping constraints and will consider seascape and visual resources as part of this process.

5.4. Welsh marine policy

The draft Welsh National Marine Plan supports (where appropriate) further commercial development of offshore wind over the next 5 to 10 years (page 179) but does not allocate specific resource areas for wind. Policy ELC 01 Low carbon energy states that proposals for wind energy are strongly encouraged. In order to understand future opportunities relevant public authorities should, in liaison with the sector and other interested parties, collaborate to:

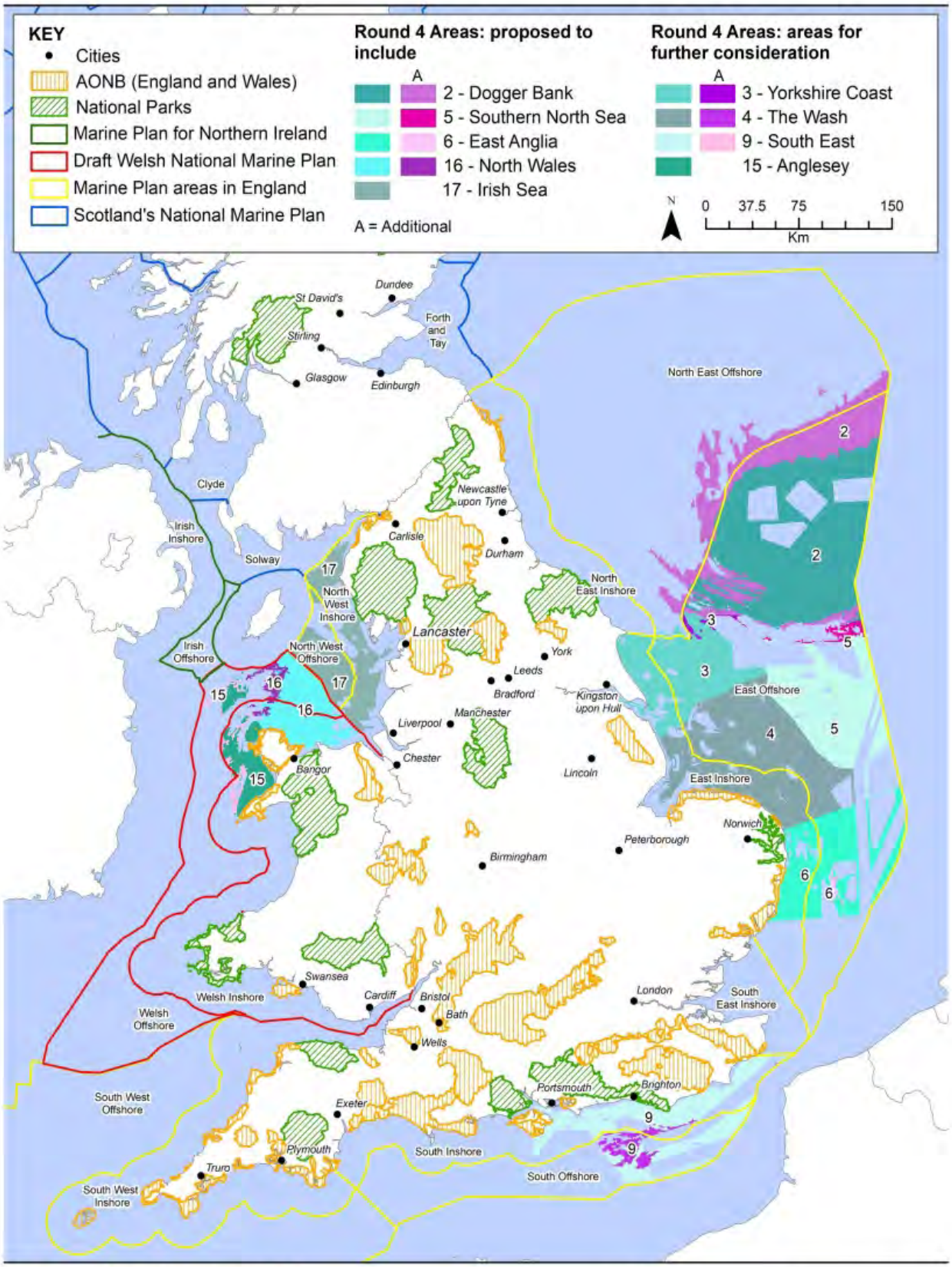
- Collect evidence to support understanding of environmental constraints and opportunities.
- Support understanding of optimal sites and offshore wind developments across Wales.



www.whiteconsultants.co.uk

08/03/19 | v4 | Drawn: HK | Checked SW

Figure 1
Rounds 1-3 offshore windfarm zones, marine plan areas, national landscape designations and Heritage coasts



www.whiteconsultants.co.uk

08/03/19 | v3 | Drawn: HK | Checked SW

Figure 2
Round 4 offshore windfarm zones, marine plan areas, national landscape designations and Heritage coasts

Relevant evidence should be made widely available to support planning and decision-making. This study is intended to contribute to this evidence base.

The draft Marine Plan policy on Designated landscapes (SOC_6) states that proposals that demonstrate that they are compatible with the purposes and special qualities for which National Parks or AONBs have been designated are encouraged.

The Seascapes policy (SOC_7) indicates that proposals should demonstrate how potential impacts on seascapes been taken into consideration at an early stage. In order of preference adverse impact should be avoided, minimised or mitigated. National Marine Character areas which divide up and describe the seascape of the inshore region are referred to. Whilst these have wider relevance to the location of marine energy they are an additional consideration to, and do not inform, the visual buffers identified in this study.

The Historic assets policy (SOC_5) has a similar test to the seascapes policy. Proposals should demonstrate how potential impacts on historic assets and their settings have been taken into consideration.

6. Review of relevant guidance and studies

6.1. Guidelines and reports

The most relevant guidelines and reports taken into consideration in this study are as follows:

- Guidance on the Assessment of the Impact of Offshore Windfarms: seascape and visual impact report, DTI, 2005.
- Guidelines for Landscape and Visual Impact Assessment, Edition 3, (GLVIA 3) LI and IEMA, 2013.
- IEMA Special Report – The state of environmental impact assessment practice in the UK, IEMA, 2011.
- Offshore With Energy Generation: Phase 1 proposals and environmental report, DTI, BMT Cordah, 2003.
- UK Offshore Energy Strategic Environmental Assessment 2, DECC, March 2011.
- UK Offshore Energy Strategic Environmental Assessment 3, DECC, March 2016.

Other guidance which helps inform the study in a broader sense includes:

- An assessment of the sensitivity and capacity of the Scottish seascape in relation to offshore windfarms (Scottish Natural Heritage commissioned report 103, 2005)- a ground-breaking document led by Dr John Benson forming the basis of subsequent UK guidance including the 2005 DTI report above.
- Sensitivity of Welsh seascapes to offshore renewable energy developments (Countryside Council for Wales Policy Research Report number 08/5, 2009, Briggs and White)- guidance for wind, wave and tidal energy upto 24km offshore within the framework of original CCW seascape guidance.

- NECR 105 (Natural England)- current broad brush guidance on seascape character assessment.
- Offshore renewables- guidance on assessing the impact on coastal landscape and seascape (Scottish Natural Heritage, March 2012)- informing scoping assessments.
- Topic Paper 6 (Countryside Agency, 2002)- concerning strategic landscape sensitivity and capacity and under review.

The key guidance is discussed below.

6.2. Guidance on the assessment of the impact of offshore wind farms: seascape and visual impact report, (DTI, 2005)

This document is referred to specifically in relation to offshore windfarms in EN – 3. The purpose of the seascape assessment method is to inform environmental impact assessment of specific schemes and therefore focuses at a detailed level. As it predates NECR105 and GLVIA3 it is dated in some respects. However, most of the principles hold and this comprehensive document also has relevance at strategic level.

Key views are regarded as an essential component of data collected using a 35km seaward limit of visual significance.

Useful definitions of magnitude of change are set out to assist consistency of approach in Table 5 of the DTI report.

Table 1 DTI report magnitude of change: names, descriptors and definitions

Magnitude/ size class	Other terms used	Name	Descriptors – appearance in central vision field	Definition
Very Large	High, very high substantial, very substantial,	Dominant	Commanding, controlling the view, foremost feature, prevailing, overriding	Proposed offshore wind farm causes very large alteration to key elements / features / characteristics of the baseline seascape or visual conditions (pre-development) such that there is a fundamental change.
Large	Medium-high, moderate - substantial	Prominent	Standing out, striking, sharp, unmistakeable, easily seen	Proposed offshore wind farm causes large alteration to key elements / features / characteristics of the baseline seascape or visual conditions (pre-development) such that there is an unmistakeable change.
Moderate	Medium	Conspic-uous	Noticeable, distinct, catching the eye or attention, clearly visible, well defined	Proposed offshore wind farm causes moderate alteration to elements / features / characteristics of the baseline seascape or visual conditions (pre-development) such that there is a distinct change.
Small	Low, slight, minor	Apparent	Visible, evident, obvious, perceptible, discernible, recognisable	Proposed offshore wind farm causes small loss or alteration to elements / features / characteristics of the baseline seascape or visual conditions (pre-development) such that there is a perceptible

				change.
Magnitude/ size class	**Other terms used**	**Name**	**Descriptors – appearance in central vision field**	**Definition**
Very Small	Low, slight or minor-negligible	Inconspic-uous	Lacking sharpness of definition, not obvious, indistinct, not clear, obscure, blurred, indefinite, subtle	Proposed offshore wind farm causes very small loss or alteration to elements / features / characteristics of the baseline seascape or visual conditions (pre-development) such that there is a distinguishable change.
Negligible		Faint	Weak, not legible, near limit of acuity of human eye	Proposed offshore wind farm causes negligible loss or alteration to elements / features / characteristics of the baseline seascape or visual conditions (pre-development) such that there is no legible change.

Source: Table 5 (DTI report) - Magnitude of change: names, descriptors and definitions

These terms are considered to remain valid and are used frequently in SVIAs.

Significance is derived from combining the sensitivity of a receptor and the magnitude of change. Table 6 of the DTI report sets out how this is suggested in the guidance:

Table 2 DTI report significance of effects

Landscape and visual sensitivity	**Magnitude of change**				
	Very large	**Large**	**Moderate**	**Small**	**Very small**
Very high	Major	Major	Major	Major/ moderate	Moderate
High	Major	Major	Major/ moderate	Moderate	Moderate/ minor
Medium	Major	Major/ moderate	Moderate	Moderate/ minor	Minor
Low	Major/ moderate	Moderate	Moderate/ minor	Minor	Minor/none
Very low	Moderate	Moderate/ minor	Minor	Minor/none	None

Source: Table 6 (DTI Report) - Significance of effects

Note
- Boxes shaded red/pink are considered to be significant effects,
- Boxes shaded amber are potentially significant.
- Boxes not shaded are considered to be not significant.

This indicates that major and major/moderate effects are significant. It is stated that effects of moderate significance are most likely to be not significant, but it is feasible that they could be judged as significant, depending on the particular circumstances arising. It summarises effects of moderate significance as being potentially significant in the table notes.

6.3. Guidelines for Landscape and Visual Impact Assessment (GLVIA3) (2013)

GLVIA3 defines seascape as per the UK Marine Policy Statement and states that any assessment should carefully consider the relationship between land and sea in coastal areas and also take account of possible requirements to consider the open sea (2.9). Methods to assess the character of seascapes are being developed and the latest available guidance should be referred to. The guidance text does not refer to the DTI (2005) guidance for assessing offshore windfarms. As such it is not considered to supersede it and both documents are relevant in the context of other emerging guidance and studies. A review of SVIAs for individual windfarms bears out this approach (eg Navitus, Rampion, Burbo Banks Extension).

GLVIA3 sets out the principle of determining significance of effect through combining the sensitivity of receptor with the magnitude of effect.

The main differences with DTI 2005, which was based on GLVIA 2, are that the landscape/seascape sensitivity is explicitly derived from combining the susceptibility of the receptor to a type and scale of development with the value of an area. The latter is divided into international, national, local or community value. This therefore builds in an increased emphasis on value which is relevant to National Parks and AONBs.

The magnitude of seascape or visual effect (6.38-6.41) is stated as combining consideration of the scale or size of effect with the extent of the area affected and duration/reversibility of that effect. The size or scale of effect includes consideration of:

- the scale of change in the view including the proportion of the view occupied by the proposed development
- the degree of contrast or integration
- the nature of the view in terms of the relative amount of time over which it will be experienced on whether views will be full, partial or glimpses.

The geographical extent of the visual effect is likely to reflect:

- the angle of view in relation to the main activity receptor,
- the distance of the viewpoint from the proposed development
- the extent of the area over which the change would be visible (combining a number of viewpoints such as on a coastal footpath or over a designated area).

The duration and reversibility of visual effects considers the amount of time that the development is likely to be present and whether it can be removed at the end of that

period. Offshore windfarms would normally be in position for 25 years and so this can be considered to be long term but reversible.

The first two factors of scale of change and extent overlap. For instance, the distance of a viewpoint from the proposed development will determine the scale of change in the view.

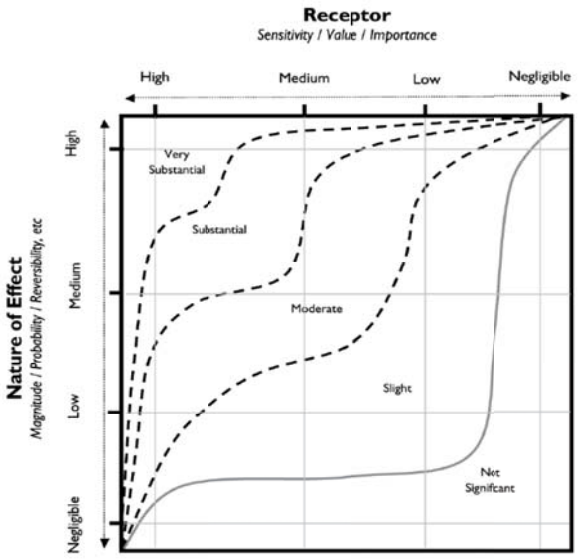
The relative weighting of the three main factors are not specifically discussed in the guidance. There are some practitioners who give them equal or almost equal weight. This means that there is potential for the overall magnitude of effect to be less than the scale of effect alone. However, others give most weight to the scale of effect and extent (in terms of distance). As offshore windfarms are long-term, the overall magnitude of effect is therefore often at the same level as the scale of effect. For a study of this nature, it is sensible to take the precautionary approach and consider that the scale of effect in an SVIA is likely to be at a similar level to the magnitude of effect.

GLVIA 3 discusses cumulative effects, setting out the alternative approaches of assessing the combined effects of existing and proposed developments or just the additional cumulative effects of a given development. Neither approach is given more weight than the other. This study considers that the combined effects of developments is the most important measure to inform this report's findings where a windfarm extension is assessed.

6.4. IEMA Special Report – The state of environmental impact assessment practice in the UK, 2011.

GLVIA3 discourages the use of matrices on their own to derive significance from sensitivity and value but IEMA has issued guidance which complements the approach. The diagram below gives greater flexibility for interpretation of significance but is generally in line with the DTI report Table 6 above.

Table 3 IEMA guidance on deriving significance of effects



Derived from Figure 6.3,page 61- IEMA Special Report – The state of environmental impact assessment practice in the UK, 2011.

6.5. Offshore With Energy Generation: Phase 1 proposals and environmental report, DTI, BMT Cordah, 2003

The assessment of seascape draws on the Hill et al (2001) CCW guidance applied within the constraints of a strategic desk based study. Seascape units are defined characterised and attributed sensitivity. The potential for major, medium and minor effects are defined in distance bands based on CCW guidance and further work by Briggs (2003). This is based on information viewing land from the sea. The conclusions were that:

- Up to 10km away we can see field patterns, clusters of buildings, woodlands etc
- Up to 24km we can see broad colours and textures representing towns and forests etc and large manmade structures such as power stations and turbines.
- Above 24km we struggle to see recognisable detail on land.

Based on this information low or no risk areas for offshore wind farms are identified by combining sensitivity with these likely visual impacts. It is important to note that turbines are expected to be a maximum of 160m high to blade tip.
The significance of effect is a product of sensitivity of seascape unit and magnitude of effect in accordance with GLVIA (2002) guidelines. The following magnitudes of effects were derived from CCW guidance and consultation (p5-1):

- Substantial/high effect: 0-8km
- Moderate/medium effect: 8-13km
- Minor/low effect: 13-24km
- Negligible effect: 24km+

The resulting table of significance in the report is shown in Table 2.3 of the report.

Table 4 IEMA guidance on deriving significance of effects

Seascape unit sensitivity	Significance of effect		
	Possible minor or no effect – Preferred Areas	Possible medium effects threshold	Possible major effects threshold
Low/no sensitivity	8km+ offshore	N/A*.	<8km offshore
Medium sensitivity	8km+ offshore	8-13km offshore	<8km offshore
High sensitivity	24km+ offshore	13-24km offshore	<13km offshore

Source: Table 2.3 (DTI BMT Cordah report) – Effects of proposed development for different seascape unit sensitivities

(Note: it is considered that one box of the table is incorrect- medium sensitivity/preferred area should read 13km+, not 8km +)

In order to avoid significant effects the outer limits of each of these ranges are applied i.e. 8km the closest distance for low sensitivity coasts, 13km for medium sensitivity coasts and 24km for high sensitivity coasts. The latter could therefore be considered to apply to National Parks and AONBs.

Comments on Approach

The distances for magnitude of effects were derived from initial research by CCW and others without the benefit of assessment of wind farm proposals such as seascape and visual impact assessments (SVIAs) or a review of constructed offshore wind farms. It is also worth noting that CCW's consideration of distances greater than 12 nautical miles offshore was generally curtailed by the limits of their remit.

The Round 2 SEA (2003) report implies that effects of moderate significance are significant. This differs from the conclusions of the DTI report (2005) which considers that effects of major and major/moderate significance are significant, but that moderate effects are most likely not to be significant, although may be in certain circumstances. As a result of this potential and the brief's requirement to establish the minimum distance where there are no significant effects to shoreline observers, the precautionary approach is taken i.e. effects of moderate significance are considered as significant.

6.6. UK Offshore Energy Strategic Environmental Assessment 2 (DECC), March 2011

The OESEA report (DECC, 2009) addressed the visual impacts of turbines of 2-3.6MW and 5-6MW turbines. The results from the SVIA analysis are as follows (Table 2.1):

Table 5 OESEA 2009 SVIA analysis

	2-3.6MW	5-6MW
Average (Average) distance where medium magnitude of effect occurred	10.1km	14.2km
Average (Maximum) distance where medium magnitude of effect occurred	11.9km	15.0km
Average (Average) distance where low magnitude of effect occurred	17.0km	25.8km
Average (Maximum) distance where low magnitude of effect occurred	21.2km	32.0km

Source: White Consultants (2009)

Source: Table 2.1 OESEA report (DECC, 2009)

Based on a wireline assessment of similar sized wind farms with three different turbine sizes, the following indicative conclusions are drawn (page 130):

Table 6 OESEA 2009 Threshold for significance for turbines of English seascape development scenario at 22 m ASL

Turbine size	Height to blade tip	Height to nacelle	Threshold of significance for seascape units of high sensitivity	Threshold of significance for seascape units of medium sensitivity
3.6MW	137m	83.5m	18km	13km
5MW	175m	112.5m	24km	18km
10MW	190m	115m	24km	18km

Source: White Consultants (2009)
Note: Based on development scenarios of 50 (10MW), 98 (5MW) and 155 (3.6MW) turbines in a grid pattern separated by 550m.

Source: Table 2.2 OESEA report (DECC, 2009)

6.7. UK Offshore Energy Strategic Environmental Assessment 3 (DECC), March 2016

This document aims to help to inform licensing and leasing decisions in Round 3 by considering the environmental implications of potential activities including offshore windfarms. The seascape and visual section (page 283-324) sets out issues such as the effect of the curvature of the Earth, aspect of view (sunset in Wales's case), intervisibility of sea and land, haze and metereological factors affecting visual range, consideration of visual buffers and European experience.

The report explores haze and meteorological factors affecting visual range. The report quotes the SNH (2005) report (after Husar and Husar, 1998) in suggesting that haze may limit visual range in Wales to 26km (Table 5.24).

This appears to be countered by published Meteorological Office data below which indicate that visibility can exceed 35 km, albeit on limited days of the year (see Table 7 below).

Table 7 Distribution of percentage days visibility for weather stations over a 10 year period

Weather Stations	**Visibility Distance (km)**							
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	35+
St Athan, South Wales % days of visibility- cumulative totals	100	88.4	73.2	56.3	39.2	24.2	7.1	3.2
Rhyl, North Wales % days of visibility- cumulative totals	100	91.7	78.6	68.3	53.4	35.3	15.9	10

Source: OESEA 3, 2016, Table 5.25 Distribution of percentage days visibility for coastal weather stations over a 10 year period

The report states that rainfall incidence, sunshine hours and propensity for fog provide additional meteorological factors in determining relative visibility of offshore structures. Turbines located 30km from shore may be visible only on limited occasions when haze and precipitation are low and sunshine remains bright.

7. Seascape and visual impact assessments (SVIA) analysis

7.1. Our approach

This chapter considers the Seascape, Landscape and Visual Impact Assessments (SVIAs) carried out as part of the Environmental Impact Assessments (EIAs) for Round 1 to 3 zones and Scottish Territorial Waters (STW) wind farm developments.

Figures 1 and 2 shows the location of the zones and proposals respectively in England and Wales. The study analyses offshore windfarms off the UK coast, including Wales, England and Scotland. The reason is to obtain data on as many relevant SVIAs as possible and try to optimise the potential for achieving robust data and to maximise consensus. However, buffers are only put forward relating to Welsh national landscape designations and to nearby national designations in England.

As already stated, the main objective for analysing the Seascape, Landscape and Visual Impact Assessments (SVIAs) of individual offshore wind farms is to help avoid significant adverse effects on the purposes and special qualities of National Parks and AONBs.

The DTI guidance (2005) states that 'A viewpoint assessment should be carried out to identify and evaluate the potential effects on available views and visual amenity arising from the proposed offshore wind farm at specific representative locations in the study area'. The conclusions on the degree of effect on these viewpoints will also inform the expected effect on seascape character. In order to meet the EIA requirements, the choice of viewpoints must go through consultation with the local authority and key stakeholders whilst also taking into consideration comments made during public consultation.

The magnitude of change to receptors is broadly assessed in a standardised way based on GLVIA 3 and DTI (2005). The factors which influence magnitude of effect include the height, extent and nature of development, the distance of development from a viewpoint, the degree of change in a view, the degree of contrast or integration, the angle of view of a receptor, the extent of area over which changes would be visible, the duration, reversibility and nature of effect.

Inevitably there is some variation in how the magnitude of change is defined in the SVIAs reviewed. The majority tend to follow the definitions as suggested by the GLVIA (2002 and 2013) and SNH (2005) as set out in their Table 5. Assessments may use other terms for magnitude. Our interpretation of these definitions is set out below in Table 8.

The range considered for the purposes of the brief is low and medium magnitudes of effect. Combined with a high sensitivity receptor a low magnitude of effect is likely to result in an effect of moderate significance. A medium magnitude of effect is likely to result in an effect of major moderate significance. As already discussed, moderate can be significant and major moderate is classified as significant in the vast majority of SVIAs.

Table 8 Terms for Magnitude of Effect

Magnitude/size class used in this report	Other terms used for magnitude
Very high	Very large or very substantial, high or substantial. (Assessments may not differentiate between very large and large)
High	Large or substantial, medium- high or moderate – substantial. (Assessments may not differentiate between very large and large)
Medium	Moderate
Low	Small, slight, minor.
Low-negligible	Very small, slight-negligible, minor-negligible

7.2. Cumulative effects

Some offshore windfarms have been assessed in SVIAs against a baseline of no other existing windfarms present. However, in other cases windfarms have been assessed in SVIAs against a baseline of existing or consented offshore windfarms. This occurs particularly where there are extensions to existing windfarms. The magnitude of effects are likely to be considered to be less against this baseline than if there are no other wind farms present unless the proposed wind farm is significantly larger in height and extent than the existing wind farm/s. Overall, this factor can depress the magnitude of effect and therefore reduce the distances at which different levels of effects can occur.
The alternative is to consider the cumulative assessment of the proposed and existing windfarms. SVIAs take different approaches to cumulative assessment. Some consider the additional effect of the proposed development over and above existing similar development while others consider the combined cumulative effects. The former approach is not helpful in the analysis of potential buffers but we consider that the combined approach is relevant. We have used this in one instance (the Walney extension) where the proposed wind farm links to three earlier windfarms in one block.

7.3. Turbine heights and the Rochdale Envelope

Many SVIAs assess the effects of a range of sizes of turbines in order to explore the best option and give developers and decision makers a choice. The ‘Rochdale Envelope’ is a pragmatic approach used in EIAs/SVIAs to define the maximum parameters of a wind as part of the consenting process ie the worst case scenario of the highest turbine height and the greatest extent. We have taken the highest of any turbine heights assessed into the analysis as this would normally be expected to have the greatest effect. We note both heights in our detailed analysis in Appendix A. However, it should be noted that sometimes proposals for higher turbine heights with greater spacing and potentially less extent are considered to have less visual/seascape impact than lower turbine height options with closer spacing and greater extent. This provides another note of caution in the application of the SVIA analysis.

7.4. Reliability of SVIA evidence

The SVIAs have been carried out by a range of consultancies and individuals with a range of experience in judging effects of wind turbines offshore. They do not necessarily reflect the views of statutory authorities or third parties. The study team have not verified the accuracy of judgements through on-site visits as part of this study although some of the windfarms have been assessed for statutory authorities as part of other commissions. These have revealed that some SVIA judgements possibly understate the magnitude of effect in some cases. Therefore the results derived from the analysis have to be considered with a degree of caution.

7.5. Selection of SVIAs

The research has been carried out in order to maximise the number of relevant windfarms and therefore the number of viewpoints assessed. It has not been limited to only windfarms that may affect viewpoints within National Parks and AONBs. It is hoped that this will lead to a more robust dataset than one relying on significantly fewer viewpoints.

The criteria used to select suitable developments/SVIAs for analysis are:

- Where development is located close enough to the coast for visual effects on coastal receptors to be assessed as part of the SVIA.
- Commercial size of windfarm (not small developments/pilots of, say, 2 turbines, such as Beatrice Demonstration or Dounreay)
- Availability of SVIAs from web sources
- Suitability of assessment in the SVIA.

For the Rounds 1 and 2 wind farms, Lincs wind farm was identified as an anomaly to the rest of the SVIAs with a much lower set of distances for the magnitudes of change. This was because two Round 1 Wind Farms had been included within the baseline assessment. Therefore, the scheme has been omitted.

Some windfarms are too far away from the coast to contribute relevant SVIA data. These include the Dogger Bank windfarms, Hornsea 1 and 2, East Anglia ONE and THREE.

Current windfarms with larger turbines in early planning or scoping stages such as Hornsea 4 and East Anglia TWO do not have completed SVIAs and so cannot be included.

7.6. SVIAS reviewed

The SVIAs analysed up to the end of December 2018 are as follows:

Round 1

- Kentish Flats
- North Hoyle

Round 2

- Docking Shoal
- Gabbard
- Gunfleet Sands 2
- Gwynt y Môr
- London Array 1
- Sheringham
- Thanet
- Walney
- West of Duddon Sands
- Westermost Rough A

Round 3

- Atlantic Array
- Moray East
- Moray West
- Navitus Bay
- Rampion Offshore

STW Sco 1

- Beatrice Offshore
- Hywind Scotland Pilot Park (demonstration)
- Inch Cape
- Neart na Gaoithe

Extensions

- Burbo Bank Offshore Extension
- Walney Offshore Extension

7.7. Analysis of SVIAs

The individual analyses of SVIAs are in Appendix A in alphabetical order. For each windfarm the proposed output, number of turbines, turbine heights and nearest distance from the coast are recorded. SVIA viewpoints are selected which relate to coastal receptors and the distance from the nearest turbine, the sensitivity of receptor, magnitude of effect and significance of effect are recorded. The maximum and average distance where low and medium magnitude of effect are calculated. In addition, any combined cumulative effects from viewpoints are recorded.

The results from the twenty three SVIA viewpoint assessments are collated in Table 9. The windfarms are arranged in groups of similar turbine heights which relate to commonly used turbine outputs. The maximum and average distances at which there would be low and medium magnitude of effect on receptors for each SVIA are summarised and then, themselves averaged for each group.

Table 9: Summary analysis of visual effects

Windfarm	Round	Status	Max. turbine height to blade tip (m)*	No. of turbines	Maximum windfarm capacity (MW)	Nearest coast km	Existing windfarms in baseline?	No. of SVIA viewpoints	Low magnitude of effect		Medium magnitude of effect	
									Average Distance km	Maximum Distance km	Average Distance km	Maximum Distance km
North Hoyle	1	Implemented	107	30	60	7.5	n	12	18.3	21.8	11.2	13.5
Gunfleet Sands 2	1	Implemented	128	22	173	8.5	y	8	14.0	19.6		
Gwynt y Môr	2	Implemented	140	160	576	18	y	35	28.0	35.8	14.3	15.3
Kentish Flats	1	Implemented	140	30	90	8	n	13	21.1	27.9	11.2	12.1
Docking Shoal	2	Withdrawn	145	177	540	14	y	8	31.6	31.6	19.1	19.1
								Averages	**22.6**	**27.3**	**14.0**	**15.0**
West of Duddon Sands	2	Implemented	150	139	389	14	y	18	23.2	26.3	11.0	14.6
Thanet	2	Implemented	150	100	300	11	n	10	21.5	27.7	17.5	17.5
Gabbard	2	Implemented	170	140	504	23	n	6			31.0	33.5
Sheringham	2	Implemented	172	88	317	17	n	26	23.5	25.0	19.2	21.0
Westermost Rough A	2	Implemented	172	35	210	8	n	9	32.6	32.6	15.3	17.5
London Array 1	2	Implemented	175	271	630	21	y	18	21.0	21.0		
								Averages	**24.4**	**26.5**	**18.8**	**20.8**
Hywind Scotland pilot	Demo	Implemented	178	5	30	23	n	7	25.9	29.0		
Atlantic Array	3	Withdrawn	180	278	1390	14	n	36	28.5	37.5	20.0	27.5
Beatrice Offshore	Sco 1	In construction	194	142	588	22	n	16	33.1	33.1	22.2	25.6
Neart na Gaoithe	Sco 1	Consented	197	128	448	15	y	21	33.8	39.0	28.0	28.0
Navitus Bay	3	Refused	200	121	970	10	n	12	28.2	28.2	19.5	23.1
Walney 1	2	Implemented	202	93	186	15	y	18	23.2	23.4	16.5	18.8
Moray East	3	In constrct'n	204	186	1116	22	n	22	43.0	49.0	27.0	34.0
Rampion	3	In constrct'n	210	175	400	13	n	29	26.4	29.5	19.9	30.0
Walney extension**	2.5	Implemented	222	207	750	19	y	17	21.0	21.0	29.5	31.3
Burbo Bank extens'n	1	Implemented	223	36	254	7	y	18	21.7	30.6	15.1	22.0
								Averages	**28.5**	**32.0**	**22.0**	**26.7**
Moray West	3	Submitted	285	86	751	22	y	25	47.0	53.0	26.0	28.0
Inch Cape	Sco 1	Consented	291	72	1000	15	y	26	36.1	52.4	29.7	34.8
Notes	* Turbine tip height maximum assessed in SVIA				** cumulative impacts used in main table			**Averages**	**41.6**	**52.7**	**27.9**	**31.4**

7.8. SVIA findings

The average figures for the distance at which low and medium magnitude of effect for each range of turbine heights is shown below.

Table 10 Summary of distances at which low and medium magnitude of effect occur

Range of turbine heights to blade tip (m)	Low magnitude of effect		Medium magnitude of effect	
	Average Distance km	Maximum Distance km	Average Distance km	Maximum Distance km
107-145	22.6	27.3	14.0	15.0
146-175	24.4	26.5	18.8	20.8
176-225	28.5	32.0	22.0	26.7
226- 300	41.6	52.7	27.9	31.4

As the maximum distance for a level of effect is greater than the average, and is sometimes an isolated figure, the average is considered to be the most robust figure to reflect a consensus. However, the maximum distances should not be ignored as they may represent effects which could be significant for high sensitivity receptors (eg Navitus).

The average distances are illustrated in Tables 11 and 12 and the related buffers are shown in Figures 3 and 4.

Table 11 Distances at which average low magnitude of visual effect occurs for different heights of turbine

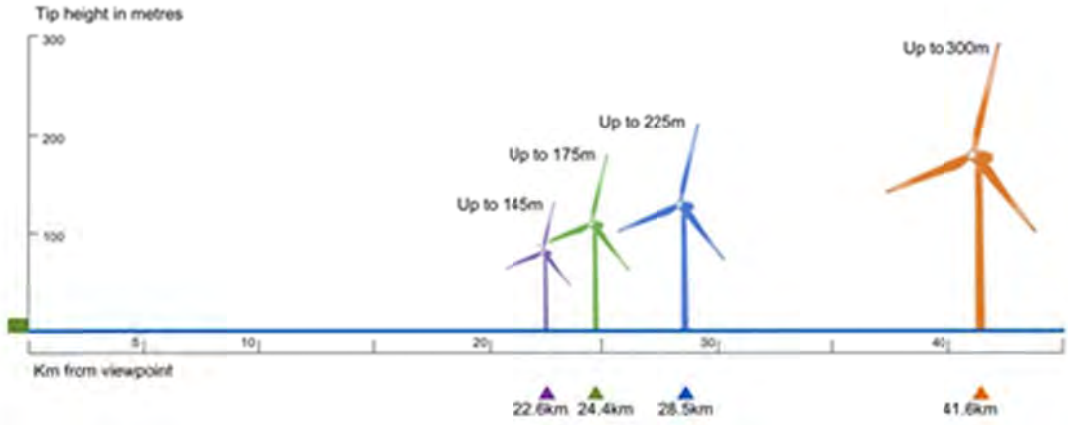
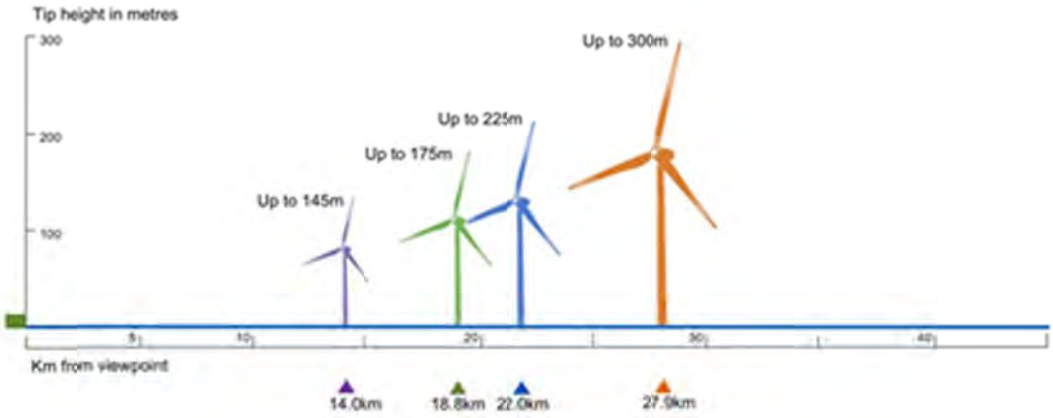


Table 12 Distances at which average medium magnitude of visual effect occurs for different heights of turbine



A very approximate ratio between turbine height and distance for an average low magnitude of effect is 1:133 and 1:100 for average medium magnitude of effect.

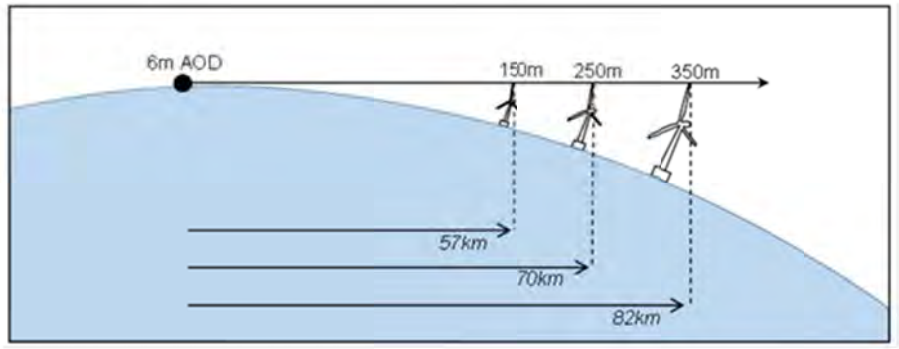
8. Wireframe analysis to establish buffers for 350m high turbines

8.1. Introduction

The SVIA analysis only considers the effects of turbines up to 300m high due to the limited number of suitable SVIAs currently available for larger turbines. There are also only two assessments which consider the effects of turbines in the range between 226m and 300m high. It is therefore appropriate to supplement the SVIA analysis of potential visual effects with a comparative wireframes analysis using the most robust SVIA data.

At greater distances out to sea the curvature of the Earth becomes a contributory factor in determining how much of each turbine can be seen. However, as the diagram below illustrates, 350m high turbines would need to be 82km offshore to theoretically be screened in full when viewed from 6m AOD. At this distance visibility modifiers, such as atmospheric interference, would have a more significant effect in any case.

Table 13 The effect of curvature of the Earth on turbine visibility



The distance at which the structure dips below the horizon increases when the height of the viewer increases. As the coasts of Wales, particularly designated areas, usually have a cliff or slopes adjacent to the coast the wireframes also explore views from 22m AOD and 100m AOD where a greater proportion of the turbine structure can be seen.

8.2. Method

The SVIA analysis has established robust distance data for various sizes of turbines including upto 145m high and 176-225m high. Our aim is to prepare wireframe scenarios showing an array of 350m high wind turbines in juxtaposition with arrays of 145m and 225m turbines where they all appear the same height. In theory, this would mean that the 350m high turbines at the located distance would potentially have a similar visual effect notwithstanding visibility modifiers.

The wireframes have been prepared using a virtual cylindrical projection of 700 field of view with a viewing distance of around 33-47cm for an A3 or A2 sheet. This produces a geometrically accurate image. SNH (2014) guidance on wind farm

visualisations recommends that photomontages should be viewed at a comfortable arm's length and wirelines at an A1 paper width (820mm). Therefore, these wireframe images are not intended for assessment in themselves and we make no judgement other than based on the SVIA derived analysis.

The scenarios are:

- Low magnitude of effects scenario- 145m turbine group at 22.6km nearest point from shore + 225m turbine group at 28.5km from shore + 350m turbines group to match height of others
- Medium magnitude of effects scenario- 145m turbine group at 14km from shore + 225m turbine group at 22km from shore + 350m turbines group to match height of others

The 145m high turbine array appears higher than the 225m high array in the medium magnitude of effects scenario when viewed at 6m AOD but lower when viewed from 100m AOD. However, overall, the 145m array appears smaller than the 225m array for the same level of effect in most views. We have matched the 350m turbines to the 225m turbines height at the middle viewing height of 22m AOD for both low and medium magnitude of effect scenarios. This is because the 225m group/range distance has the larger number of SVIAs underpinning it and is closer in size to the 350m turbine. The 350m high turbines appear slightly higher when viewed from 100m AOD and slightly lower when viewed from 6m AOD.

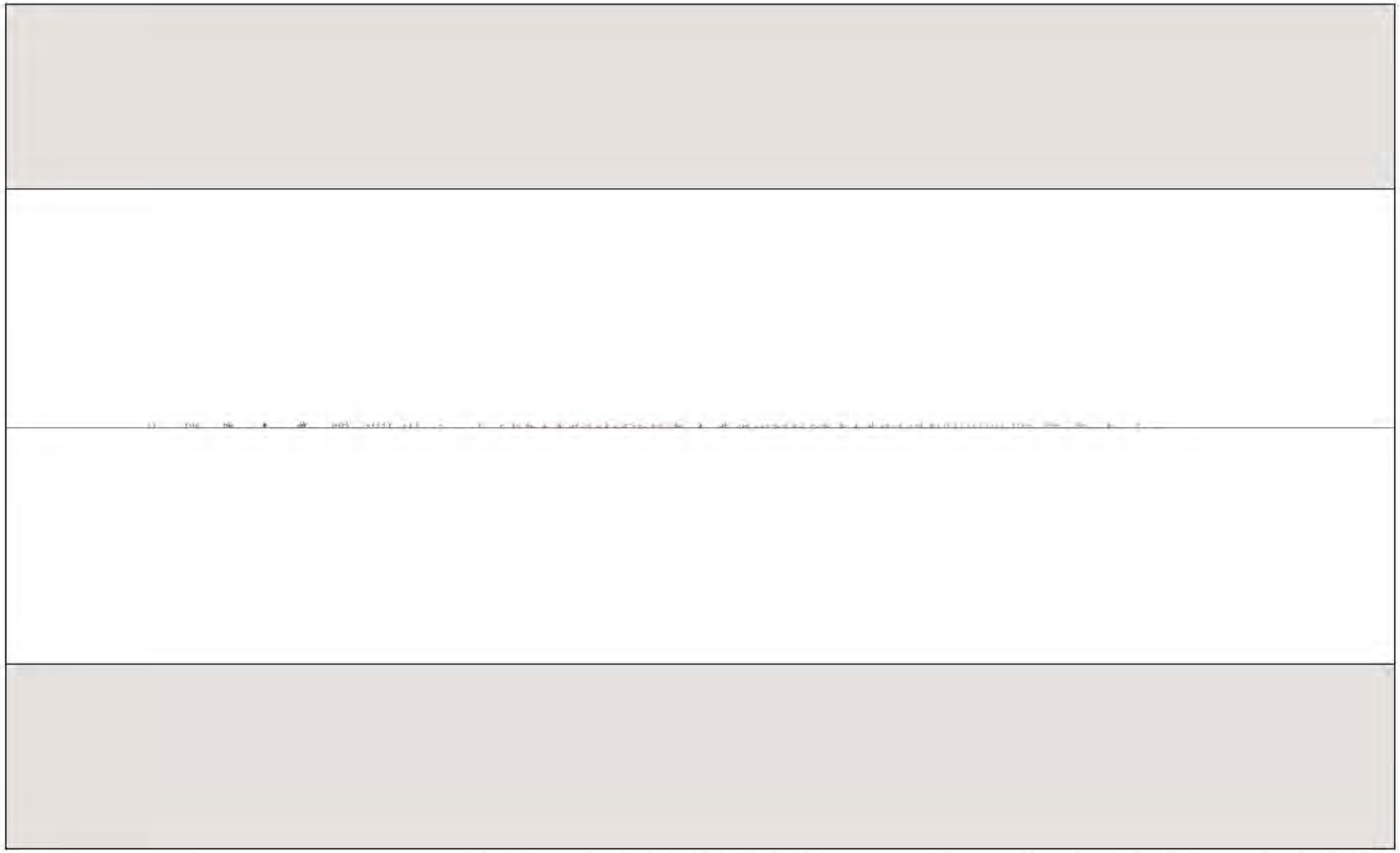
The scenarios are illustrated in Figures WS1-WS8.

8.3. Findings

The 350m high turbine array would be at the following distances offshore to have the following effects:

- Low magnitude of effects- 44km from shore
- Medium magnitude of effects- 32.8km from shore

This appears to be proportionally in line with the assessed effects of 300m high turbines in the SVIA analysis (41.6km and 27.9km respectively).



www.whiteconsultants.co.uk
Tel: 029 2236 2416

Key:

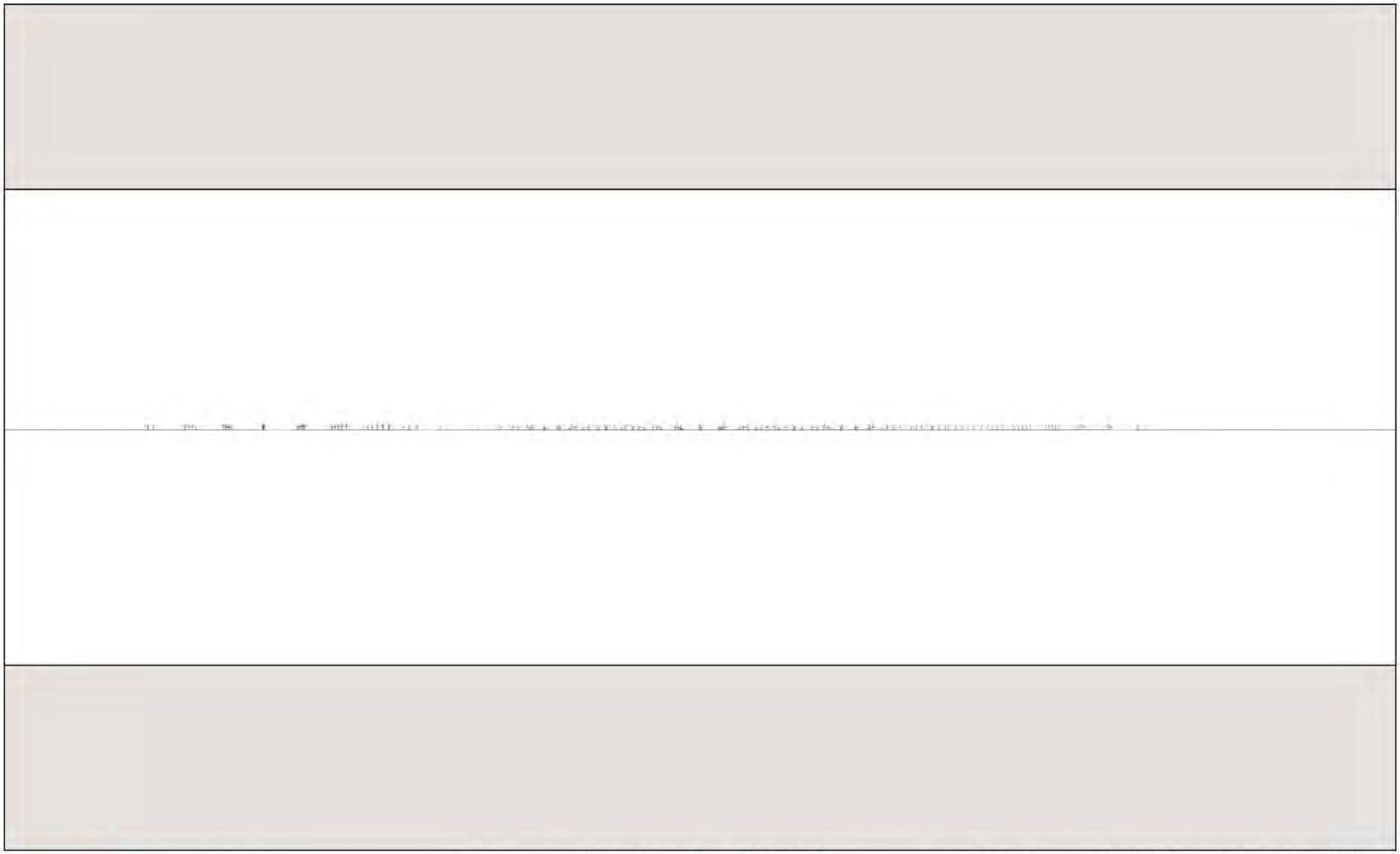
350m turbines
225m turbines
145m turbines

Viewing distance:	33cm for A3 sheet, 47cm for A2, 66cm for A1
Horizontal field of view:	Cylindrical Projection 70°
Distance to horizon:	9.4km
Turbine height to blade tip:	350m, 225m, 145m
Height to hub:	190m, 127.5m, 87.5m
Number of turbines:	70, 35, 35
Distance to turbines:	44.0km, 28.5km, 22.6km

Title: **Figure WS1: Low magnitude of effects scenario: 6m viewer height**

Date: March 2019
Status: Final

Notes: An earth's radius of 7430km has been used to account for the combined effects the earth's curvature and light refraction



www.whiteconsultants.co.uk
Tel: 029 2236 2416

Key:

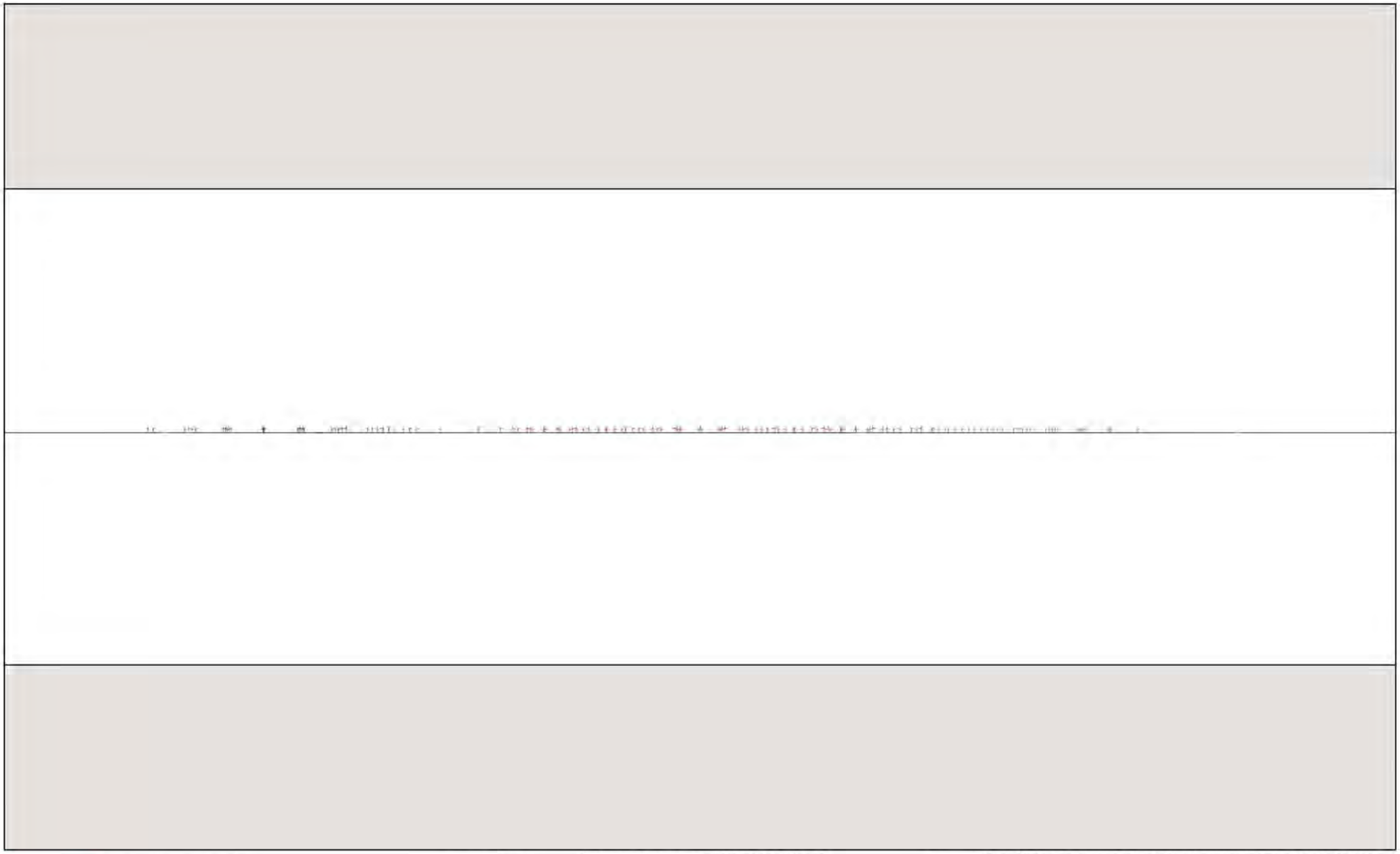
- 350m turbines
- 225m turbines
- 145m turbines

Viewing distance:	33cm for A3 sheet, 47cm for A2, 66cm for A1
Horizontal field of view:	Cylindrical Projection 70°
Distance to horizon:	9.4km
Turbine height to blade tip:	350m, 225m, 145m
Height to hub:	190m, 127.5m, 87.5m
Number of turbines:	70, 35, 35
Distance to turbines:	44.0km, 28.5km, 22.6km

Title: **Figure WS2: Low magnitude of effects scenario: 22m viewer height**

Date: March 2019
Status: Final

Notes: An earth's radius of 7430km has been used to account for the combined effects the earth's curvature and light refraction



www.whiteconsultants.co.uk
Tel: 029 2236 2416

Key:

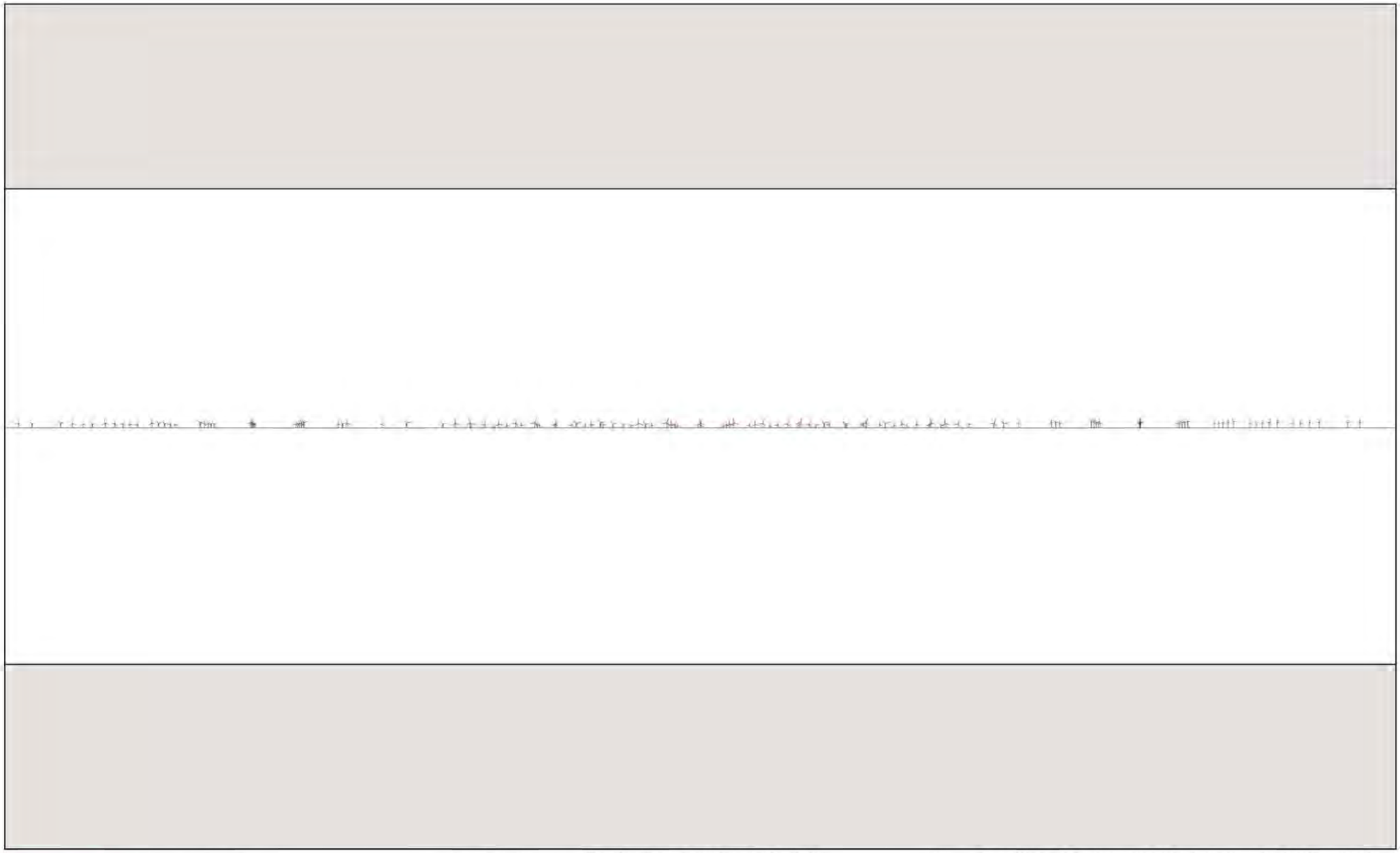
- 350m turbines
- 225m turbines
- 145m turbines

Viewing distance:	33cm for A3 sheet, 47cm for A2, 66cm for A1
Horizontal field of view:	Cylindrical Projection 70°
Distance to horizon:	9.4km
Turbine height to blade tip:	350m, 225m, 145m
Height to hub:	190m, 127.5m, 87.5m
Number of turbines:	70, 35, 35
Distance to turbines:	44.0km, 28.5km, 22.6km

Title: **Figure WS3: Low magnitude of effects scenario: 100m viewer height**

Date: March 2019
Status: Final

Notes: An earth's radius of 7430km has been used to account for the combined effects the earth's curvature and light refraction



www.whiteconsultants.co.uk
Tel: 029 2236 2416

Key:

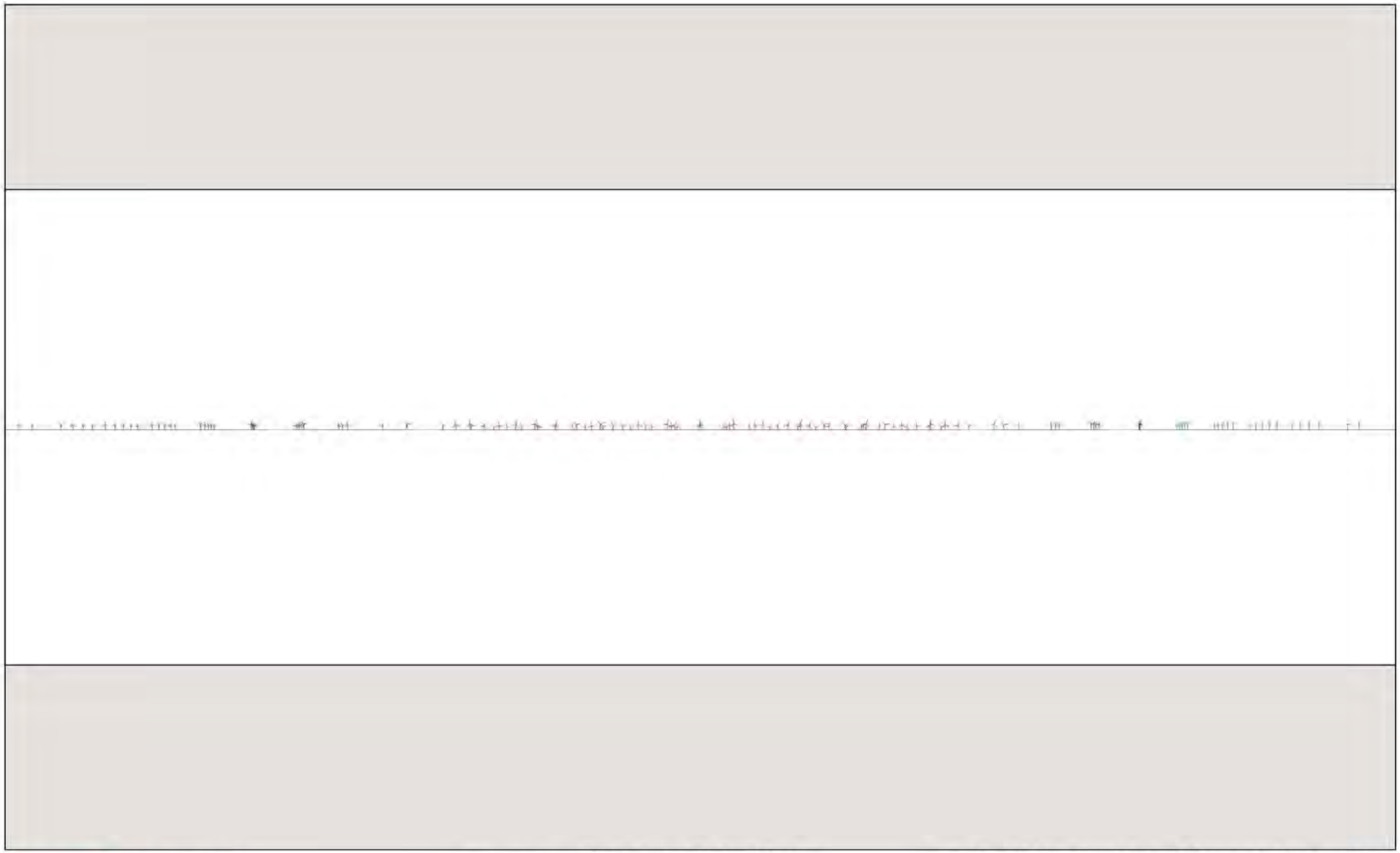
- 350m turbines
- 225m turbines
- 145m turbines

Viewing distance:	33cm for A3 sheet, 47cm for A2, 66cm for A1
Horizontal field of view:	Cylindrical Projection 70°
Distance to horizon:	9.4km
Turbine height to blade tip:	350m, 225m, 145m
Height to hub:	190m, 127.5m, 87.5m
Number of turbines:	70, 35, 35
Distance to turbines:	32.8km, 22.0km, 14.0km

Title: **Figure WS4: Medium magnitude of effects scenario: 6m viewer height**

Date: March 2019
Status: Final

Notes: An earth's radius of 7430km has been used to account for the combined effects the earth's curvature and light refraction



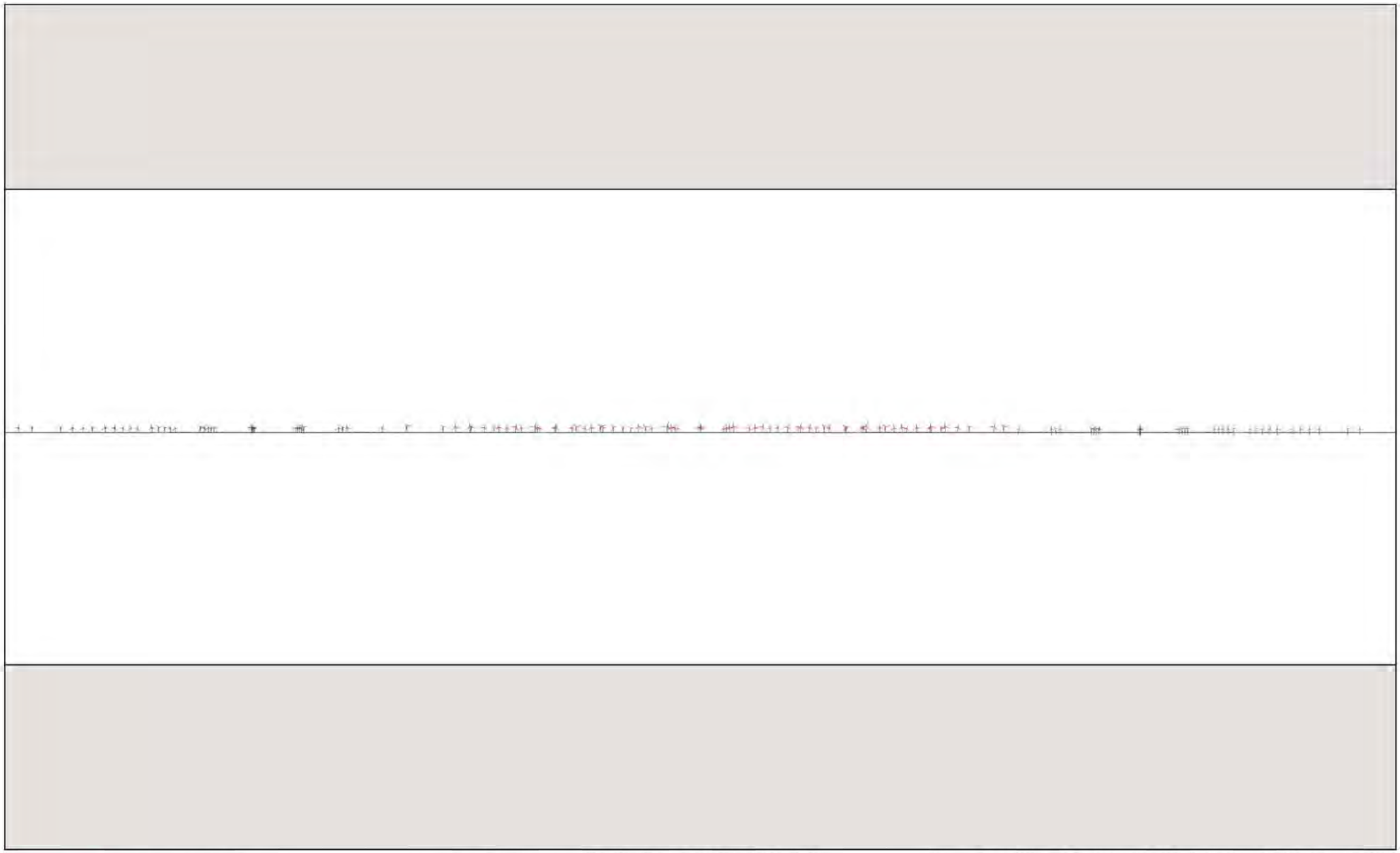
www.whiteconsultants.co.uk
Tel: 029 2236 2416

Key:

- 350m turbines
- 225m turbines
- 145m turbines

Viewing distance:	33cm for A3 sheet, 47cm for A2, 66cm for A1
Horizontal field of view:	Cylindrical Projection 70°
Distance to horizon:	9.4km
Turbine height to blade tip:	350m, 225m, 145m
Height to hub:	190m, 127.5m, 87.5m
Number of turbines:	70, 35, 35
Distance to turbines:	32.8km, 22.0km, 14.0km

Title:	**Figure WS5: Medium magnitude of effects scenario: 22m viewer height**
Date:	March 2019
Status:	Final
Notes:	An earth's radius of 7430km has been used to account for the combined effects the earth's curvature and light refraction



white CONSULTANTS
www.whiteconsultants.co.uk
Tel: 029 2236 2416

Key:
- 350m turbines
- 225m turbines
- 145m turbines

Viewing distance:	33cm for A3 sheet, 47cm for A2, 66cm for A1
Horizontal field of view:	Cylindrical Projection 70°
Distance to horizon:	9.4km
Turbine height to blade tip:	350m, 225m, 145m
Height to hub:	190m, 127.5m, 87.5m
Number of turbines:	70, 35, 35
Distance to turbines:	32.8km, 22.0km, 14.0km

Title: **Figure WS6: Medium magnitude of effects scenario: 100m viewer height**

Date: March 2019
Status: Final

Notes: An earth's radius of 7430km has been used to account for the combined effects the earth's curvature and light refraction

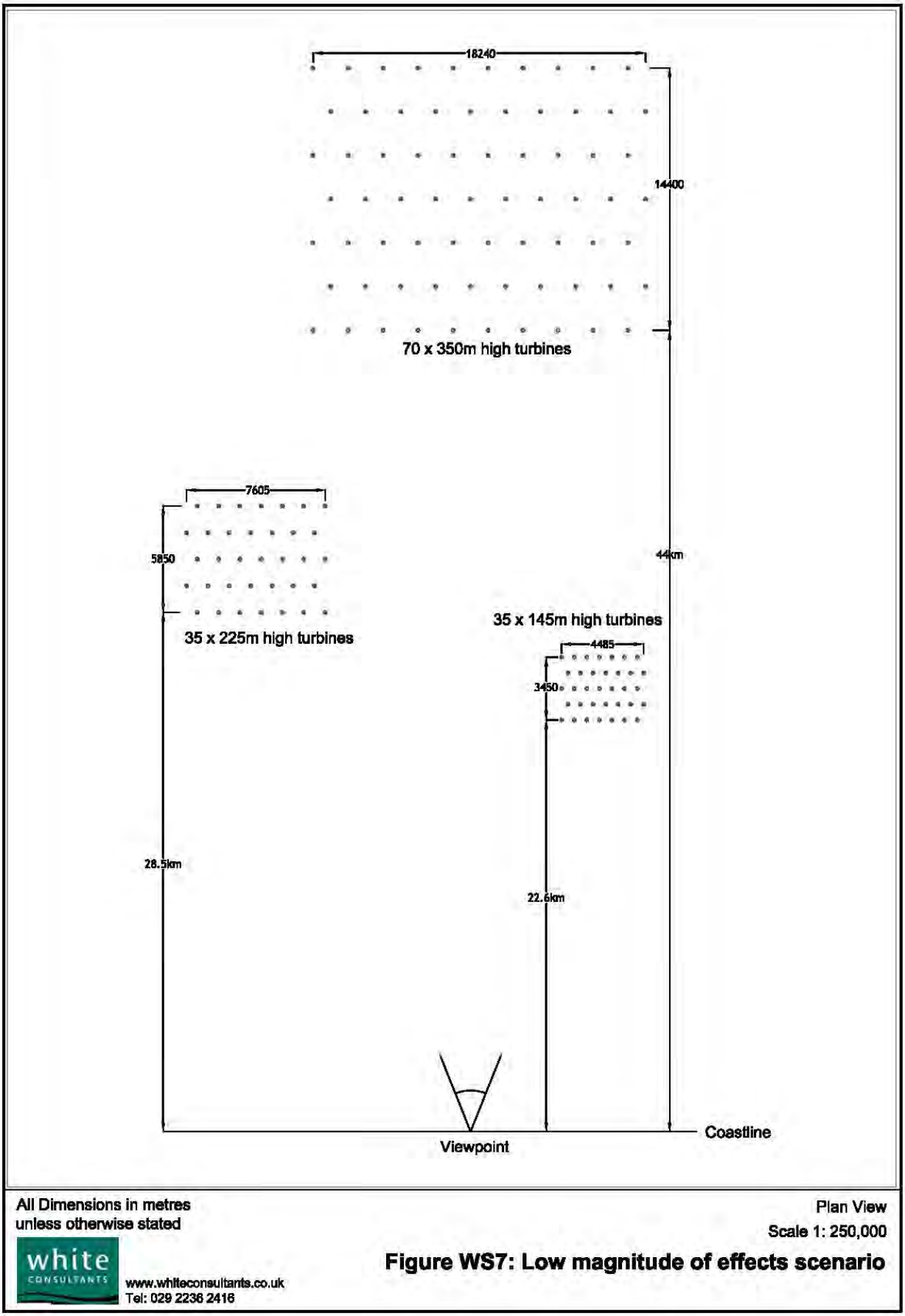
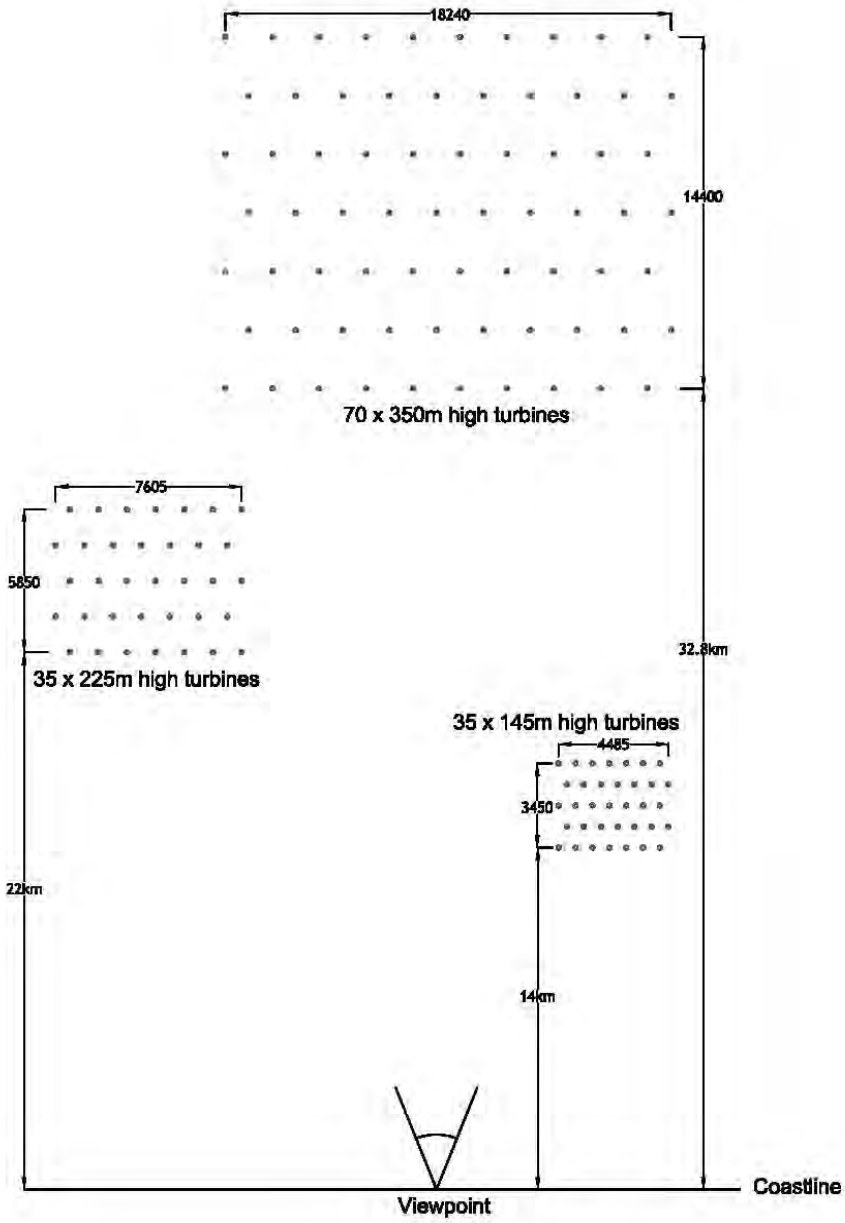


Figure WS7: Low magnitude of effects scenario



All Dimensions in metres
unless otherwise stated

Plan View
Scale 1: 250,000

white CONSULTANTS
www.whiteconsultants.co.uk
Tel: 029 2236 2416

Figure WS8: Medium magnitude of effects scenario

9. Exploration of examination and public inquiry findings

A number of offshore windfarms have been proposed or located with intervisibility with National Parks or AONBs. These have been considered at examination or public inquiry and the panel or inspectors have made comments about the visual effects and associated impact on the designations. A selection exploring a range of situations in England and Wales is discussed below.

9.1. Rampion

Rampion offshore windfarm was given development consent in July 2014. The development control order (DCO) specified that no turbine would exceed 210m above LAT or exceed a rotor diameter of 172m. The number of turbines was not specified but the extent of the windfarm was. The final approved layout extended around 13km by 6km.

The layout of the windfarm went through a number of iterations and three options were considered in the SVIA to determine a worst-case scenario (founded upon the 'Rochdale envelope' approach). These were for 3.6MW, 4 MW 165m to blade tip at close spacings and 7 MW 210m to blade tip turbines at wide spacings. The worst case was considered in the SVIA to be the 3.6 MW array because it extended further than the 4MW array but formed a denser array than the 7 MW option.

The windfarm is located to the south of Brighton. The South Downs National Park is located to the north beyond the urban area and only reaches the coast 20km to the north east.

The SVIA study area was formed on the basis that the development over 35 km would be unlikely to result in a perceptible change to seascape or landscape character. The SVIA stated that the magnitude of change to the character and setting of the National Park (and the Heritage Coast) as medium and the level/significance of effect as major/moderate. 10 of the 17 viewpoints associated with the National Park or Heritage Coast were stated as undergoing a major significance of effects. These were primarily oblique views along the coast looking at the narrower edge of the array. Most effects were agreed by the parties but the conclusions on how to act on these were not agreed.

Two options showing a reduced array were developed- Option F with 175 3.6MW (165m to blade tip) and Option D with 100 7MW turbines (210m to blade tip) (see extracts of photomontages in Figure 7.4 below). At the examination Natural England's evidence initially considered that Option D would be likely to be worse than Option F but at the hearing, put under some pressure to decide by the Examining Authority (ExA) panel, agreed that Option F did represent the worst case (Planning Inspectorate, 2014, 4.329). This was mainly due to the spread of turbines being considered to be more intrusive than the height. However, this spread was only apparent from the east, from the more sensitive receptors such as Cuckmere Haven where the National Park meets the Heritage Coast, rather than from the receptors to the north such as Brighton. Otherwise the main difference was the wider spacing between turbines of the larger turbine array, albeit with larger structures.

Whilst the National Park Authority considered that the effects could only be mitigated by removing the array altogether Natural England indicated that effects could be mitigated by locating it at a greater distance from the more sensitive parts of the National Park and Heritage Coast to the north east. There was discussion about the term 'remote' and Natural England stated, when pressed by the panel, that anything over 20km could be considered to be remote. By way of mitigation the applicant proposed a reduced array area and a 'structures exclusion zone' to the east increasing the distance from Cuckmere Haven beach from 17.5km to 20.2km, from Birling Gap from 19.6km to 22.8km and from Beachy Head from 23.3km to 25.8km. The level of significant effects were agreed to remain the same. Natural England stated that they believed that the revised array would still compromise and be in conflict with the National Park landscape/seascape objectives. However, when considered as part of a wider package of mitigation measures, the ExA panel concluded that the 20km structures exclusion zone would provide an important contribution to reducing the visual effect on the National Park and Heritage Coast (Planning Inspectorate, 2014, 4.356).

The size of array actually constructed is further still from the National Park/ Heritage Coast and uses a relatively small turbine of 3.45 MW 140m high.

Table 14 Rampion- Comparative photomontage extracts of views from Cuckmere Haven

Top image: Option F with 175 3.6MW turbines. Bottom image: Option D with 100 7MW turbines
Source: Rampion offshore wind farm: Additional visualisations of the array to include structures exclusion zone, E.On, 2013

9.2. Navitus Bay

Navitus Bay wind farm was refused consent in June 2015. The final application layout was for 194 x 5MW 165m high turbines or 121 x 8MW 200m high turbines.

This represented a reduction in size from the West of Wight Round 3 zone and the original layout option considered.

The SVIA study area was for up to 45 km from the array. The SVIA was prepared on the basis that the 8MW turbine option was the worst case due to the greatest theoretical extent of visibility. These were reduced to a 'turbine area mitigation option' (TAMO) of a maximum 105 turbines (if 6MW) during the course of the examination period (Planning Inspectorate, 2015, 7.4.5). The TAMO layout extended around 12.5km by 9.5km at its widest points.

The large number of national designations intervisible with the proposal were regarded by the ExA panel as fundamental to the balance of judgement. They focused their attention on the receptors held to contribute to the qualities for which the AONBs or National Park designations were founded (The Planning Inspectorate, 2015, 7.3.8). The designations were:

- Dorset AONB and associated Heritage Coast
- Isle of Wight AONB and associated Heritage Coast
- New Forest National Park

The TAMO extended the distance from these designated areas from the original proposal. These included the Dorset AONB and Purbeck Heritage Coast at Durlston Head from 14.3km to 18.8 km to the north west and St Adhelm's Head from 19km to 23.2 km; the Isle of Wight AONB and Heritage coast: Tennyson Coast at The Needles from 17.6 km to 21.9km to the north east; and the New Forest National Park at Hurst Castle from 22.9km to 27.1 km to the north east.

The TAMO SVIA found that there was a significant effect on only one stretch of designated coast (within Dorset AONB- Old Harry Rocks to St Adhelm's Head) with a medium effect on a high sensitivity receptor resulting in a major-moderate effect. Picking up from the Rampion examination, the applicant claimed that anything over 20 km could be classed as 'remote' and that significant impacts on receptors would not occur at this distance or above. The panel disagreed with both points in relation to the Navitus Bay proposal as each case had to be looked at its own merits and the context of the project was considered to be different from Rampion.

In relation to visual effects the ExA panel disagreed with the appellant's assessment to an extent considering that there were more significant effects (see Table 15 for detailed comparison). In addition, the panel considered that the array had a significant effect on a view from Hurst Castle in the New Forest National Park at a distance of 27km as it interfered with the view of the Needles.

In respect of effects on the Dorset AONB and related Heritage Coast the panel considered that the proposal would be an imposing feature affecting key qualities of tranquillity, remoteness and uninterrupted panoramic views. It would maintain a continuous presence in views along the exceptional undeveloped coastline (including views from 19-23.5 km) and cause significant harm to the core qualities of the AONB and the heritage coast and the way they are experienced (7.4.38).

In respect of the Isle of Wight AONB and related Tennyson Heritage Coast, the panel considered that significant harm would be largely confined to sub-area A1 of the AONB. However because of the relative proximity to distinctive features such as The Needles (22km) and Tennyson Monument (23km) and Down and the role they play in the wider visual experience of the AONB, the qualities of the designations would be unacceptably and significantly harmed.

In respect of the New Forest National Park the panel felt that there was a significant effect on the view from Hurst Castle. However, other views along the Solent Way were not considered significant and effects on the qualities of the National Park as a whole would not be significantly affected. This was agreed with the Natural England. This is not surprising as Hurst Castle is at the most southerly point of the Park and the majority of the Park is inland or orientated south-east towards the Solent.

9.3. Race Bank

The wind farm was given development consent in July 2012 by the Secretary of State without an inquiry. It was for 116 x 5MW wind turbines generating an output of upto 508MW. The development was located 27km offshore from the Norfolk Coast AONB at its nearest point.

The SVIA considered cumulative impacts of the proposed development alongside other offshore windfarms- Lynn and Dowsing, Lincs, Sheringham Shoal and the proposed Docking Shoal. It stated that the development would add a significant number of turbines into the seascape. The effects on Norfolk Coast AONB, when considered on its own and in conjunction with the other windfarms, was stated to be of minor significance on the coast reducing to negligible moving inland.

In response to concerns about visual impact the developer referred to the DTI BMT Cordah 2003 SEA report (mentioned earlier in this report) quoting 24km as a distance beyond which a low effect could be expected.

The Secretary of State concluded that cumulative visual impact of the proposed Development when viewed alongside other wind farm projects was not likely to be so significant that it required the Secretary of State to withhold consent for the Development.

Subsequent to this issue being raised the Developer amended the Original Application to reduce the proposed project in scale and gave a commitment to use a smaller number of larger turbines. The Secretary of State considered that these modifications together should have the effect of reducing the visual extent of the proposed Development.

9.4. Walney Extension

The windfarm was given development consent in August 2014. It was for upto 110 x 222m high 7MW turbines amounting to 750MW running north west from existing arrays at Walney 1 and 2 and West of Duddon Sands and with other windfarms such as Ormonde and Barrow closer to the coast. In addition, the oil and gas platform at

Douglas is in the area. The development was located 19km away from the Cumbrian coast at its nearest point and 25km to the Lake District National Park.

The SVIA considered that the individual effects on the main assessed viewpoint in the National Park at 28km (Black Combe, Bootle Fell) would be medium-low magnitude resulting in a major/moderate to moderate significance effect. Overall, the effects on the National Park were considered negligible. With regard to combined cumulative effects, the effect on Black Coombe was considered to be upto major/moderate, depending on the scenario. The cumulative effect on the National Park was considered to remain negligible.

The ExA panel visited the area including Black Combe when visibility was good to variable. They stated that their experience served to underline the influence of meteorological and atmospheric conditions in limiting visibility. They were in general agreement with the SVIA's predicted magnitude of impact and considered that the experience of Black Combe would be unlikely to be diminished due to the development.

9.5. Burbo Bank extension

The windfarm was given development consent in August 2015. It was for 36 x upto 223m high 7.5MW turbines running west from an existing array. The development is located 15km away from the northern edge of the Clwydian Range AONB at its nearest point. The highly linear and narrow AONB itself extends south beyond the 40km SVIA study area boundary.

The SVIA considered that the individual and combined cumulative effects on the nearest assessed viewpoint in the AONB at 18.43km (Craig Fawr) would be medium magnitude resulting in a major/moderate significance effect. The other viewpoint assessed, Moel Famau at 34.5km, was considered to undergo negligible effects. Overall, the effects on the AONB were considered negligible.

No specific instances of harm to the values of the AONB were raised in representations or evidence at the inquiry. The Inspector commented that he was satisfied that the proposal would be viewed from the northernmost extent of the AONB inland from Prestatyn and from upland outlooks in the Clwydian Range (4.133). However, these locations also provided views to other offshore wind farm developments and to substantial industrial and port development in Merseyside, Deeside and Cheshire. He considered that large areas of the AONB were affected by the application proposal to only the most minimal extent or not at all. In this context, he found that the purposes of the AONB designation would not be compromised by the application proposal.

10. Discussion and Conclusions

10.1. Background

Planning Policy Wales (PPW10) states that great weight should be given to the purposes of National Parks and AONBs including conserving and enhancing their natural beauty and their special qualities. This applies to both activities that lie within, or in the setting, of the designated area. Many of these designations in Wales are located on the coast and some of their most important special qualities relate to the setting provided by the sea. Some of the most sensitive locations are the far west peninsulas and islands.

The brief requires a visual effects ready reckoner showing the recommended distances from National Parks and Areas of Outstanding Natural Beauty (AONBs) in relation to different turbine heights.

10.2. Approach

The brief effectively requires the study to research and map buffers for different heights of turbines required to avoid significant adverse effects on high sensitivity coastal visual receptors. However, the significance of effect in SVIAs is a judgement made by assessors and will vary depending on a number of variables and criteria. Therefore this report takes the approach of using magnitude of change on visual receptors in SVIAs as the most consistent determinant of likely effects of offshore windfarms.

The range considered for the purposes of the brief is low and medium magnitudes of effect. Combined with a high sensitivity receptor a low magnitude of effect is likely to result in an effect of moderate significance. A medium magnitude of effect is likely to result in an effect of major moderate significance. Research and guidance indicate moderate can potentially be significant and major moderate is classified as significant in the vast majority of SVIAs.

The research has been carried out in order to maximise the number of relevant offshore windfarms and therefore the number of viewpoints assessed. It has not been limited to windfarms that may affect viewpoints within National Parks and AONBs. The SVIAs of 23 suitable windfarms have been analysed in England, Wales and Scotland's waters. Both the average and maximum distance for low and medium magnitude of effect have been recorded. Cumulative effects have also been noted and used where a windfarm is an extension to an existing large array.

The SVIA analysis only considers the effects of turbines up to 300m high due to the limited number of suitable SVIAs currently available for larger turbines. Therefore a wireframe analysis for 350m high turbines has been carried out.

The wireframe scenarios show an array of 350m high wind turbines in juxtaposition with arrays of 145m and 225m turbines viewed from 6m, 22m and 100m AOD. Comparing these, we have matched the 350m turbines to the 225m turbines height at the middle height of 22m AOD for both low and medium magnitude of effect

scenarios. In theory, the 350m high turbines at the located distance would potentially have a similar visual effect to the 225m turbines notwithstanding visibility modifiers.

10.3. Findings

The combined findings of the SVIA and wireframe analyses are as follows and are shown in Figures 3 and 4, and enlarged to focus on North Wales in Figures 5 and 6:

Table 16 Summary of distances at which low and medium magnitude of effect occur

Range of turbine heights to blade tip (m)	Low magnitude of effect		Medium magnitude of effect	
	Average Distance km	Maximum Distance km	Average Distance km	Maximum Distance km
107-145	22.6	27.3	14.0	15.0
146-175	24.4	26.5	18.8	20.8
176-225	28.5	32.0	22.0	26.7
226- 300	41.6	52.7	27.9	31.4
301-350	44.0	-	32.8	-

These distances need to be considered carefully for the following reasons:

- SVIAs are opinion of assessors, not necessarily statutory authority or third party reviewers.
- Taking an average of low and medium magnitude of effects means that the worst case is not taken. There is therefore potential for significant effects at these distances.
- Medium magnitude buffers are an indication that there is a likelihood of significant effects on a high sensitivity receptor for the size of wind turbine at, or less than, the distance stated. There is also potential for significant effects beyond.
- Low magnitude buffer distances are an indication that there is a likelihood that there are no significant effects on a high sensitivity receptor for the size of wind turbine at, or beyond, the distance stated. However, there are likely to be some effects beyond. The effects are not negligible.

10.4. Review of examinations and inquiries

A number of examinations and inquiries have been researched relating to offshore windfarms which are inter-visible with either National Parks or AONBs. Conclusions are:

- It is clear that Examining Authorities and Inspectors take the view that each case is considered on its own merit.
- Medium magnitude of effects leading to major/moderate significant effects are accepted as significant by Examining Authority panels and Inspectors.
- Factors which have been considered by Inspectors or Examining Authorities to reduce harm include a very limited number of views from designated areas, whether a designated area relates mainly to the land, and where there are significant developments such as power stations or urban areas located on the coast or offshore, such as existing offshore windfarms.
- Factors which have been considered to increase harm include where the designated areas affected have special qualities relating to the coast and sea, where wind farms are proposed directly off the coast of these designated areas,

where multiple designated areas are affected and where other factors such as visual overlapping of turbines (even with smaller sizes) are apparent.

10.5. Summary

In summary:

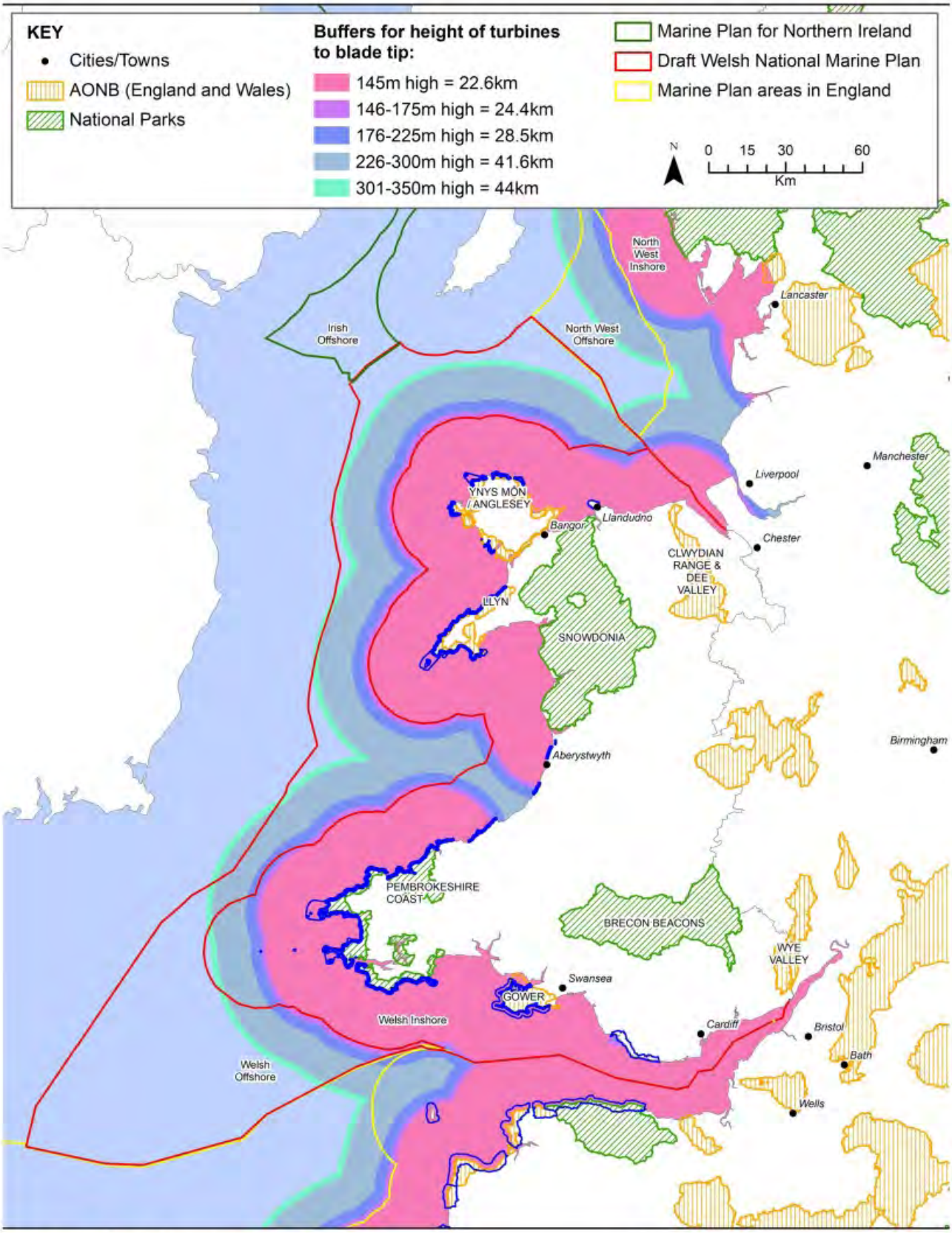
- This research indicates a relationship between the height of offshore wind turbines and the extent of visual effects.
- This is measured in terms of the magnitude of visual effects, which when combined with a high sensitivity visual receptor, indicate distances at which significant visual effects are likely.
- Distances representing the extent of low and medium magnitudes of visual effect reflect the extents of 'possible' and 'probable' significant visual effects on sensitive receptors occurring.
- The low magnitude of effect range of distances are more appropriate to use as a precautionary approach to avoiding significant adverse effects.
- A very approximate ratio between turbine height and distance for average low magnitude of effect is 1:133 and 1:100 for average medium magnitude of effect (so an array of 200m high turbines is likely to have a significant visual effect up to 20km distance).
- As the digest is understood to be the most comprehensive to date on this specific topic, it provides a reasonable basis for discussions about the extent of likely significant visual effects.
- This is on the basis that:
    - The digest of evidence relates to past cases for UK offshore wind turbines, in large arrays, at different heights and distances away.
    - The sensitive visual receptors used to define buffers in Wales are designated landscapes (National Parks and AONBs).
    - The evidence is in the form of a number of different professional judgements used in seascape and visual impact assessments (SVIAs) and/or at Public Inquiry
    - The SVIA judgements are based on more factors than only turbine height and distance away – but despite this, the digest indicates a pattern.
- As the specifics of each development and each sensitive visual receptor can vary, this digest must not be used to close down further discussion on a case by case basis.

The following should be taken into consideration:

- Not all AONBs and National Parks can be treated the same- their special qualities are important in understanding their relationship to the coast and related sea.
- Smaller turbines can have as large an effect as larger turbines depending on other factors such as extent and arrangement. Therefore, the medium magnitude of

effect range for turbines up to 175m high should be treated with caution as in some cases effects may be larger.

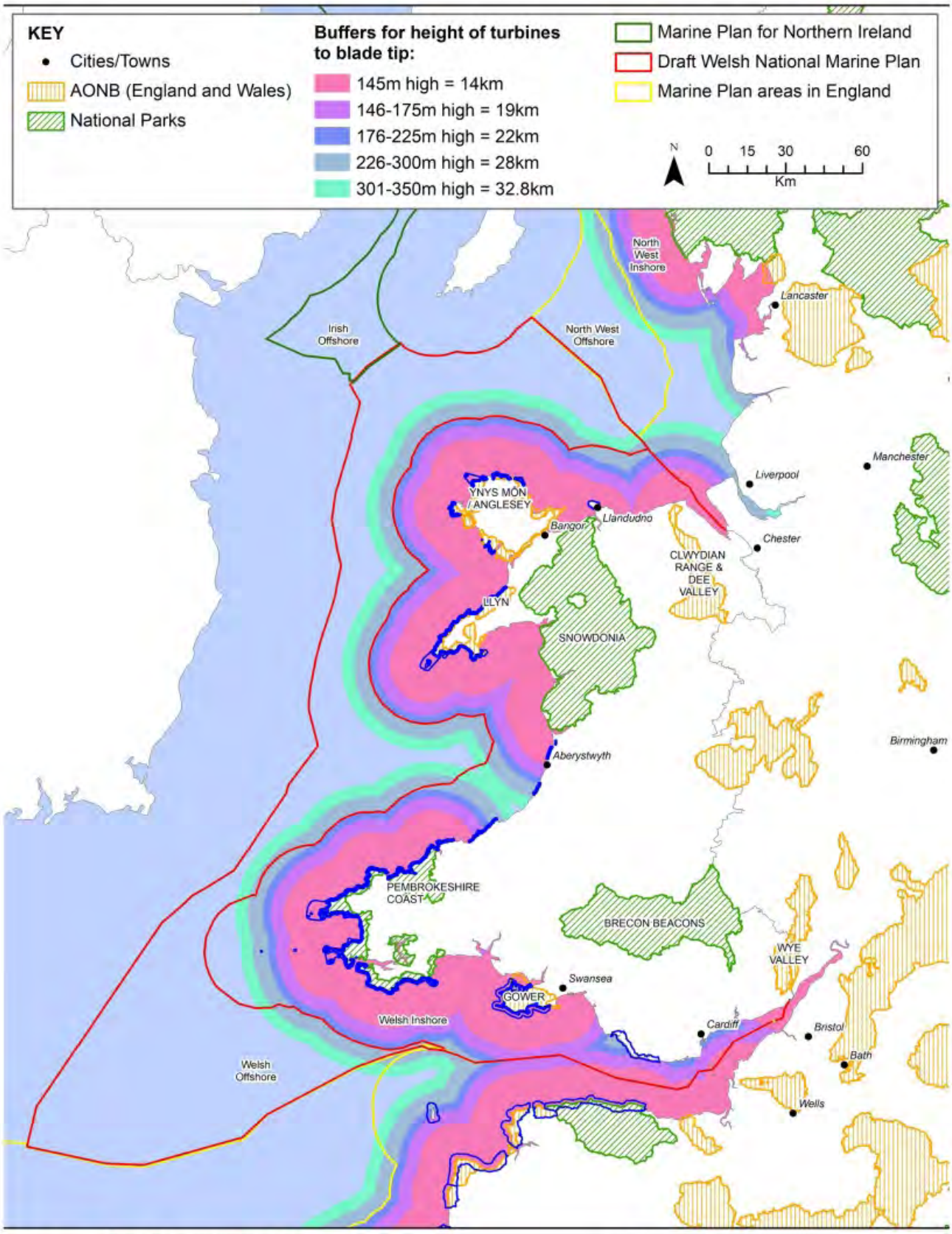
- Even low magnitude of effects do not mean that development is not visible. This may not be appropriate in the most sensitive situations where offshore windfarms are directly out to sea from designations and visible from many viewpoints and also off the western peninsulas and islands. In the more sensitive situations avoiding intervisibility and any adverse visual effects above negligible may be the preferred approach.
- Visual buffers based on turbine height should be considered as only part of seascape and visual impact. Other factors are explored in the Stage 2 and 3 reports.



www.whiteconsultants.co.uk

Figure 3
Buffers to National Parks and AONBs: Low magnitude of effect

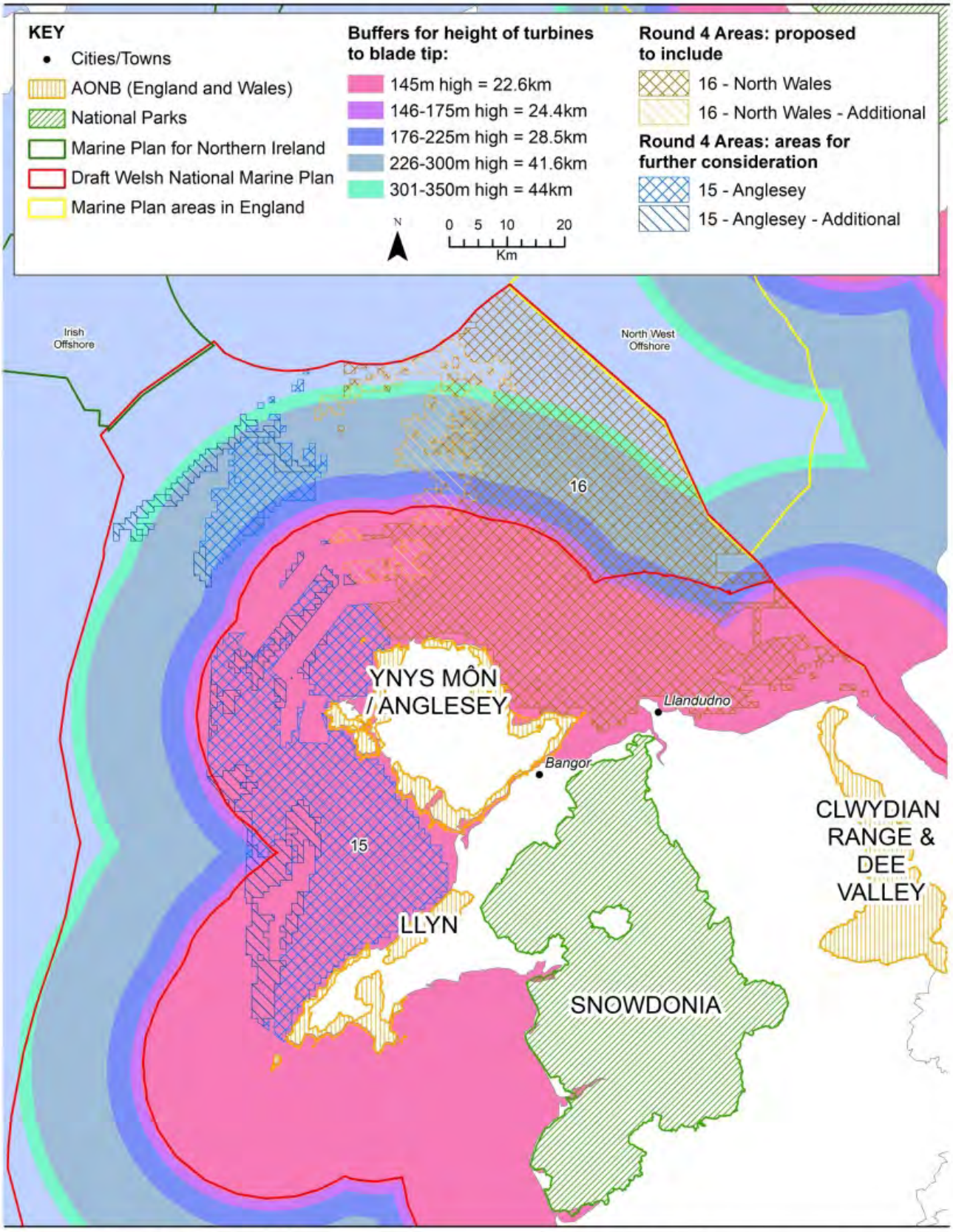
28/03/19 | v6 | Drawn: HK | Checked SW



www.whiteconsultants.co.uk

Figure 4
Buffers to National Parks and AONBs: Medium magnitude of effect

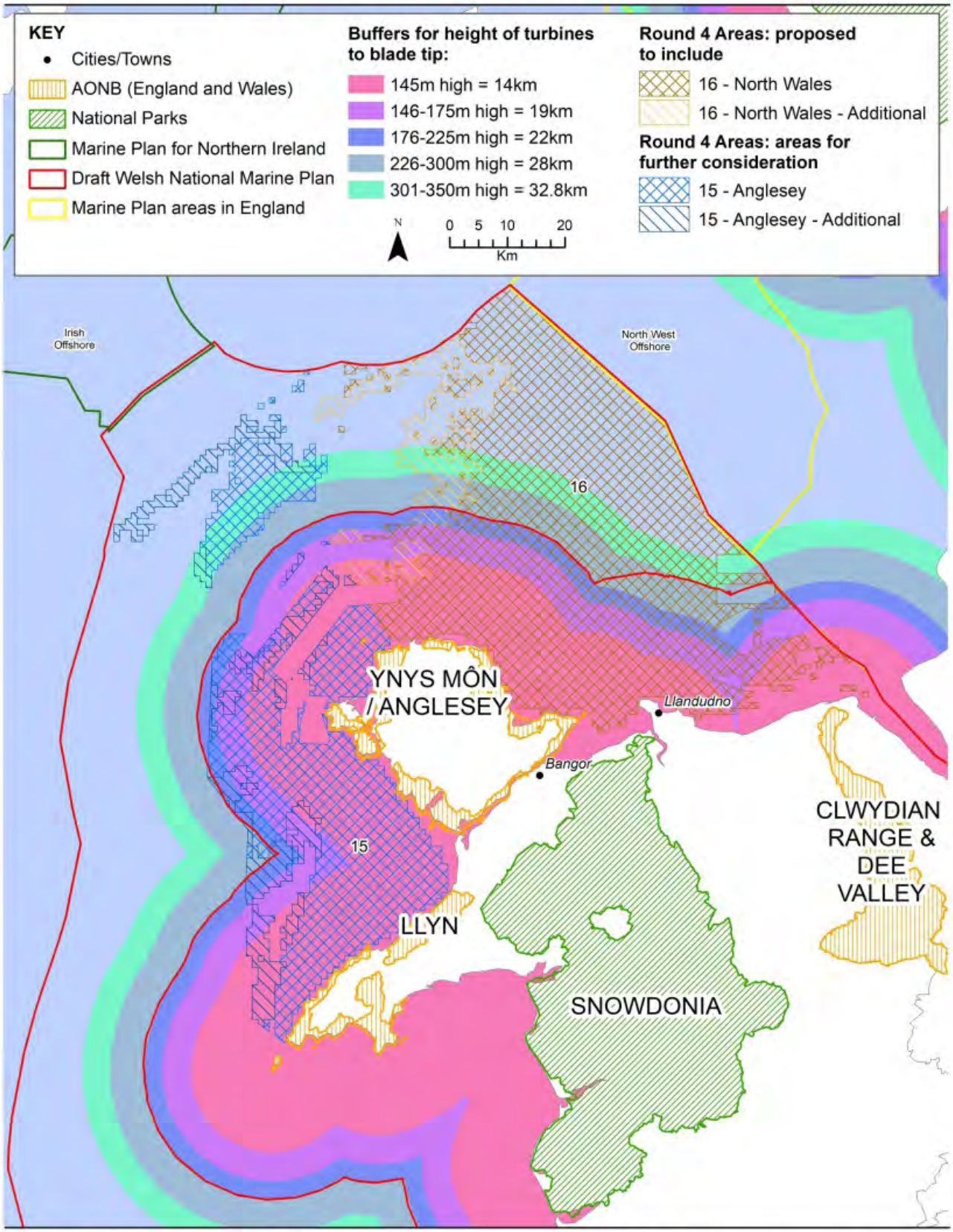
28/03/19 | v5 | Drawn: HK | Checked SW



www.whiteconsultants.co.uk

28/03/19 | v4 | Drawn: HK | Checked SW

Figure 5
Buffers to National Parks and AONBs off North Wales: Low magnitude of effect



www.whiteconsultants.co.uk

Figure 6
Buffers to National Parks and AONBs off North Wales: Medium magnitude of effect

28/03/19 | v3 | Drawn: HK | Checked SW

References

- Countryside Agency. 2002. Topic Paper 6: Techniques and criteria for judging capacity and sensitivity.
- Countryside Council for Wales. Briggs and White. 2009. Sensitivity of Welsh seascapes to offshore renewable energy developments (Countryside Council for Wales Policy Research Report number 08/5).
- DECC. March 2011. UK Offshore Energy Strategic Environmental Assessment 2.
- DECC. March 2016. UK Offshore Energy Strategic Environmental Assessment 3.
- DTI. 2005. Guidance on the Assessment of the Impact of Offshore Windfarms: seascape and visual impact report.
- DTI. BMT Cordah. 2003. Offshore With Energy Generation: Phase 1 proposals and environmental report.
- IEMA. 2011. IEMA Special Report – The state of environmental impact assessment practice in the UK.
- LI and IEMA. 2013. Guidelines for Landscape and Visual Impact Assessment. Edition 3. (GLVIA 3).
- Natural England. 2012. An approach to seascape character assessment. NECR 105.
- Scottish Natural Heritage. 2005. An assessment of the sensitivity and capacity of the Scottish seascape in relation to offshore windfarms (Scottish Natural Heritage commissioned report 103).
- Scottish Natural Heritage. March 2012. Offshore renewables-guidance on assessing the impact on coastal landscape and seascape.

11. Appendices

Appendix A: SVIA Analyses

Scheme name	Atlantic Array			
Document	Atlantic Array Offshore Wind Farm Draft ES Volume 1 Chapter 12			
Data source	RWE npower renewables			
Status	Withdrawn			

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW		1390	
No. of turbines		278	modelled on worst case scenario
Turbine blade tip height (m)		180	
Distance from nearest coast km		14	

Effect Note: only land-based viewpoints with small or medium MoE listed

No other windfarms present or proposed (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect (Magnitude of proposed change)	Significance of effect (daytime)
9 Caldey Island	27.5	High	Medium	Minor-moderate
18 Spaniard Rocks	28.0	High	Small	Minor
2 St Govan's head	28.0	Very high	Small	Moderate
23a Rhossili Downs	25.0	High	Medium	Moderate-major
26 Worms Head	23.5	Very high	Medium	Major-substantial
29 Port Eynon	24.0	High	Medium	Minor-moderate
3 Broad Haven	29.0	High	Small	Minor
34 Cefn Bryn	30.0	High	Small	Minor
35 Three Cliffs Bay	31.5	High	Small	Minor
36 Pwlldu Head	32.5	High	Small	Minor
37 Mumbles Head	37.5	High	Small	Minor
4 Stackpole Head	28.5	High	Small	Minor
54 Highveer Point	31.0	High	Small	Minor
55 Silkenworthy Knap	30.0	High	Small	Minor
56 Holdstone Down	28.0	High	Small	Minor
58 Little Hangman	24.5	Very high	Small	Minor
64 Capstone Point	19.0	High	Medium	Minor-moderate
66 Higher Slade	17.5	High	Medium	Minor-moderate
67 Lee Bay	16.5	High	Small	Minor
68 Bull Point	15.0	High	Medium	Minor-moderate
69 NW of Mortehoe	15.0	High	Medium	Minor-moderate
7 Manorbier	29.0	High	Small	Minor
70a Potters Hill	16.5	High	Small	Minor
71 Putsborough Sand	17.5	Very high	Medium	Moderate
72 Baggy Point	16.0	High	Medium	Minor-moderate
73 Saunton Down	19.5	High	Medium	Minor-moderate
74 Braunton Burrows	22.5	High	Small	Minor
75a Westward Ho	26.5	High	Small	Minor
77 Peppercombe	30.0	High	Small	Minor
78 Buck's Mills	30.0	High	Small	Minor
79 Clovelly Harbour	28.5	Very high	Small	Minor
8 Lydstep point	29.0	High	Small	Minor
82 Windbury Head	26.5	High	Medium	Minor-moderate
83 West Titchbury	25.5	High	Medium	Minor-moderate
90a Blegberry	27.5	Medium	Small	Minor
92 Bursdon Moor	33.0	High	Small	Minor
93 Embury Beacon	34.5	High	Small	Minor

Analysis	km
Max. distance where Low MoE occurred	37.5
Av. Distance where Low MoE occurred	28.5
Max. distance where Medium MoE occurred	27.5
Av. distance where Medium MoE occurred	20.0

low = small

Combined Cumulative Effect No other windfarms present or planned

Scheme name	Beatrice Offshore Wind Farm		
Document	E S Section 14 Wind Farm Seascape, Landscape and Visual April 2012		
Data source	http://www.marinedataexchange.co.uk		
Status	Under construction		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	588		
No. of turbines	83	142	
Turbine blade tip height (m)		198.4	
Distance from nearest coast km	22		

Effect

No other windfarms present or taken into consideration (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect	Significance of effect
1 Duncansby Head	36.74	High	Low to negligible	Moderate to negligible
2 Keiss Pier	27.35	High medium to low	Low to negligible	Moderate to negligible (residents)
3 Sortat	32.49	High	Negligible to none	Negligible to none
4 Wick Bay	18.04	High	Medium	Major to Moderate
5 Sarclet	13.93	High (residents)	High	Major (Residents)
6 Hill O Many Stanes	16.78	High to medium	High	Major to major-moderate
7 Lybster	19.27	High	High to medium	Major to major-moderate
8 Latheron A9	22.98	Medium to low	Medium	Moderate to moderate-minor
9 Dunbeath	25.62	High (residents)	Medium	Major to moderate (residents)
10 Whailgoe Steps	33.06	High (residents)	High	Major (residents)
11 Scaraben	33.06	High	Low	Moderate
12 Navidale	38.05	High medium to low	Low to negligible	Moderate-minor
13 Catchory	29.48	High medium (residents)	Negligible	Negligible
14 Minor Rd Stemster Hill	26.28	Medium to low	Medium to low	Moderate to minor
15 Aberdeen-Orkney Ferry route	19.73	Medium to low	Low to none	Moderate-minor
16 Aberdeen-Orkney Ferry route	29.74	Medium to low	Low to none	Moderate-minor

Analysis	km
Max. distance where Low MoE occurred	33.06
Av. Distance where Low MoE occurred	33.06
Max. distance where Medium MoE occurred	25.62
Av. distance where Medium MoE occurred	22.21

Combined Cumulative Effect

Combined cumulative effect with other windfarms, either existing or proposed (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect (Magnitude of impact)	Significance of effect (Significance of impact)
1 Duncansby Head	36.74	High	Negligible	Negligible
2 Keiss Pier	27.35	High medium to low	Low to negligible	Moderate to negligible (residents)
3 Sortat	32.49	High	Negligible to none	Negligible to none
4 Wick Bay	18.04	High	None	None
5 Sarclet	13.93	High (residents)	Low	Moderate
6 Hill O Many Stanes	16.78	High to medium	Medium	Major to Moderate
7 Lybster	19.27	High	Low	Moderate
8 Latheron A9	22.98	Medium to low	Low	Moderate-minor to minor
9 Dunbeath	25.62	High (residents)	Medium	Major-moderate (residents)
10 Whailgoe Steps	33.06	High (residents)	Low	Moderate (residents)
11 Scaraben	33.06	High	Low	Moderate to moderate-minor
12 Navidale	38.05	High medium to low	Low to negligible	Moderate to negligible (residents)
13 Catchory	29.48	High medium (residents)	High-Medium	Negligible
14 Minor Rd Stemster Hill	26.28	Medium to low	Medium to low	Moderate to minor

Analysis (cumulative)	km
Max. distance where Low MoE occurred	33.06
Av. Distance where Low MoE occurred	24.46
Max. distance where Medium MoE occurred	25.62
Av. distance where Medium MoE occurred	21.20

Scheme name	Burbo Bank Offshore Extension Wind Farm		
Document	ES Volume 2 - Chapter 20: Seascape, Landscape and Visual Impact Assessment March 2013 p 49-71		
Data source	http://infrastructure.planninginspectorate.gov.uk/projects/north-west/burbo-bank-extension-offshore-wind-farm/		
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	254		
No. of turbines	32	36	
Turbine blade tip height (m)	187	141-223	
Distance from nearest coast km	7		

Effect

Additional effect to other existing windfarms as part of baseline (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect	Significance of effect
1 Leasowe Common	7.91	High	High-medium	Major-moderate
2 Hoylake, Near Hilbre Point	8.41	High	High-medium	Major-moderate
3 Crosby Coastguard Station	9.85	High (residents & visitors)	Low	Moderate
4 Fort Perch Rock, New Brighton	11.01	Medium (visitors)	Medium	Moderate
5 Formby - Beach	11.18	High	Medium	Moderate
6 Point of Ayr	12.25	High	High-medium	Major-moderate
7 Thurstaston Common	13.36	High	Medium	Moderate
8 Gwespyr	14.41	High	Medium	Major-moderate
9 Prestatyn (near Nova Centre)	15.33	Medium	Medium	Moderate
10 Craig Fawr, Clywdian Range	18.43	High	Medium	Major-moderate
11 Clieves Hill	20.31	High (residents & visitors)	Low	Moderate
12 Southport Pier	21.99	High (visitors)	Medium	Moderate
13 Pensarn/ Abergele	26.40	Medium (visitors)	Low	Moderate-minor
14 Moelfre Isaf	30.06	High (walkers)	Low	Moderate
15 St Anne's Pier	30.22	Medium (visitors)	Low-negligible	Negligible
16 Starr Gate, Blackpool	32.68	High (residents)	Low-negligible	Negligible
17 Moel Famau, Clwydian Range	24.53	High (walkers)	Negligible	Negligible
18 Great Ormes Head	37.80	High (visitors)	Negligible	Negligible

Analysis	km
Max. distance where Low MoE occurred	30.6
Av. Distance where Low MoE occurred	21.7
Max. distance where Medium MoE occurred	22.0
Av. distance where Medium MoE occurred	15.1

Combined Cumulative Effect

Combined cumulative effect with other windfarms, either existing or proposed (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect (Magnitude of change)	Significance of effect (Predicted impact)
5 Formby - Beach	11.18	High	Medium	Moderate
6 Point of Ayr	12.25	High	High-medium	Major-moderate
10 Craig Fawr, Clywdian Range	18.43	High	Medium	Major-moderate
13 Pensarn/ Abergele	26.40	Medium (visitors)	Low	Moderate-minor
17 Moel Famau, Clwydian Range	24.53	High (walkers)	Negligible	Negligible

Analysis (cumulative)	km
Max. distance where Low MoE occurred	26.40
Av. Distance where Low MoE occurred	26.40
Max. distance where Medium MoE occurred	18.43
Av. distance where Medium MoE occurred	14.81

Scheme name	Docking Shoal Offshore Wind Farm Development			
Document	Seascape and Visual Assessment October 2007 p 51+			
Data source	http://www.marinedataexchange.co.uk			
Status	Withdrawn			

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	540		
No. of turbines		177 (worst case)	
Turbine blade tip height (m)		145	
Distance from nearest coast km	14		

Effect

Additional effect to other existing windfarms as part of baseline (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (sensitivity to change)	Magnitude of effect (Magnitude of operational visual effect)	Significance of effect (Effect significance)
1 Chapel St Leonards	22.90	medium to low	low	minor to moderate
2 Skegness	20.30	low to medium	low to medium	minor to moderate
3 Gibraltar Point	22.10	medium to low	low	minor to moderate
4 Candlebury Hill	31.60	low	negligible	negligible
5 St Edmunds Point	24.80	medium to low	low to medium	moderate to minor
6 Brancaster Bay	19.10	medium	medium	moderate
7 Blakeney Point	17.60	medium to high	medium to low	moderate
8 Docking	26.30	low to medium	low	minor

Analysis	km
Max. distance where Low MoE occurred	31.6
Av. Distance where Low MoE occurred	31.6
Max. distance where Medium MoE occurred	19.1
Av. distance where Medium MoE occurred	19.1

Combined Cumulative Effect

Combined cumulative effect with other windfarms, either existing or proposed (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect (magnitude of cumualtive effects)	Significance of effect (Significance of impact)
1 Chapel St Leonards	22.90	medium to low	low	minor
6 Brancaster Bay	19.10	medium	medium to high, to low	Moderate to major, to minor or negligible
7 Blakeney Point	17.60	medium to high	medium to high, to low	Moderate to major, to minor or negligible

Analysis (cumulative)	km
Max. distance where Low MoE occurred	22.90
Av. Distance where Low MoE occurred	22.90
Max. distance where Medium MoE occurred	n/a
Av. distance where Medium MoE occurred	n/a

Scheme name	Greater Gabbard		
Document	Greater Gabbard Offshore Wind Farm ES - SLVIA Chapter 10.3		
Data source	https://tethys.pnnl.gov/publications/greater-gabbard-offshore-wind-farm-environmental-statement, 4COffshore		
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	504		
No. of turbines	140	141	
Turbine blade tip height (m)	131	170	
Distance from nearest coast km	23		

Effect

No other windfarms taken into consideration (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect (Magnitude of change - worst case)	Significance of effect (Significance of impact)
VP1 Orford Castle	28.00	High	Moderate-substantial	Not significant
VP2 Old Felixstowe Seafront	33.50	High	Moderate-substantial	Not significant
VP3 Aldeburgh seafront	29.00	High	Substantial	Not significant
VP4 North of Alderton	32.50	Moderate	Moderate-substantial	Not significant
VP5 Orford Ness nr lighthouse	25.00	High	Substantial	Not significant
VP6 Shingle Street	30.50	High	Moderate-substantial	Not significant

Analysis	km	
Max. distance where Low MoE occurred	n/a	
Av. Distance where Low MoE occurred	n/a	
Max. distance where Medium MoE occurred	33.50	includes moderate-substantial
Av. distance where Medium MoE occurred	31.00	includes moderate-substantial

Combined Cumulative Effect Chapter 10.5 indicates very limited effects, minor or none

Scheme name	Gunfleet Sands 2		
Document	Gunfleet Sands 2 Offshore Wind Farm Environmental Statement 2007 Section 12		
Data source	https://tethys.pnnl.gov		
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	173		
No. of turbines	22		extension to Gunfleet 1 - as built 48 in total
Turbine blade tip height (m)	128		
Distance from nearest coast km	8.5		

Effect

Other windfarms present or planned are taken into consideration (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity to change)	Magnitude of effect (Magnitude of change)	Significance of effect
Cliff top, The Naze	13	Medium - low	Medium - low	Moderate - Minor
Greensward, Frinton-on-Sea	9.5	Medium - low	Medium - low	Moderate - Minor
Public Footpath, Great Holland	10	Medium - low	Medium - low	Moderate - Minor
Radar Tower, Holland Haven	8.3	Medium - low	Medium - low	Moderate - Minor
Seafront Promenade, Clacton-on-Sea	8.9	Low	Low	Minor
Sea Defence, Seawick	10.1	Low	Low	Minor
Beach at West Mersea	19.6	Medium - low	Low	Minor
Bradwell Bird Observatory	17.5	Medium	Low	Minor - Moderate

Analysis	km
Max. distance where Low MoE occurred	19.6
Av. Distance where Low MoE occurred	14.0
Max. distance where Medium MoE occurred	n/a
Av. distance where Medium MoE occurred	n/a

Combined Cumulative Effect

No viewpoint data

12.7.9

The cumulative magnitude of effect of the Round 1 offshore wind farms with the GS2 development is therefore considered to be Low. When combined with a generally Low - Medium sensitivity to change to the GS2 development the significance of cumulative effect is considered to be Minor with the generally open exposed and remote foreshore areas providing some capacity for change. The cumulative impact is then generally reduced further inland and to the north.'

Scheme name	Gwynt y Mor		
Document	Gwynt y Môr Offshore Wind Farm Environmental Statement Chapter 10		
Data source	https://tethys.pnnl.gov/		
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	576		
No. of turbines	160		
Turbine blade tip height (m)	140		
Distance from nearest coast km	18		

Effect

Additional effect to other existing windfarms as part of baseline (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect (Magnitude of impact)	Significance of effect (Significance of impact)
Bull Bay	42.3	Moderate	Negligible	Insignificant
Point Lynas	37.1	Moderate to High	Negligible	Slight
Mynydd Eilian	38	Moderate to High	Negligible	Slight
Moelfre Headland	35	Moderate to High	Negligible	Slight
Ref Wharf Bay	35.9	Moderate to High	Negligible	Slight
Bwrdd Arthur	30.9	Moderate to High	Small	Slight to Moderate
Penmon Point	28	Moderate to High	Small	Slight to Moderate
Beaumaris	32.2	Moderate	Small	Slight
Bangor Pier	35.8	Low to Moderate	Small	Insignificant
Carnedd Llywelyn	36.7	High	Negligible	Slight
Llanfairfechan	27.8	Moderate	Negligible	Insignificant
Conwy Mountain	21.4	Moderate to High	Small to Medium	Moderate
Great Orme Summit	16.2	Moderate to High	Small to Medium	Moderate
Great Orme Summit	15.8	Moderate to High	Small to Medium	Moderate
Great Orme Rest and Be Thankful	16	Moderate to High	Small to Medium	Moderate
Llandudno Promenade monument	16.2	Moderate	Medium to Large	Moderate to Substantial
Llandudno Promenade conf centre	16.2	Moderate	Medium to Large	Moderate to Substantial
Landudno Promenade Paddling Pool	15.7	Low to Moderate	Medium to Large	Moderate
Rhos-on-Sea	14.3	Low to Moderate	Medium	Slight to Moderate
Bryn Euryn	15.7	Moderate	Small to Medium	Slight to Moderate
Mynydd Marian	15.3	Low to Moderate	Medium	Slight
Abergale (Pensarn Station)	13.9	Low	Medium to Large	Slight to Moderate
Rhyl Aquarium	13.1	Low	Medium to Large	Slight to Moderate
Graig Fawr	15.9	Moderate to High	Small to Medium	Moderate
Prestatyn Nova Centre	12.7	Low	Medium	Slight
Gwaenysgor	14.9	Low to Moderate	Medium	Slight to Moderate
Point of Ayr	14.6	Moderate	Small to Medium	Slight to Moderate
Thurstaston Common	24.5	Moderate to High	Small	Slight to Moderate
Grange Hill	21.1	Moderate	Small	Slight
Hilbre Point	19.1	Moderate	Small to Medium	Slight to Moderate
New Brighton	25.7	Low	Small	Insignificant
Crosby	28	Low	Small	Insignificant
Formby Point	26.4	Moderate to High	Small	Slight to Moderate
Southport Pier	37	Low	Negligible	Insignificant
Snowdon Summit	54.9	High	Negligible	Insignificant
Blackpool Tower	47.7	Low	Negligible	Insignficant

Analysis	km
Max. distance where Low MoE occurred	35.8
Av. Distance where Low MoE occurred	28.0
Max. distance where Medium MoE occurred	15.3
Av. distance where Medium MoE occurred	14.3

Combined Cumulative Effect

Chapter 12.6 16 not found online

Scheme name	Hywind Scotland Pilot Park		
Document	Hywind Scotland Pilot Park Environmental Statement -SLVIA March 2015 Statoil		
Data source	http://www.statoil.com/en/EnvironmentSociety/Environment/impactassessments/NewEnergy/IntWind/Pages/HywindScot		
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	30		
No. of turbines	5	5	
Turbine blade tip height (m)	159-178		
Distance from nearest coast km	23		

Effect

No other windfarms present or taken into consideration (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (senitivity of viewpoint)	Magnitude of effect	Significance of effect (level of impact)
1 Scotstown Head	26.0	High	Minor	Minor
2 Gable Braes, Peterhead	23.0	High	Minor	Minor
3 Slains Castle Car Park	26.0	Medium	Minor	Minor
4 Near A950 Thunderton	29.0	Medium	Minor	Minor
5 Peterhead Bay	25.4	Medium/high	Minor	Minor
6 Reform Tower	25.6	Medium/high	Minor	Minor
7 Stirling Hill	26.2	Medium/high	Minor	Minor

Analysis	km
Max. distance where Low MoE occurred	29.00
Av. Distance where Low MoE occurred	25.89
Max. distance where Medium MoE occurred	n/a
Av. distance where Medium MoE occurred	n/a

note Low taken to be 'Minor', Medium taken as 'Moderate'

Combined Cumulative Effect no data found

In ES:

Subject to the exact extent and configuration of the ZTVs for these developments, a degree of cumulative and in combination impact may potentially occur relating to simultaneous or successive visibility. However, due to the low magnitude of change relating to any visibility should it occur, deriving from the very long separation distances both between the developments under consideration, and between each development and the receptors being assessed, it is not considered that any of these would result in a significant effect.

Scheme name	Inch Cape			
Document	ES Human Environment Chapter 12 7 Appendix 12 C			
Data source	http://www.inchcapewind.com			
Status	Consented			

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW		1000	
No. of turbines		40 - 72	
Turbine blade tip height (m)		291	
Distance from nearest coast km	15		

Effect

Additional effect to other existing windfarms as part of baseline (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity of visual receptor)	Magnitude of effect (Magnitude of change)	Significance of effect (Effect on visual amenity)
1 Garron Point	43.7	High	Low	Minor/moderate
5 Montrose	20.0	High	High	Major
6 Braehead of Lunan	19.5	High	High	Major
9 Minor Road S of Cairnconon Hill	27.0	Moderate	High	Moderate/major
10 Clifftop Path N of Victoria Park	18.6	High	High	Moderate/major
11 Arbroath Signal Tower	19.7	High	High	Moderate/major
4 Cairn o' Mount	42.9	High	Low	Minor/moderate
8 White Caterthun Hill Fort	38.8	High	Low	Moderate
13 Dodd Hill	38.0	High	Low	Minor/moderate
15 Dundee Law	43.7	High	Low	Moderate
17 Strathkinness	39.4	High to moderate	Low	Minor/moderate
19 Largo Law	48.4	High	Low	Minor/moderate
20 B9131 South of Dunino	36.2	Moderate	Low	Minor/moderate
22 Anstruther Easter	36.4	High	Low	Moderate
26 North Berwick Law	52.50	High	Low	Moderate/major
2 A92, North of Inverbervie	30.0	High to moderate	Medium	Moderate/major
3 Beach Road, Kirkton	24.1	High	Moderate	Moderate/major
12 A92 East of Muirdrum	25.2	High to moderate	Moderate	Moderate/major
14 Carnoustie	26.7	High	Moderate	Moderate
16 Tentsmuir	33.4	High	Moderate	Moderate/major
18 St Andrews, East Scores	34.8	High	Moderate	Moderate/major
21 Kingsbarns	30.6	Moderate	Moderate	Moderate
23 Fife Ness, Lochaber Rock	28.32	High	Moderate	Moderate/major
24 Isle of May	34.40	High	Moderate	Moderate/major
7 Brechin	31.7	Moderate	Negligible	Negligible
25 Dunbar	51.00	High	Negligible	Minor/moderate

Analysis	km
Max. distance where Low MoE occurred	52.40
Av. Distance where Low MoE occurred	34.77
Max. distance where Medium MoE occurred	34.80
Av. distance where Medium MoE occurred	29.72

Includes medium and moderate

Combined Cumulative Effect

There are no parts of the study area where the Inch Cape WTGs will be visible only with these two application and scoping stage wind farms, which would only be seen in the south west part of the study area. In this context and particularly given the considerable distance between these two proposed wind farms, it is considered that the effects of the Inch Cape WTGs and OSPs with the baseline of operational and consented wind farms and these two proposed wind farms, would be no greater than the effects assessed for Inch Cape with the operational and consented developments included in the assessment.'

Scheme name	Kentish Flats		
Document	Kentish Flats Environmental Statement 8.5.10		
Data source	GREP UK		
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	90		
No. of turbines	30		
Turbine blade tip height (m)	115	140	
Distance from nearest coast km	8		

Effect

No other windfarms present or taken into consideration (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect (Magnitude of change)	Significance of effect (Significance of change)
1 St Peters Chapel	30.9		Negligible	Moderate/Minor
2 Pier at Southend-on-Sea	23.7		Slight	Moderate/Minor
3 Warden	12.1		Moderate	Moderate
4 Whitstable (Tankerton)	9.6		Substantial	Major/Moderate
5 Whitstable (Bayview Hill)	12		Moderate	Moderate
6 Herne Bay Museum	8.7		Substantial	Major/Moderate
7 Margate	18.8		Slight	Moderate/Minor
8 North Downs Way	26.9		Slight	Moderate/Minor
9 Shoeburyness	19		Slight	Moderate/Minor
10 Thanet, A256 neat Westwood	20.6		Slight	Minor
11 Reculver / Saxon Shore Way	9.5		Moderate	Major/Moderate
12 Sheerness	20.5		Slight	Moderate/Minor
13 Faversham	18.5		Slight	Minor

Analysis	km
Max. distance where Low MoE occurred	27.9
Av. Distance where Low MoE occurred	21.1
Max. distance where Medium MoE occurred	12.1
Av. distance where Medium MoE occurred	11.2

Combined Cumulative Effect p 100

Combined cumulative effect with other windfarms, either existing or proposed (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect (Magnitude of cumulative change)	Significance of effect (Cumulative effects)
1 St Peters Chapel	30.9	High	Slight	Moderate/minor

Analysis (cumulative)	km
Max. distance where Low MoE occurred	30.90
Av. Distance where Low MoE occurred	30.90
Max. distance where Medium MoE occurred	n/a
Av. distance where Medium MoE occurred	n/a

Slight assessed as Low

Scheme name	London Array Offshore Phase 1		
Document	ES Landscape Seascape and Visual Assessment Appendix 5.1		
Data source	http://marinedataexchange.co.uk		
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	630		
No. of turbines	175	up to 271	
Turbine blade tip height (m)	147	175	
Distance from nearest coast km	21		

Effect

Additional effect to other existing windfarms as part of baseline (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect (Magnitude of impact)	Significance of effect (Significance of impact)
Deal	40	High	None	None
North Foreland	22	High	Low to Negligible	Negligible
Margate - Cliftonville/Palm Bay	21	High	Low	Slight Adverse
Margate - Walpole Bay	21	High	Low	Slight Adverse
Chislet / West Thanet	27	Low	Low to Negligible	Negligible
Reculver	27	High	Low to Negligible	Negligible
Herne Bay	31	High	Negligible	Negligible
Whitstable	34	Medium	Negligible	Negligible
Swale	44	High	None	None
Shoeburyness	40	Medium	Negligible	Negligible
Shoebury Ness	36	Medium	Negligible	Negligible
Burnham on Crouch	40	Medium	Negligible	Negligible
Blackwater Estuary	40	Medium	Negligible	Negligible
Clacton-on-Sea	24	Medium	Low to Negligible	Negligible
Holland-on-Sea	24	Medium	Low to Negligible	Negligible
Naze Tower	24	Medium	Low to Negligible	Negligible
Harwich Seafront	31	Medium	Negligible	Negligible
Felixstow Seafront	31	Medium	Negligible	Negligible

Analysis	km
Max. distance where Low MoE occurred	21.0
Av. Distance where Low MoE occurred	21.0
Max. distance where Medium MoE occurred	n/a
Av. distance where Medium MoE occurred	n/a

Combined Cumulative Effect no data found

ES ordered from marine data exchange but download failed

Scheme name	Moray East		
Document	ES Chapter 8.4		
Data source	morayoffshore.com		
Status	Under construction		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	1116		
No. of turbines	186		
Turbine blade tip height (m)	204		
Distance from nearest coast km	22		

Effect

No other windfarms present (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect (Magnitude of change)	Significance of effect (Significance of residual effects)
1 Duncansby Head	42.00	Medium-high	Low	Not significant
2 Keiss Pier	35.00	Medium-high	Low	Not significant
3 Sortat	40.00	Medium-low	Low-negligible	Not significant
4 Wick Bay	26.00	Medium-high	Medium	Significant
5 Sarclet	23.00	Medium	Medium	Significant
6 Hill O' Many Stanes	24.00	Medium-high	Medium	Significant
7 Lybster (end of Main Street)	27.00	Medium-high	Medium	Significant
8 Latheron (A9)	31.00	Medium-high	Medium	Significant
9 Dunbeath (nr Heritage Centre)	34.00	Medium-high	Medium	Significant
10 Berriedale (A9)	36.00	Medium-high	Medium-low	Not significant
11 Morven	49.00	Medium-high	Low	Not significant
12 Navidale	45.00	Medium-high	Medium-low	Not significant
13 Catchory	39.00	Medium	Low	Not significant
14 Minor Rd, S side Stemster Hill	34.00	Medium-low	Medium-low	Not significant
15 Whaligoe Steps	23.00	Medium-high	Medium	Significant
16 Lossiemouth Harbour	46.00	Medium	Low	Not significant
17 Buckie, Cliff Terrace	44.00	Medium-low	Low	Not significant
18 Portnockie - Bow Fiddle Rock	41.00	Medium-high	Low	Not significant
19 Cullen, Viaduct & cycle path	43.00	Medium-high	Low	Not significant
20 Bin Hill	46.00	Medium	Low	Not significant
21 Findlater Castle	43.00	Medium-high	Low	Not significant
22 Portsoy	45.00	Medium-high	Low	Not significant

Analysis	km
Max. distance where Low MoE occurred	49.00
Av. Distance where Low MoE occurred	43.00
Max. distance where Medium MoE occurred	34.00
Av. distance where Medium MoE occurred	27.00

Combined Cumulative Effect see Chapter 15.4

Combined cumulative effect with other windfarms, existing, consented or applied for - worst case

(terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect (Magnitude of change)	Significance of effect (Significance of impact)
1 Duncansby Head	42.00	Medium-high	Low	Not significant
2 Keiss Pier	35.00	Medium-high	Medium-low	Not significant
3 Sortat	40.00	Medium-low	Low	Not significant
4 Wick Bay	26.00	Medium-high	Medium-low	Not significant
5 Sarclet	23.00	Medium	Low	Not significant
6 Hill O' Many Stanes	24.00	Medium-high	Medium-low	Not significant
7 Lybster (end of Main Street)	27.00	Medium-high	Medium-low	Not significant
8 Latheron (A9)	31.00	Medium-high	Medium	Significant
9 Dunbeath (nr Heritage Centre)	34.00	Medium-high	Low	Not significant
10 Berriedale (A9)	36.00	Medium-high	Medium	Significant
11 Morven	49.00	Medium-high	Medium-low	Not significant
12 Navidale	45.00	Medium-high	Medium-low	Not significant
13 Catchory	39.00	Medium	Low	Not significant
14 Minor Rd, S side Stemster Hill	34.00	Medium-low	Medium	Not significant
15 Whaligoe Steps	23.00	Medium-high	Low	Not significant
16 Lossiemouth Harbour	46.00	Medium	Low	Not significant
17 Buckie, Cliff Terrace	44.00	Medium-low	Low	Not significant
18 Portnockie - Bow Fiddle Rock	41.00	Medium-high	Low	Not significant
19 Cullen, Viaduct & cycle path	43.00	Medium-high	Low	Not significant
20 Bin Hill	46.00	Medium	Low	Not significant
21 Findlater Castle	43.00	Medium-high	Low	Not significant
22 Portsoy	45.00	Medium-high	Low	Not significant

Analysis (cumulative)	km
Max. distance where Low MoE occurred	46.00
Av. Distance where Low MoE occurred	39.00
Max. distance where Medium MoE occurred	36.00
Av. distance where Medium MoE occurred	34.00

Scheme name	Moray West		
Document	Offshore EIA report see Chapter 14 summary p168/1025 & distances from p 17		
Data source	4COffshore, Morayofdhsore.com		
Status	Application submitted		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
749		751	
62-84		62-86	
Turbine blade tip height (m)		199-285	turbine type not decided
Distance from nearest coast km	22		

Effect

Additional effect to other existing windfarms as part of baseline (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect (Impact Magnitude)	Significance of effect (Effect Significance)
1: Duncansby Head	53	Medium-high	Low	Not-significant
2: Keiss	43	Medium-high	Negligible	Not-significant
3: Wick	32	Medium-high	Medium-low	Significant
4: Sarclet	26	Medium-high	Medium	Significant
5: Whaligoe Steps	26	Medium-high	Medium	Significant
6: Minor Road (SE of Osclay)	28	Medium	Medium	Significant
7: Lybster	25	Medium-high	Medium	Significant
8: Latheron	25	Medium-high	Medium	Significant
9a: Dunbeath	25	Medium-high	Medium	Significant
9b: Dunbeath	24	Medium-high	Medium-high	Significant
10: Morven	35	Medium-high	Medium-low	Not-significant
11: Berriedale (A9)	23	Medium-high	Medium	Significant
12: Navidale	28	Medium-high	Medium	Significant
13a: Brora	37	Medium-high	Medium-low	Not-significant
13b: Dornoch	49	Medium-high	Low	Not-significant
14: Tarbat Ness Lighthouse	37	Medium-high	Medium-low	Not-significant
15: Burghead Visitor Centre	38	Medium-high	Medium-low	Not-significant
16: Lossiemouth Harbour	32	Medium-high	Medium-low	Not-significant
17: Buckie	40	Medium-high	Medium-low	Not-significant
18: Bin Hill	43	Medium	Low	Not-significant
19 Portnockie	39	Medium-high	Medium-low	Not-significant
20: Cullen	41	Medium-high	Medium-low	Not-significant
21: Findlater Castle	42	Medium-high	Medium-low	Not-significant
22: Sandend	44	Medium-high	Low	Not-significant
23: Portsoy	50	Medium-high	Medium-low	Not-significant

Analysis	km
Max. distance where Low MoE occurred	53.00
Av. Distance where Low MoE occurred	47.00
Max. distance where Medium MoE occurred	28.00
Av. distance where Medium MoE occurred	26.00

Combined Cumulative Effect

Combined cumulative effect with other consented windfarms (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect (Cumulative Magnitude of change)	Significance of effect (Significance of Cumulative Effect)
4: Sarclet	26	Medium-high	Medium	Significant
5: Whaligoe Steps	26	Medium-high	Medium	Significant
6: Minor Road (SE of Osclay)	28	Medium	Medium	Significant
7: Lybster	25	Medium-high	Medium	Significant
8: Latheron	25	Medium-high	Medium	Significant
9a: Dunbeath	25	Medium-high	Medium	Significant
9b: Dunbeath	24	Medium-high	Medium	Significant
10: Morven	35	Medium-high	Medium-low	Significant
11: Berriedale (A9)	23	Medium-high	Medium	Significant
12: Navidale	28	Medium-high	Medium	Significant
13a: Brora	37	Medium-high	Low	Not significant
13b: Dornoch	49	Medium-high	Low	Not significant
14: Tarbat Ness Lighthouse	37	Medium-high	Low	Not significant
15: Burghead Visitor Centre	38	Medium-high	Low	Not significant
16: Lossiemouth Harbour	32	Medium-high	Low	Not significant
17: Buckie	40	Medium-high	Medium-low	Significant
18: Bin Hill	43	Medium	Medium-low	Not significant
19 Portnockie	39	Medium-high	Medium-low	Significant
20: Cullen	41	Medium-high	Medium-low	Significant
21: Findlater Castle	42	Medium-high	Medium-low	Significant
22: Sandend	44	Medium-high	Low	Not significant
23: Portsoy	50	Medium-high	Medium-low	Not significant

Analysis (cumulative)	km
Max. distance where Low MoE occurred	49.00
Av. Distance where Low MoE occurred	39.50
Max. distance where Medium MoE occurred	28.00
Av. distance where Medium MoE occurred	26.00

Scheme name	Navitus Bay Wind Park			
Document	Environmental Statement Volume C Chapter 13 Seascape Landscape and Visual p224+			
Data source	http://infrastructure.planningportal.gov.uk/projects/south-east/navitus-bay-wind-park			
Status	Withdrawn			

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW		970	
No. of turbines		121	
Turbine blade tip height (m)		200	
Distance from nearest coast km	10		

Effect

No other windfarms present or taken into consideration (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect (Magnitude)	Significance of effect (Significance of impact)
6 - Whiteways, Povington Hill	28.2	High	Low	Moderate
7 Swyre Head	23.1	High	Medium	Major-moderate
8 St Aldhelm's Head	19.0	High-medium	Medium	Major-moderate
9 Duriston Castle	14.4	High-medium	High-medium	Major-moderate
12 Old Harry Rocks	16.3	High	Medium	Major-moderate
16 Constitution Hill	25.6	High	Very low	Negligible
20 Hengisbury Head	20.4	High	Medium-low	Moderate
27 Hurst Castle	23.0	High-medium	High	Major
28 The Needles	17.7	High	High	Major
29 Tennyson's monument	19.5	High	Medium	Major-moderate
32 Limerstone Down	26.1	High	Medium-low	Moderate
33 Blackgang Car Park	27.8	High	Low-very low	Minor

Analysis	km
Max. distance where Low MoE occurred	28.2
Av. Distance where Low MoE occurred	28.2
Max. distance where Medium MoE occurred	23.1
Av. distance where Medium MoE occurred	19.5

Combined Cumulative Effect

Combined cumulative effect with other windfarms, either existing or proposed (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect	Significance of effect (Significance of impact)
6 - Whiteways, Povington Hill	28.2	High	Medium	Major-moderate
33 Blackgang Car PArk	27.8	High	Medium	Major-moderate

Analysis (cumulative)	km
Max. distance where Low MoE occurred	n/a
Av. Distance where Low MoE occurred	n/a
Max. distance where Medium MoE occurred	28.20
Av. distance where Medium MoE occurred	28.00

Scheme name	Neart na Gaoithe			
Document	ES - Chapter 21 Seascape, Landscape and Visual Impacts			
Data source	http://www.neartnagaoithe.com/environmental-statement1.asp			
Status	Consented			

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	448		
No. of turbines	45-54	128 to 64	
Turbine blade tip height (m)	208	175 to 197	
Distance from nearest coast km	15		

Effect

Additional effect to other existing windfarms as part of baseline (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect	Significance of effect (Significance of impact)
2 Beach Road, Kirkton, St Cyrus	49.00	High	Negligible	None
5 Dodd Hill	43.90	Medium	Negligible	None
6 Braehead of Lunan	39.00	High	Low	Moderate-minor
7 Arbroath	30.8	High	Medium-low	Moderate
8 Carnoustie	31.70	Medium	Medium-low	Moderate
9 Dunedee Law	44.90	Medium	Negligible	None
10 Tentsmuir	31.80	High	Medium-low	Moderate
11 Strathkinness	33.10	High	Low-negligible	Minor
12 St Andrews, East Scores	28.20	High	Low	Moderate
13 Fife Ness, Lochaber Rock	15.50	High	High	Major
14 Anstruther Easter	21.80	High	High	Major
15 Largo Law	36.80	Medium	Negligible	None
16 Isle of May	16.30	High	High	Major
17 North Berwick Law	33.00	High	Low	Moderate
18 Dunbar	28.00	High	Medium	Major-moderate
19 West Steel	34.90	Medium	Low	Minor
20 Coldingham Moor	32.80	Medium	Medium-low	Minor
21 St Abb's Head	33.00	High	Medium-low	Moderate

Analysis	km
Max. distance where Low MoE occurred	39.00
Av. Distance where Low MoE occurred	33.78
Max. distance where Medium MoE occurred	28.00
Av. distance where Medium MoE occurred	28.00

Combined Cumulative Effect

Combined cumulative effect with other windfarms, either existing or proposed (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect (Magnitude of impact)	Significance of effect (Cumulative impact significance - additional impact of Neart na Gaoithe in addition to all other cumulative wind farms)
2 Beach Road, Kirkton, St Cyrus	49.00	High	no info	Minor
5 Dodd Hill	43.90	Medium	no info	Minor
6 Braehead of Lunan	39.00	High	no info	Moderate-minor
7 Arbroath	30.8	High	no info	Moderate-minor
8 Carnoustie	31.70	Medium	no info	Moderate-minor
9 Dunedee Law	44.90	Medium	no info	Minor
10 Tentsmuir	31.80	High	no info	Major-moderate
11 Strathkinness	33.10	High	no info	Moderate-minor
12 St Andrews, East Scores	28.20	High	no info	Major-moderate
13 Fife Ness, Lochaber Rock	15.50	High	no info	Major
14 Anstruther Easter	21.80	High	no info	Major-moderate
15 Largo Law	36.80	Medium	no info	Minor
16 Isle of May	16.30	High	no info	Major
17 North Berwick Law	33.00	High	no info	Moderate-minor
18 Dunbar	28.00	High	no info	Moderate
19 West Steel	34.90	Medium	no info	Minor
20 Coldingham Moor	32.80	Medium	no info	Moderate-minor
21 St Abb's Head	33.00	High	no info	Moderate-minor

Analysis (cumulative)	km
Max. distance where Low MoE occurred	n/a
Av. Distance where Low MoE occurred	n/a
Max. distance where Medium MoE occurred	n/a
Av. distance where Medium MoE occurred	n/a

Scheme name	North Hoyle		
Document	North Hoyle Offshore Wind Farm Environmental Statement Chapter 5.3		
Data source	https://infrastructure.planninginspectorate.gov.uk		
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	60		
No. of turbines	30		
Turbine blade tip height (m)	107		
Distance from nearest coast km	7.5		

Effect

No other windfarms present appear to be taken into consideration (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity to change)	Magnitude of effect (Magnitude of change)	Significance of effect (Significance of effects)
1 Thos-on-Sea	20.4	Moderate	Low	Low to Moderate
2 Bryn Euryn	21.8	Moderate	Low	Low to Moderate
3 Mynydd Marian	18.7	Low to Moderate	Low	Low
4 Abergale / Pensam Station	14.2	Moderate	Low	Low to Moderate
5 Rhyl Aquarium	9.2	Low	Moderate	Low to Moderate
6 Graig Fawr	10.8	Moderate	Moderate	Moderate
7 Marian Ffrith	13.5	High	Moderate	Moderate to High
8 Prestatyn - Nova Centre	7.5	Low	High	Moderate
9 Point of Ayr	9.5	High	High	High
10 Bryn-llwyn - Viewpoint	9.6	Moderate	High	Moderate to High
11 Thurstaston Common	19.8	High	Low	Low to Moderate
12 Hilbre Point	14.8	Moderate to High	Low	Moderate

Analysis	km
Max. distance where Low MoE occurred	21.8
Av. Distance where Low MoE occurred	18.3
Max. distance where Medium MoE occurred	13.5
Av. distance where Medium MoE occurred	11.2

Combined Cumulative Effect see p52 (terminology in brackets if different in document)

Combined cumulative effect with other proposed windfarms, at Rhyl Flats and Burbo

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect	Significance of effect
1 Thos-on-Sea	20.4	Moderate	Low	
11 Thurstaston Common	19.8	High	Low	
3 Mynydd Marian	18.7	Low to Moderate	Low	
2 Bryn Euryn	21.8	Moderate	Low	
4 Abergale / Pensam Station	14.2	Moderate	Low	
12 Hilbre Point	14.8	Moderate to High	Low to moderate	
5 Rhyl Aquarium	9.2	Low	Moderate	
8 Prestatyn - Nova Centre	7.5	Low	Moderate	
6 Graig Fawr	10.8	Moderate	Moderate	
7 Marian Ffrith	13.5	High	Moderate to High	
10 Bryn-llwyn - Viewpoint	9.6	Moderate	Moderate to high	
9 Point of Ayr	9.5	High	High	

Analysis (cumulative)	km	
Max. distance where Low MoE occurred	20.4	
Av. Distance where Low MoE occurred	19.0	
Max. distance where Medium MoE occurred	14.2	Moderate assessed as Medium
Av. distance where Medium MoE occurred	9.2	

Scheme name	Rampion Offshore Wind Farm (Hastings Zone)		
Document	ES Section 12 - Seascape, Landscape & Visual Impact Assessment Dec 2012 p71+		
Data source	http://infrastructure.planninginspectorate.gov.uk		
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	400		note Option F modelled in ES
No. of turbines	116	100-175 (worst case)	
Turbine blade tip height (m)	140	165-210	
Distance from nearest coast km	13		

Effect

No other windfarms present (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect (magnitude of predicted visual change)	Significance of effect (level of predicted visual effect)
1 Beachy Head cliff top	22.50	Very high	Medium	Major
2 Birling Gap cliff top	19.60	Very high	Medium	Major
3 Birling Gap beach	19.60	Very high	Medium	Major
4 Seven Sisters C Park cliff top	17.80	Very high	Medium	Major
5 Seven Sisters Cuckmere Haven	18.70	Very high	Very small	Moderate
6 Seaford Head cliff top	15.70	Very high	Medium	Major
7 Seaford sea front promenade	15.50	High	Medium	Major-moderate
8 Newhaven Coastguard cliff top	14.60	Medium	Medium	Moderate
9 Peacehaven cliff top	13.90	High	Large	Major
10 Beacon Hill, Rottingdean	14.10	High	Large	Major
11 Brighton parade	14.20	High	Large	Major
12 Brighton sea front promenade	14.10	High	Large	Major
13 Shoreham/A259 coastal road	14.20	High	Medium	Major-moderate
14 Worthing sea front promenade	13.40	High	Large	Major
15 Littlehampton sea front	17.80	High	Medium	Major-moderate
16 Bognor Regis sea front	23.90	High	Small	Moderate
17 Pagham beach	28.20	High	Small	Moderate
18 Selsey sea front promenade	29.50	High	Small	Moderate
19 Willingdon Hill	24.00	High	Medium	Major-moderate
20 Firle Beacon	21.60	Very high	Medium	Major
21 Saxon Down	24.10	High	Small	Moderate
22 Hollingbury Golf Course	18.10	Very high	Medium	Major
23 Ditchling Beacon ridge	23.60	High	Medium	Major-moderate
24 Devil's Dyke	19.60	Very high	Large	Major
25 Upper Beeding	19.80	Medium	Very small	Minor-negligible
26 Cissbury Ring	18.90	Very high	Medium	Major
27 Highdown Hill	16.80	High	Large	Major
28 Springhead Hill	25.40	High	Medium	Major-moderate
29 Bignor Hill	30.00	Very high	Medium	Major-moderate

Analysis	km
Max. distance where Low MoE occurred	29.50
Av. Distance where Low MoE occurred	26.43
Max. distance where Medium MoE occurred	30.00
Av. distance where Medium MoE occurred	19.93

note: we assess 'Small' to be equivalent to 'Low'

Combined Cumulative Effect

Combined cumulative effect with other windfarms, either existing or proposed (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect (cumulative magnitude of visual change)	Significance of effect (level and significance of cumulative visual effect)
19 Willingdon Hill	24.00	High	Medium (no effect)	Major-moderate (no effect)
20 Firle Beacon	21.60	Very high	Medium (no effect)	Major (no effect)
21 Saxon Down	24.10	High	Small (no effect)	Moderate (no effect)

Analysis (cumulative)	km
Max. distance where Low MoE occurred	n/a or as above
Av. Distance where Low MoE occurred	n/a or as above
Max. distance where Medium MoE occurred	n/a or as above
Av. distance where Medium MoE occurred	n/a or as above

Scheme name	Sheringham shoal		
Document	ES May 2006		
Data source	http://sheringhamshoal.co.uk		
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	317		
No. of turbines	88		3.6 MW
Turbine blade tip height (m)	135	117, 142 and 172	note they consider visual effect similar
Distance from nearest coast km	17		

Effect

No other windfarms taken into consideration (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect (Magnitude of impact)	Significance of effect (Significance of impact)
1 Cromer Pier	19.00	High	Medium	Moderate
2 Wells-Next-The Sea	25.00	High	Low	Minor
3 Beeston Hill	17.00	High	High	Major
4 Viewpoint in Oak Wood	19.00	High	Medium	Moderate
5 Cley Marshes Nature Reserve	18.00	High	High	Major
6 Overstrand, car park	21.00	High	Medium	Moderate
7 Incleborough Hill	18.50	High	Medium	Moderate
8 Sheringham, Peddars Way	17.00	High	High	Major
9 Sheringham Coast Watch - hut	17.00	Medium	High	Moderate
10 Weybourne, Peddars Way	17.00	High	Medium	Moderate
11 Holgate Hill	19.00	Medium	Medium	Moderate
12 A148, crossroads near Bale	27.50	Medium	n/a	Negligible
13 Blakeney, car park	19.50	High	Medium	Moderate
14 Morston - car park	21.00	High	Medium	Moderate
15 Stiffkey Salt Marshes	22.00	High	Low	Minor
16 A149 St Withburga Church	27.50	Medium	n/a	Negligible
17 Beeston Regis Heath	19.00	Medium	Medium	Minor
18 Dead Man's Hill	17.00	Medium	High	Moderate
19 Muckleburgh Hill	18.00	Medium	High	Moderate
20 Holt, church	23.00	High	n/a	Negligible
21 West Beckham	21.50	Low	n/a	Negligible
22 A148	25.00	Medium	n/a	Negligible
23 Holkham Park	28.00	High	n/a	Negligible
24 Beacon Hill Road	32.00	High	n/a	Negligible
25 Gibraltar Point Viewpoint	35.00	High	n/a	Negligible
26 Passenger Ferry	5.00	m	High	Moderate

Analysis	km
Max. distance where Low MoE occurred	25.00
Av. Distance where Low MoE occurred	23.50
Max. distance where Medium MoE occurred	21.00
Av. distance where Medium MoE occurred	19.22

Combined Cumulative Effect

Incl proposed schemes at Cromer and Docking Shoal/Race Bank (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect (Magnitude of impact)	Significance of effect (Significance of impact)
1 Cromer Pier	19.00	High	not defined	Moderate
2 Wells-Next-The Sea	25.00	High	not defined	Minor
18 Dead Man's Hill	17.00	Medium	not defined	Moderate

Analysis (cumulative)	km
Max. distance where Low MoE occurred	not defined
Av. Distance where Low MoE occurred	not defined
Max. distance where Medium MoE occurred	not defined
Av. distance where Medium MoE occurred	not defined

Scheme name	Thanet		
Document	Thanet Offshore Wind Farm ES Chapter 13.6		
Data source			
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	300		
No. of turbines	100	60-100	
Turbine blade tip height (m)	115	150	
Distance from nearest coast km	11		

Effect

Other windfarms present or planned are not taken into consideration (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect (Magnitude of impact)	Significance of effect (Significance of impact)
Reculver Country Park	27.7	Low to Medium	Low	Minor
West Brook POS / Coastal Path	17.5	Medium	Medium	Moderate
Margate Harbour Wall	15.4	Medium	Low	Minor
Kingsgate / North Foreland	12.3	High	Medium to High	Moderate
Broadstairs Promenade	14.2	Medium to High	Medium to High	Moderate
Wellington Crescent, Ramsgate	16.6	Medium	Medium to Low	Minor to Moderate
Richborough Castle	24.5	Medium to Low	Negligible	Negligible
Kings Avenue / Princes Drive	23.5	Medium	Low to Medium	Minor to Moderate
Deal Pier / Promenade	25.6	Medium	Low to Medium	Minor to Moderate
St Margaret's at Cliffe	33	High	Low to Negligible	Minor

Analysis	km
Max. distance where Low MoE occurred	27.7
Av. Distance where Low MoE occurred	21.5
Max. distance where Medium MoE occurred	17.5
Av. distance where Medium MoE occurred	17.5

Combined Cumulative Effect

Combined cumulative effect with other windfarms (Kentish Flats) (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect (Magnitude of cumulaitve impact)	Significance of effect (Impact significance)
Reculver Country Park	27.7	Low to Medium	Medium	Minor to moderate
West Brook POS / Coastal Path	17.5	Medium	Medium	Moderate
Margate Harbour Wall	15.4	Medium	Minor	Minor to moderate
Kingsgate / North Foreland	12.3	High	Medium	Moderate

Analysis (cumulative)	km
Max. distance where Low MoE occurred	27.7
Av. Distance where Low MoE occurred	21.6
Max. distance where Medium MoE occurred	17.5
Av. distance where Medium MoE occurred	14.9

Scheme name	Walney Phase 1		
Document	Walney Offshore Windfarm ES Part 2		
Data source			
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	186		
No. of turbines	51	93	
Turbine blade tip height (m)	137	202	
Distance from nearest coast km	15		

Effect

Additional effect to other existing windfarms as part of baseline (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect (Magnitude of impact)	Significance of effect (Significance of impact)
St Bees Head	42.6	High	Negligible	Negligible/Nil
Seascale Beach	31.3	High (Residents)	Very Small	Minor
Bootle Fell	27.6	Medium	Very Small	Minor/Negligible
Black Combe	23.4	High	Small	Moderate/Minor
Coastal Path, Haverigg	18.8	High	Medium	Moderate/Minor
A593 Broughton in Furness	36.4	Medium	Negligible	Nil
A595 Kirkby in Furness	25.1	Medium	Very Small	Minor/Negligible
Hoad Monument, Ulverston	30.5	High	Negligible	Negligible/Nil
High Haume Farm	23	High	Small	Moderate/Minor
Biggar Bank, Walney	14.4	High (Residents)	Medium	Moderate
South WalneyNature Reserve	16.2	High	Medium	Moderate
Birkrigg Fell	26.8	High	Very Small	Minor
Humphrey Head	36.4	High	Negligible	Negligible/Nil
Morecambe Stone Pier	37.7	High	Negligible	Negligible/Nil
Heysham Head	35.6	High	Negligible	Negligible/Nil
Rossall Point, Fleetwood	28.9	High	Very Small	Minor
Blackpool Tower	35.2	High	Negligible	Negligible/Nil

Analysis	km
Max. distance where Low MoE occurred	23.4
Av. Distance where Low MoE occurred	23.2
Max. distance where Medium MoE occurred	18.8
Av. distance where Medium MoE occurred	16.5

Combined Cumulative Effect

In Walney ES 1.0 notes that:

Walney and West of Duddon Sands are assessed as a single entity,

and assessed in context of several other proposed windfarms on the Eastern Irish Sea.

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect (Magnitude of change)	Significance of effect (Significance of visual effect)
St Bees Head	42.6	High	Negligible	Negligible
Coastal Path, Haverigg	18.8	High	Large	Major
South WalneyNature Reserve	16.2	High	Large	Major
Biggar Bank, Walney	14.4	High (Residents)	Major	Major- moderate
Black Combe	23.4	High	Medium	Moderate
High Haume Farm	23	High	Medium	Moderate
Rossall Point, Fleetwood	28.9	High	Medium	Moderate
Blackpool Tower	35.2	High	Medium	Moderate
Bootle Fell	27.6	Medium	Small	Minor
A595 Kirkby in Furness	25.1	Medium	Small	Minor
Birkrigg Fell	26.8	High	Small	Moderate -minor
Seascale Beach	31.3	High (Residents)	Very small	Minor
A593 Broughton in Furness	36.4	Medium	Very small	Minor
Hoad Monument, Ulverston	30.5	High	Very small	Minor
Humphrey Head	36.4	High	Very small	Minor - negligible
Morecambe Stone Pier	37.7	High	Very small	Minor - negligible
Heysham Head	35.6	High	Very small	Minor - negligible

Analysis (cumulative)	km
Max. distance where Low MoE occurred	27.6
Av. Distance where Low MoE occurred	26.5
Max. distance where Medium MoE occurred	35.2
Av. distance where Medium MoE occurred	27.6

Small' assessed as Low

Scheme name	Walney Extension Offshore Windfarm		
Document	Environmental Statement Volume 1 Chapter 19 Seascape, landscape and visual impact assessment June 2013 p.69+		
Data source	http://infrastructure.planninginspectorate.gov.uk/projects/north-west/walney-extension-offshore-wind-farm		
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	750		
No. of turbines	110	93-207	
Turbine blade tip height (m)	222	142-222	
Distance from nearest coast km	19		

Effect

Additional effect to other existing windfarms as part of baseline (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect (Magnitude of impact)	Significance of effect
1 St Bees head	39.56	High	Low-negligible	Minor
2 Thornhill	39.15	Low	Low-negligible	Negligible
3 Seascale beachfront	33.78	High-medium	Low-negligible	Minor
4 Seafront at Ravenglass	32.33	High	Low	Moderate
5 Black Combe, Bootle fell	27.79	High	Medium-low	Major-moderate to moderate
6 Coastal path Silecroft	24.29	High	Low	Moderate
7 Public footpath NW Milcom	28.18	High	Low-negligible	Minor
8 Askam in Furness	29.06	High	Negligible	Negligible
9 Biggar Bank Rd Walney Island	20.75	High	Low	Moderate
10 South End Haws Walney Island	22.69	High	Low	Moderate
11 Morecambe Stone Pier	44.06	High	None	None
12 Rossal Point Fleetwood	34.46	Medium	Negligible	Negligible
13 Blackpool promenade	38.98	High	Negligible-none	Negligible-none
14 Douglas Head Isle of Man	35.94	High	Negligible	Negligible
15 Loch promenade Douglas	36.66	High-medium	Negligible	Negligible
16 Snaefell Isel of Man	38.28	High	Negligible	Negligible
17 Maughold, Isle of Man	31.29	High	Low-negligible	Negligible

Analysis	km
Max. distance where Low MoE occurred	32.33
Av. Distance where Low MoE occurred	25.02
Max. distance where Medium MoE occurred	n/a
Av. distance where Medium MoE occurred	n/a

Combined Cumulative Effect

Combined cumulative effect with other windfarms, either existing or proposed (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor	Magnitude of effect (combined effect offshore)	Significance of effect
3 Seascale beachfront	33.78	High-medium	Low-negligible	Minor
5 Black Combe, Bootle fell	27.79	High	Medium	Major-moderate
9 Biggar Bank Rd Walney Island	20.75	High	Low	Moderate
12 Rossal Point Fleetwood	34.46	Medium	Negligible	Negligible
17 Maughold, Isle of Man	31.29	High	Medium	Major-moderate

Analysis (cumulative)	km
Max. distance where Low MoE occurred	21.00
Av. Distance where Low MoE occurred	21.00
Max. distance where Medium MoE occurred	31.29
Av. distance where Medium MoE occurred	29.54

Scheme name	West of Duddon Sands		
Document			
Data source			
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	389		
No. of turbines	108	139	
Turbine blade tip height (m)	150	150	
Distance from nearest coast km	14		

Effect

Additional effect to other existing windfarms as part of baseline (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect (Magnitude of impact)	Significance of effect (Significance of impact)
Seascale Beach	41.1	High (Residents)	Negligible	Negligible / Nil
Bootle Fell	32.5	Medium	Very Small	Minor / Negligible
Black Combe	26.3	High	Small	Moderate / Minor
Coastal Path Haverigg	20.2	High	Small	Moderate / Minor
A593 Broughton in Furness	35.9	Medium	Negligible	Nil
A595 Kirkby in Furness	25.4	Moderate	Very Small	Minor / Negligible
Hoad Monument Ulverston	30.8	High	Very Small	Minor
High Haume Farm	23.5	High	Small	Moderate / Minor
BiggarBank, Walney	14.6	High (residents)	Medium	Moderate
South Walney Nature Reserve	7.5	High	Medium	Moderate
Birkrigg Fell	27.1	High	Very Small	Minor
Humphrey Head	35.7	High	Very Small / Negligible	Minor / Negligible
Morecombe Stone Pier	35.1	High	Negligible	Negligible / Nil
St Patrick's Chapel	32.6	High	Very Small	Minor
Rossall Point, Fleetwood	23	High	Small	Moderate / Minor
Blackpool Tower	27.9	High	Very Small	Minor
St Annes Pier	33.8	High	Negligible	Negligible / Nil

Analysis	km
Max. distance where Low MoE occurred	26.3
Av. Distance where Low MoE occurred	23.2
Max. distance where Medium MoE occurred	14.6
Av. distance where Medium MoE occurred	11.0

Combined Cumulative Effect

see Walney 1

Scheme name	Westermost Rough A		
Document	Seascape and Visual Assessment February 2009 p38		
Data source	http://www.marinedataexchange.co.uk		
Status	Implemented		

Windfarm details	as built or consented	as assessed in ES/SLVIA	Notes eg turbine types
Total turbine capacity MW	210		
No. of turbines	35	35 to 110	
Turbine blade tip height (m)	177	112 to 172	
Distance from nearest coast km	8		

Effect

No other windfarms present or taken into consideration (terminology in brackets if different in document)

Viewpoint	Distance (km) from turbine	Sensitivity of receptor (Sensitivity)	Magnitude of effect (Magnitude of impact)	Significance of effect (Significance of impact)
1 Spurn Head Bird Obervatory	17.50	Medium-high	Medium	Moderate
2 Seaside Road / Central Promenade, Withernsea	8.10	Medium	Medium-high	Moderate
3 Layby on Pilmar Lane, Roos	10.60	Medium-low	Medium-low	Moderate-minor
4 East Newton Road, Aldbrough	13.00	High	Medium	Moderate-major
5 North End Marine Drive / Eastgate, Hornsea	20.00	Medium-low	Low-medium	Minor-moderate
6 Viewing Point, North Harbour, Bridlington	35.00	Low-medium	Low-negligible	Minor-negligible
7 PROW, South Landing, Flamborough Head	34.50	Medium-high	Low-negligible	Minor
8 North Road, Halsham	12.50	Low	Low-medium	Minor-moderate
9 Stonebridge Car Park, Donna Nook	32.60	Low-medium	Low	Minor

Analysis	km
Max. distance where Low MoE occurred	32.60
Av. Distance where Low MoE occurred	32.60
Max. distance where Medium MoE occurred	17.50
Av. distance where Medium MoE occurred	15.25

Combined Cumulative Effect no data found

From ES: "Three potential sources for cumulative effect have been identified. These include the operational wind farms at Out Newton and Hull Waste Water Treatment Works, the consented wind farm at Lisset Airfield (onshore) and those registered 'in planning' which includes the Humber Gateway (Round 2 offshore) and the onshore wind farm at Burton Pidsea."

Appendix B: Glossary

Term	*Definition*
Apparent	object visible in the seascape/landscape.
Aspect	in Wales, an aspect is a component of the LANDMAP information recorded, organised and evaluated into a nationally consistent spatial data set. The landscape information is divided into five aspects- geological landscape, landscape habitats, visual and sensory, historic landscape and cultural landscape.
Aspect area	areas defined in each of the LANDMAP aspect assessments which are mutually exclusive
Assessment	term to describe all the various ways of looking at, analysing, evaluating and describing the seascape/landscape or assessing impacts on seascape/landscape and visual receptors.
Biodiversity	the variety of life including all the different habitats and species in the world.
Character	see seascape character or landscape character.
Characteristics	Elements, features and qualities which make a particular contribution to distinctive character.
Characterisation	the process of identifying areas of similar character, classifying and mapping them and describing their character. *
Classification	concerned with dividing the seascape into areas of distinct, recognisable and consistent common character and grouping areas of similar character together. It requires the identification of patterns in the seascape, created by the way the natural and human influences interact and are perceived and experienced to create character in the seascape.
Conservation	the protection and careful management of natural and built resources and the environment.
Consistent	relatively unchanging element or pattern across a given area of seascape/landscape.
Cultural heritage asset	see heritage asset
Cumulative impacts/effects	either additional changes caused by a proposed development in conjunction with similar developments or the combined effect of a set of developments, taken together
Description	capturing the overall essence of the character of the seascape, with reference to geology, landform, bathymetry, habitats, use of the coast and sea, cultural associations etc, drawing out the ways in which these factors interact together and are perceived and experienced and are associated with events and people. *
Elements	individual component parts of the seascape such as beaches, cliffs, submerged reefs, sea walls, groynes and rocky outcrops.
Features	particularly prominent or eye-catching elements such as lighthouses, rock stacks and coastal cliffs.

Term	*Definition*
Key characteristics	those combination of elements, features and qualities which optically important to the current character of the seascape and help give an area its distinct sense of place.
Distinctiveness	see sense of place
Diversity	(in terms of the function of an area) the variety of different functions of an area.
Dominant	main defining feature or pattern.
Effects	term used in environmental impact assessment (EIA) where effects are changes arising from the action, operation or implementation of a proposed development.
Heritage asset	a designated or non-designated building, monument, site, place, area or landscape positively identified as having a degree of historical significance meriting consideration in planning decisions. Designated heritage assets include world heritage sites, scheduled ancient monuments, protected wreck sites, battlefields, listed buildings and registered parks and gardens.
Impact	used as part of overall term, as in EIA or SVIA, to help describe the process of assessing potentially significant effects- see effects.
Inherent	dictionary definition- 'existing as an inseparable part'. In the context of sensitivity means the sensitivity of the seascape/landscape zone itself with all its component elements and features rather than its relationship with adjacent zones.
Integrity	unspoilt by large-scale, visually intrusive or other inharmonious development
Landcover	combinations of natural and man-made elements including vegetation that cover the land surface.
Landform	combinations of slope and elevation which combine to give shape and form to the land.
LANDMAP	*LANDMAP* is the national Geographical Information System (GIS) based information system for Wales, devised by the Countryside Council for Wales, for taking landscape into account in decision-making. It is a nationally consistent dataset divided into 5 aspects- geological landscapes, landscape habitats, visual and sensory, historical landscapes and cultural landscapes.
Landscape	an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors
Landscape and Visual Impact Assessment (LVIA)	Landscape and Visual Impact Assessment is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and on people's views and visual amenity. (GLVIA 2013)
Landscape Character	a distinct, recognisable and consistent pattern of elements, features and qualities in the landscape that makes one landscape different from another, rather than better or worse.

Term	*Definition*
Landscape Character Area (LCA)	these are single unique areas which are discrete geographical areas of a particular landscape type. Each has its own individual character and identity, even though it shares the same generic characteristics with other areas of the same type. These areas in Wales are primarily derived from LANDMAP aspects.
Landscape resource	The overall stock of the landscape and its component parts. (The landscape considered as a measurable finite resource like any other eg minerals, land, water).
Landscape value	the relative value or importance attached to landscapes and LANDMAP aspects. These express national or local consensus e.g. designations or recognition, quality, special qualities including perceptual aspects such as scenic beauty, tranquillity or wildness, cultural associations or conservation issues. Value is also attributed to each LANDMAP aspect using a variety of criteria. An indication of how an area is valued may also be gained from observation of how it is used- eg a popular path to a hilltop viewpoint.
Magnitude of effect	degree of change
Objective	method of assessment in which personal feelings and opinions do not influence characterisation or judgements.
Perception	perception combines the sensory (that which we receive through our senses) with the cognitive (knowledge and understanding gained from many sources and experiences).**
Prominent	Standing out, striking, sharp, unmistakeable, easily seen feature or pattern in the landscape.
Protect	to keep from harm.
Qualities	aesthetic (objective visible patterns)or perceptual (subjective responses by the seascape/landscape assessor) attributes of the seascape/landscape such as those relating to scale or tranquillity respectively.
Quality	Based on judgements about the physical state of the seascape/landscape, and about its intactness, from visual, functional and ecological perspectives. It also reflects the state of repair of individual features and elements which make up the character in any one place.
Receptor, visual	people in a variety of different situations who can experience views within an area and who may be affected by change or development. Receptors can include users of public footpaths, open access land, roads, rail or cycleways or urban or rural residents.
Receptor, seascape/landscape	seascape/landscape character areas, designations, elements or features which may be affected by development
Remoteness	physical isolation, removal from the presence of people, infrastructure (roads and railways, ferry and shipping routes) and settlement
Resource	see seascape/landscape resource.

Term	*Definition*
Seascape	The definition of seascape has two definitions which are both relevant: An area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land with sea, by natural and/or human factors. (Derived from European Landscape Convention, 2000). Landscapes with views of the coast or seas, and coasts and the adjacent marine environment with cultural, historical and archaeological links with each other. (UK Marine Policy Statement, 2011, 2.6.5.1)
Seascape character	Seascape character is a distinct and recognizable pattern of elements and features in the seascape that makes one seascape different from another, rather than better or worse.
Seascape character assessment (SCA)	SCA is the process of identifying and describing variation in the character of the seascape, and using this information to assist in managing change in the seascape. It seeks to identify and explain the unique combination of elements and features that make seascape distinctive. *
Seascape character areas	these are single unique areas which are discrete geographical areas of a particular seascape character. Each has its own individual character and identity. These areas may be made up of a number of seascape types.
Seascape character types (marine)	these are distinct types of seascape that are relatively homogenous in character. They are generic in nature in that they may occur in different locations but wherever they occur they share broadly similar combinations of bathymetry, seabed geology and wave climate characteristics.
Seascape quality	the physical state of the seascape. It includes the extent to which typical character is represented in individual areas, sometimes referred to as strength of character, the intactness of the seascape from visual, functional and ecological perspectives and the condition or state of repair of individual elements of the seascape.*
Seascape sensitivity	The extent to which a seascape can accept change of a particular type and scale without unacceptable adverse effects on its character.
Seascape and Visual Impact Assessment (SVIA)	is an established methodology which is used to assess the impact of the development or other use change on seascape, related landscape and visual amenity. It includes analysis of the effects during the construction, operation and decommissioning phases of the development, including any restoration or after uses.
Scenic quality	seascape/landscape with scenes of a picturesque quality with aesthetically pleasing elements in composition
Scheduled monument	monument/feature of historic interest and national importance with statutory protection, most with little prospect of economic use. Governed by the Ancient Monuments and Archaeological Areas Act 1979 as amended and updated by the Historic Environment (Wales) Act 2016.

Term	*Definition*
Sense Of Place	the character of a place that makes it locally identifiable or distinctive ie different from other places. Some features or elements can evoke a strong sense of place eg islands, forts, vernacular architecture
Sensory	that which is received through the senses ie sight, hearing, smell, touch.
Setting, of a landscape or heritage asset	The surroundings in which the asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or a negative contribution to an asset, may affect the ability to appreciate that significance or may be neutral.
Settlement	all dwellings/habitations, whether single or clustered in cities, towns and villages.
Significance	in environmental impact assessment- the importance of an effect. A significant effect needs to be taken into account in decision-making.
Subjective	method of assessment in which personal views and reaction are used in the characterisation process.
Topography	term used to describe the geological features of the Earth's surface eg mountains, hills, valleys, plains.
Unity	consistency of pattern over a wide area ie the repetition of similar elements, balance and proportion, scale and enclosure.
Value	see landscape value
Viewing distance	The distance between the eye and an image/visualisation of a development.
Visual Effects	the likely visual effects undergone by people that would result from a development proposal or change in land management.
Visual sensitivity	visual sensitivity is a measure of the degree to which change is likely to cause a visual impact within a particular seascape/landscape.
Wind energy development/ Wind farm	development consisting of one or more wind turbines and supporting infrastructure.
Wireline/wireframe	Digital virtual model of a development showing only the outline shape set on a virtual landscape/seascape surface, usually shown as a grid.
ZTV	ZTV or ZVI (Zone of Visual Influence) analysis is the process of determining the visibility of an object in the surrounding landscape. The process is objective in which areas of visibility or non-visibility are determined by computer software using a digital elevation dataset. The output from the analysis is used to create a map of visibility.

Abbreviations

AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
BAP	Biodiversity Action Plan
CLVIA	Cumulative Landscape and Visual Impact Assessment
CCW	Countryside Council for Wales
EIA	Environmental impact assessment
GLVIA	Guidelines for landscape and visual impact assessment
GIS	Geographic information system
HPMCZ	Highly protected marine conservation zone
HSC	Historic Seascape Characterisation
HW	High water
HWM	High water mark
ICZM	Integrated Coastal Zone Management
Km	Kilometres
LCA	Landscape character assessment *or* landscape character area
LDP	Local Development Plan
LVIA	Landscape and visual impact assessment
LW	Low water
LWM	Low water mark
m	Metres
MPA	Marine Planning Area
MPS	Marine Policy Statement
nm	Nautical miles
NSIP	Nationally significant infrastructure project
NRW	Natural Resources Wales
0ESEA	Offshore Energy Strategic Environmental Assessment
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SM	Scheduled Monument
SCA	Seascape character assessment /seascape character area
SCT	Seascape character type
SLA	Special Landscape Area
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SLVIA	Seascape, landscape and visual impact assessment
SVIA	Seascape and visual impact assessment

Data Archive Appendix

Data outputs associated with this project are archived in [NRW to enter relevant corporate store and / or reference numbers] on server–based storage at Natural Resources Wales.

The data archive contains:

[A] The final report in Microsoft Word and Adobe PDF formats.

[B] A full set of maps produced in JPEG format.

[C] A series of GIS layers on which the maps in the report are based with a series of word documents detailing the data processing and structure of the GIS layers

[F] A full set of images produced in [jpg/tiff] format.

Metadata for this project is publicly accessible through Natural Resources Wales' Library Catalogue https://libcat.naturalresources.wales (English Version) and https://catllyfr.cyfoethnaturiol.cymru (Welsh Version) by searching 'Dataset Titles'. The metadata is held as record no [NRW to insert this number]

DO NOT DELETE THE SECTION BREAK BELOW

Published by:
Natural Resources Wales
Address line one
Address line two
Address line three
Post Code

0000 000 000

Further copies of this report are available from:

Email: library@cyfoethnaturiolcymru.gov.uk

Cyfoeth Naturiol Cymru
Natural Resources Wales

Seascape and visual sensitivity to offshore wind farms in Wales:

Strategic assessment and guidance

Stage 2- Guidance on siting offshore windfarms

Simon White, Simon Michaels and Helen King, White Consultants

Report No 330

www.naturalresourceswales.gov.uk

About Natural Resources Wales

Natural Resources Wales' purpose is to pursue sustainable management of natural resources. This means looking after air, land, water, wildlife, plants and soil to improve Wales' well-being, and provide a better future for everyone.

Evidence at Natural Resources Wales

Natural Resources Wales is an evidence based organisation. We seek to ensure that our strategy, decisions, operations and advice to Welsh Government and others are underpinned by sound and quality-assured evidence. We recognise that it is critically important to have a good understanding of our changing environment.

We will realise this vision by:

- Maintaining and developing the technical specialist skills of our staff;
- Securing our data and information;
- Having a well resourced proactive programme of evidence work;
- Continuing to review and add to our evidence to ensure it is fit for the challenges facing us; and
- Communicating our evidence in an open and transparent way.

This Evidence Report series serves as a record of work carried out or commissioned by Natural Resources Wales. It also helps us to share and promote use of our evidence by others and develop future collaborations. However, the views and recommendations presented in this report are not necessarily those of NRW and should, therefore, not be attributed to NRW.

Report series:	NRW Evidence Series
Report number:	330
Publication date:	May 2019
Contract number:	N/A
Contractor:	White Consultants: Environment Ltd in association with Northumbria University
Contract Manager:	L. Skates
Title:	**Seascape and visual sensitivity to offshore wind farms in Wales: Strategic assessment and guidance. Stage 2-Guidance on siting offshore windfarms**
Author(s):	**White, S. Michaels, S. King, H**.
Restrictions:	None

Distribution List (core)

NRW Library, Bangor	2
National Library of Wales	1
British Library	1
Welsh Government Library	1
Scottish Natural Heritage Library	1
Natural England Library (Electronic Only)	1

Distribution List (others)

Will be circulated to relevant parties electronically

Recommended citation for this volume:

White, S. Michaels, S. King, H. 2019. Seascape and visual sensitivity to offshore wind farms in Wales: Strategic assessment and guidance. Stage 2- Guidance on siting offshore windfarms. NRW Evidence Series. Report No: 330, 29pp, NRW, Bangor.

Contents

List of Tables

1. Introduction

1.1. The brief

Natural Resources Wales (NRW) appointed White Consultants in November 2018 to undertake a strategic assessment and prepare guidance for seascape and visual sensitivity to offshore wind farms in Wales' marine plan areas.

The brief states that the project aims are:

- To undertake strategic assessment and mapping of areas of visual sensitivity to offshore windfarm development around the coast of Wales, which NRW can use to inform ongoing discussions with the Crown Estate and others, including Welsh Government and developers, about the leasing and consenting of any new areas for offshore wind.
- To prepare a short siting guidance paper in relation to seascape and visual effects of offshore wind farms aimed at an audience of developers, marine planners and NRW staff.

The project is in three parts, of which this report is the second. The parts are:

- A visual effects ready reckoner showing the recommended distances from National Parks and Areas of Outstanding Natural Beauty (AONBs) in relation to different turbine heights.
- A guidance note setting out what offshore windfarm developers need to know in relation to seascape and visual effects at their site search stage.
- A seascape sensitivity assessment for offshore windfarms in Wales' marine plan area.

These parts are complementary to each other and should be considered together in order to inform the best location for future offshore wind farm locations, in terms of seascape and visual matters.

The brief sets out the following requirement for the guidance note:

- Overview of the UK and Welsh policy context
- Overview of the seascape context
- Preparation of a short siting guidance paper aimed at an audience of developers and their planners, and regulators, including NRW staff.
- Consideration of seascape and visual factors that should influence site choice.
- Note key technical references and guidance.
- Overall, set out what a developer needs to consider and do to minimise seascape and visual impact.

The document is concise and seeks to build on, rather than duplicate or replace, existing guidance. It should be read in conjunction with national and local planning policies, National Park and AONB management plans, national and local guidance, seascape and landscape character assessments and other baseline information.

1.2. Background and policy context

Three rounds of offshore wind development with extensions have been implemented around English and Welsh coasts. These have been subject to UK Offshore Energy Strategic Environmental Assessments. The UK Government has now announced an intention to deploy further offshore wind developments up to a maximum additional capacity of up to 7GW. In addition to running a programme to facilitate extensions of existing windfarms in England and Wales, the Crown Estate have announced leasing Round 4 to determine further areas of sea bed that might be leased for new offshore wind. These include the North Wales Region 16 but also include Anglesey Region 15 as an area for further consideration. Within the leased areas individual developers will carry out site searches to locate wind farms and put forward proposals.

An overview of the policy context is set out in **Appendix A**. The key legislation and documents are listed below:

- The Well-being of Future Generations (Wales) Act 2015
- Planning Policy Wales (PPW10)
- Marine and Coastal Access Act (2009)
- Welsh National Marine Plan (draft)
- UK National Policy Statements (NPS)- EN-1 and EN-3- considering nationally significant energy infrastructure projects
- Environment Act 1995 with particular reference to National Parks and AONBs.

This guidance sets out good practice guidance in Chapter 2, a description of the Welsh seascape in Chapter 3, a series of objectives and principles on how to minimise seascape and visual effects in Chapter 4, and checklist of tests and relevant documentation in Chapter 5. The policy context is set out in **Appendix A,** seascape sensitivity factors in **Appendix B**, and a bibliography in **Appendix C.**

2. Seascape and landscape planning guidance

2.1. Definition of seascape

There is no legal definition of seascape. The draft Welsh National Marine Plan, drawing on the European Landscape Convention (ELC) and the UK Marine Policy Statement (MPS) states that seascape should be taken as meaning:
'…landscapes with views of the coast or seas, and coasts and the adjacent marine environment with cultural, historical and archaeological links with each other.'

NECR105 (see below) also uses the following:
'An area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land with sea, by natural and/or human factors' (page 8)

Together, these update and incorporate the definition quoted in EN-3 and DTI (2005) which state that seascape is a discrete area within which there is shared intervisibility between land and sea (EN-3- 2.6.199).

2.2. Definition of natural beauty

The National Parks and Access to the Countryside Act 1949 (as amended) does not contain a legal definition of 'natural beauty'. However, references to conservation of natural beauty include conservation of flora, fauna and geological and physiographical features. In Wales, the range of landscape attributes which contribute to an understanding of natural beauty are substantially similar to the factors that influence value in GLVIA 3 (see below and Box 5.1). These include scenic quality, sense of place, landscape quality, integrity, perceptual qualities (including wildness and tranquillity), cultural associations, rarity or representativeness, historic and nature conservation interest. The defined special qualities of designated areas set out in their management plans can also assist in an understanding of the natural beauty of a given area.

2.3. An Approach to Seascape Character Assessment, (NECR105), 2012

This document sets out the principles of seascape character assessment (SCA), an overview of the process, terms and definitions and relevant data. It is focused on baseline seascape studies and does not cover sensitivity or visibility issues.

2.4. Guidelines for Landscape and Visual Impact Assessment, Edition 3, (GLVIA 3) LI and IEMA, 2013.

This guidance is the most up-to-date guidance on carrying out Landscape and Visual Impact Assessment (LVIAs). It defines landscape as including seascapes and marine areas in line with the European Landscape Convention. It states that any assessment of landscape and visual effects should carefully consider the relationship between land and sea in coastal areas and also take account of possible requirements to consider the open sea (2.9).

2.5. Guidance on the Assessment of the Impact of Offshore Windfarms: seascape and visual impact report, DTI, 2005.

This is the most comprehensive guidance focused on the seascape and visual impact of offshore windfarms. As such, it should be taken into consideration in scoping and preparing SVIAs to inform the location of offshore wind farms. The most relevant section to this guidance is Section 6 which considers siting, layout and design. It should be noted that the guidance was completed prior to the two documents above and the baseline information has changed so it is dated to an extent. Where there is a conflict between this and GLVIA 3, the latter should be used as the more up-to-date guidance.

The main differences are that the methods for defining the extent of a seascape area are significantly different and the means for assessing sensitivity (value and susceptibility) and magnitude of effect have been refined. In addition, the height of wind turbines have significantly increased with associated implications for various factors such as seaward limits of visual significance. The Stage 1 ready reckoner report addresses the magnitude of effect of various turbine heights.

A key principle which is reflected in this guidance is that the single most important consideration when seeking to avoid adverse seascape and visual effects is the siting or choice of location of an offshore windfarm (DTI, 2005, page 48, 6.2). It discusses a series of principles which are refined and updated in the light of more recent experience in local seascape character assessments and Wales in Chapter 4.

3. The seascape of Wales

3.1. Overview

Wales lies on the exposed western seaboard of the UK with a long coastline of 2,120km[1]. The coast is varied, ranging from coastal cities and settlements on flat coastal plains, such as Cardiff and Rhyl, through to remote rocky peninsulas and islands such as off Pembrokeshire and Llŷn. Between the headlands are wide sweeping bays and intimate coves. Many coasts are rocky with cliffs which give elevated views out to sea, extending the distance to the horizon. Some stretches of coast are overlooked by mountains such as Snowdonia. A significant proportion of landscapes on or near the coast are designated as National Park or Area of Outstanding National Beauty (AONB). Offshore to the south west, lie the exposed Celtic Sea and North Atlantic Ocean. To the north, the Irish Sea runs from west of Cardigan Bay and Anglesey to the English coast. Existing offshore windfarm developments in Welsh waters are concentrated off the north coast and include Gwynt y Mor, Rhyl Flats and North Hoyle, with Burbo Bank and its extension visible to the east. There are ferry and/or commercial shipping routes across the Irish Sea and the Bristol Channel and there are other users of the sea include the Ministry of Defence (MOD), such as off south Pembrokeshire.

3.2. Seascape Character Assessments

There are two levels of seascape character assessment in Wales. National Marine Character Areas (NMCAs)[2] cover the draft Welsh National Marine Plan inshore area. 29 NMCAs are spatially defined, each with a useful broad brush profile setting out the key characteristics, natural influences, cultural influences, aesthetic and perceptual qualities and a visibility analysis. The assessment does not address their sensitivity to change.

There are three local seascape character assessments so far completed. These are for Snowdonia National Park and Anglesey, Pembrokeshire Coast, and Carmarthen Bay, Gower and Swansea Bay. These are carried out at a greater level of detail, defining key characteristics, natural influences, cultural influences, aesthetic and perceptual qualities and forces for change. They also list factors that contribute to, or detract from, an area's sensitivity. This information may be helpful to inform what attributes may be sensitive to offshore wind farms if these are intervisible.

[1] Draft Welsh National Marine Plan, Welsh Government, December 2017, para 5,
[2] National Seascape Assessment for Wales, NRW Evidence Report No: 80, LUC, November 2015

3.3. National Parks and AONBs

Many of these designations in Wales are located on the coast and some of their most important special qualities relate to the setting provided by the sea. For instance, Anglesey AONB's special qualities include expansive views/seascapes, islands, peace and tranquillity. Pembrokeshire Coast's qualities include its coastal splendour, islands, remoteness, tranquillity and wildness. In the Llŷn AONB qualities include the connection between land, coast and sea. Visual receptors within these areas, such as users of the Coast Path, are likely to be particularly sensitive to views out to sea. The waters of the Bristol Channel form part of the setting for designated landscapes in England- including Exmoor National Park and the North Devon Coast AONB.

3.4. Heritage Coasts

Heritage coasts are stretches of outstanding undeveloped coast in England and Wales that were substantially defined through agreement between the Countryside Commission and local authorities. Most of them fall within National Parks or AONBs, at Anglesey, Llŷn, Pembrokeshire Coast and Gower, while three lie outside- the Great Orme, Ceredigion and Glamorgan. The protection and management of the Gower Heritage Coast, for example, is considered as integral to the AONB and the management plan. Visual receptors within these areas, such as users of the Coast Path, are likely to be particularly sensitive to views out to sea.

3.5. World Heritage Sites

World heritage sites are international designations. There are four coastal examples in Wales – the castles at Caernarfon, Conwy, Beaumaris and Harlech. These have relatively small defined areas of essential setting but still benefit from their much wider landscape and seascape settings. They also act as historic landmarks contributing to seascape character and sensitivity. Views to and from these castles need to be carefully considered.

3.6. Other designations

Other designated areas of historic or nature conservation value can contribute to landscape and seascape sensitivity, and their characteristics can add to sense of place. Scheduled monuments such as coastal forts are often located on remote promontories with wide sea views whilst others, like St Govan's Chapel, have views sharply defined by headlands. Conservation Areas and listed buildings may be located in more developed coasts but have historic character and may have important sea views.

3.7. LANDMAP

LANDMAP is an all-Wales GIS resource which describes and evaluates the landscape in terms of different aspects or layers, including- geological landscapes, landscape habitats, visual and sensory, historical landscape and cultural landscape. The visual and sensory is the most useful aspect for considering the potential effect of offshore windfarms as it is concerned with intervisibility, views and scenic quality. The overall evaluation is particularly useful to identify areas of outstanding value

(equivalent to international/national level) which are intervisible with the sea. The historic landscapes layer is also a useful indicator of potential sensitivity, describing key features and, where relevant, the relationship between the coast and the sea.

3.8. Landscape Character Assessments

At a broad scale, equivalent to England's National Character Areas, Wales has 48 National Landscape Character Areas (NLCAs). Their descriptive profiles highlight what distinguishes one landscape from another, with reference to their regionally distinct natural, cultural and perceptual characteristics.

Local landscape character assessments describe the landscape on a local authority basis but there is not full coverage of Wales. These assessments are usually derived from LANDMAP, with added information. They are useful to understand the perceptual qualities of coastal related areas and some may include landscape sensitivity assessments to particular types and scales of development. Many of these assessments have been adopted as local Supplementary Planning Guidance.

3.9. Special Landscape Areas

Outside nationally designated areas local authorities may have commissioned studies to identify Special Landscape Areas (SLAs). These are based primarily on LANDMAP evaluations and information, and are verified on site. Some go further with additional information which may pick up relevant perceptual qualities which may be relevant for coastal SLAs. Sometimes these areas lie on the edges of national designations and complement their qualities and help protect their settings. These are at a county level of importance, and policies relate usually only to development within an SLA. However, they are a further indicator of landscape value. Relevant SLAs include those around the Great Orme, Gwynedd e.g. Llŷn, on the Ceredigion Coast and in the Vale of Glamorgan.

4. Key objectives and principles

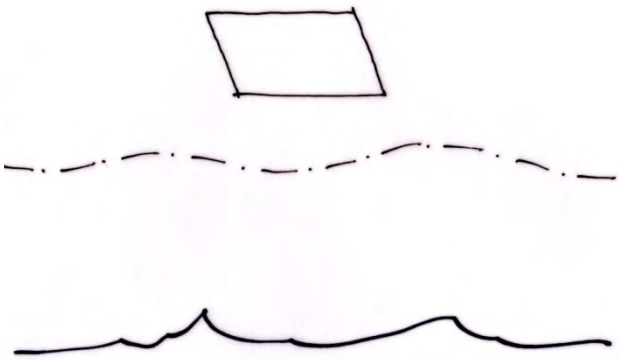
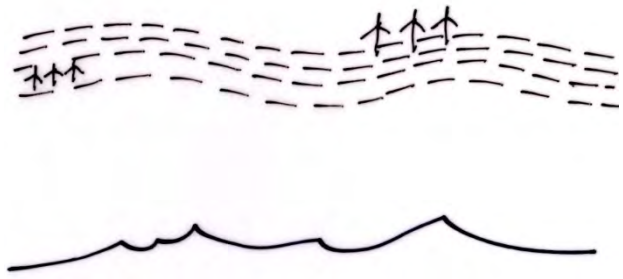
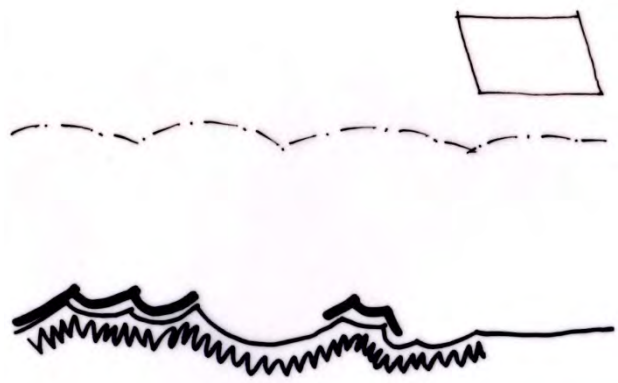
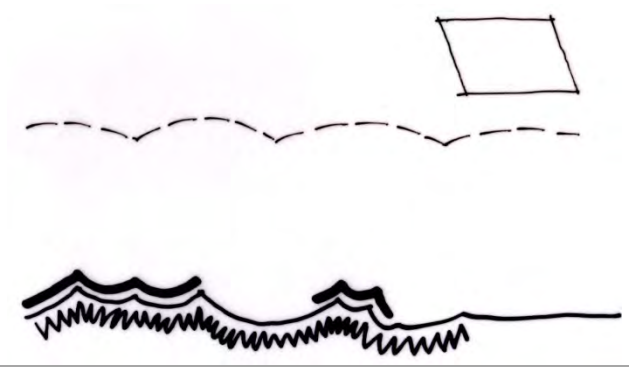
The key objectives underpinning this guidance are:

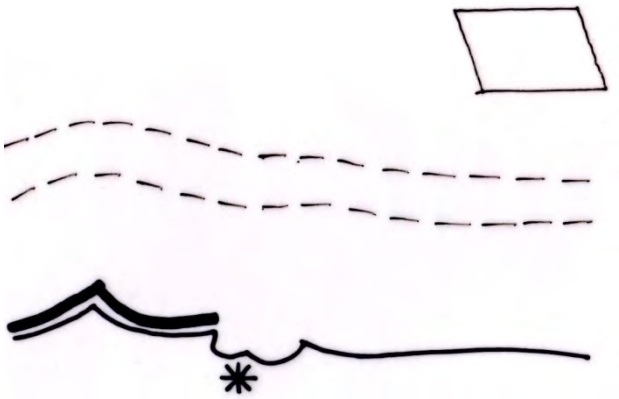
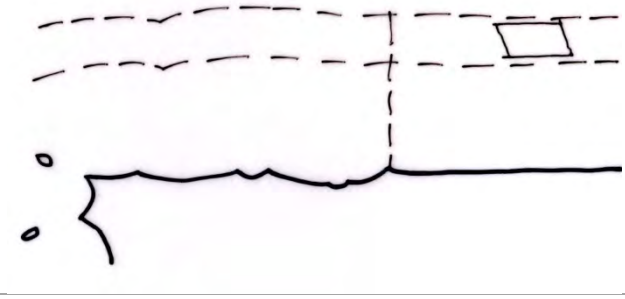
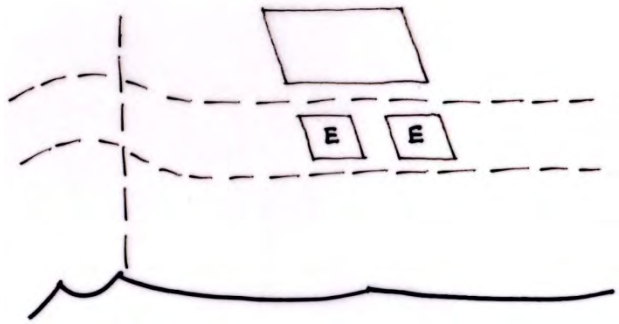
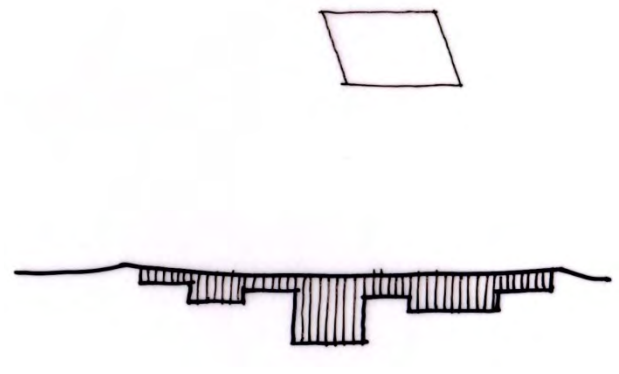
- Maintain the integrity and quality of landscape character within National Parks and AONBs.
- Avoid, or at least minimise, significant effects on sensitive seascape and visual receptors.

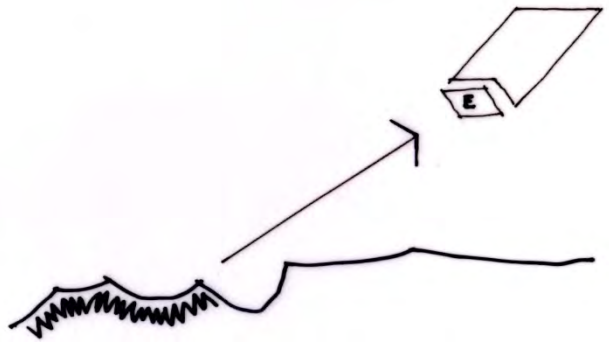
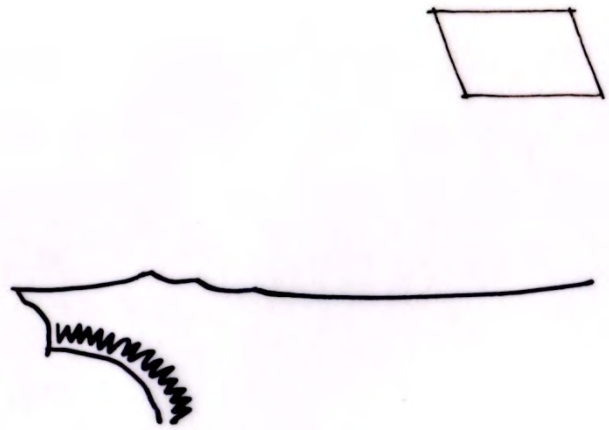
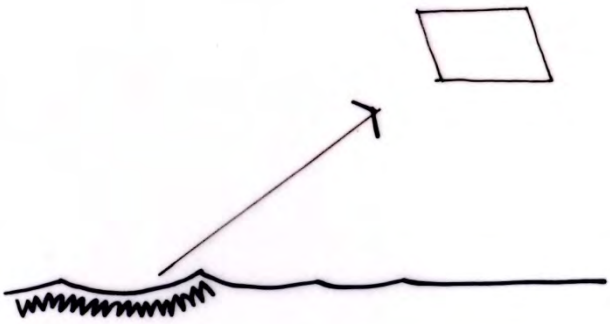
The following principles set out the approach to achieve the above objectives. All principles are important and should be taken into account and should be read together. For instance, if a proposed location is off an industrialised coast but also close to a sensitive designated coast, the latter must be taken into account. Most weight is attached to the effects on national landscape designations (National Parks and AONBs).

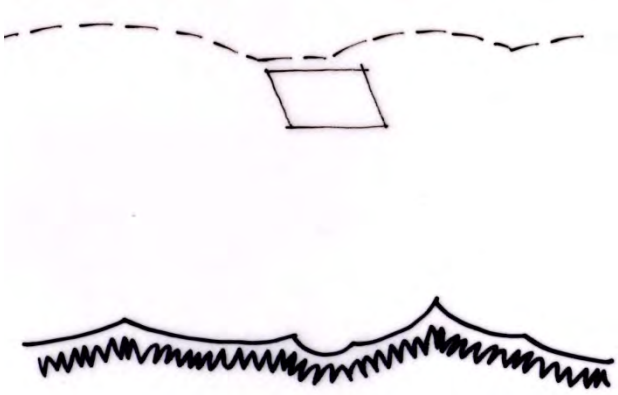
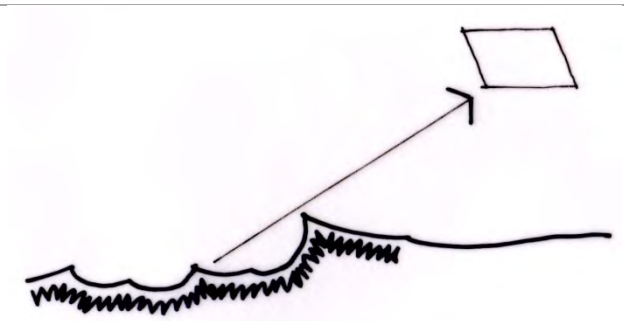
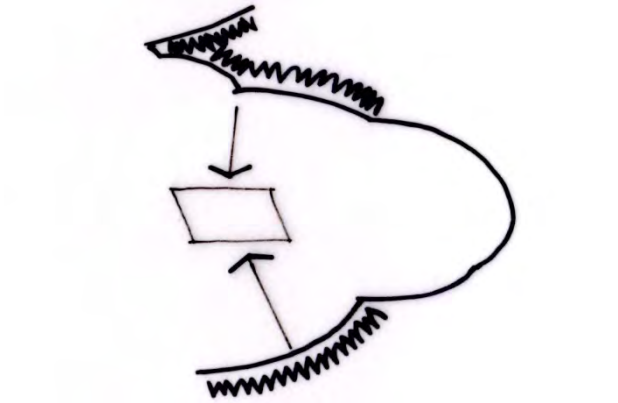
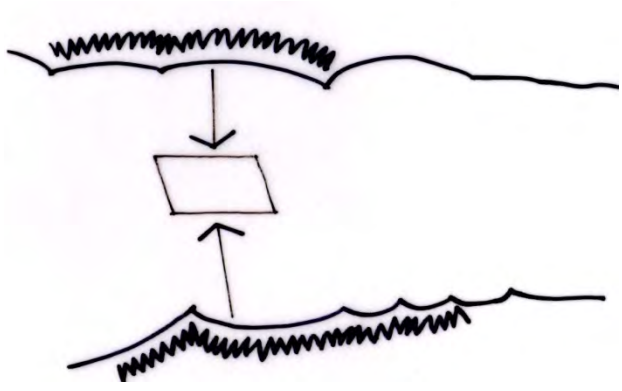
It is assumed that, at a substantial distance offshore, natural and cultural constraints can be dealt with by micrositing turbines. It is also assumed that views from passing mariners are less sensitive than from coastal receptors. Therefore, there is an emphasis on the perceptual and visual effects on coastal receptors.

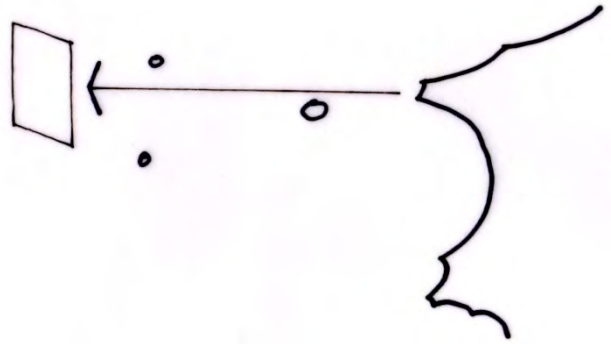
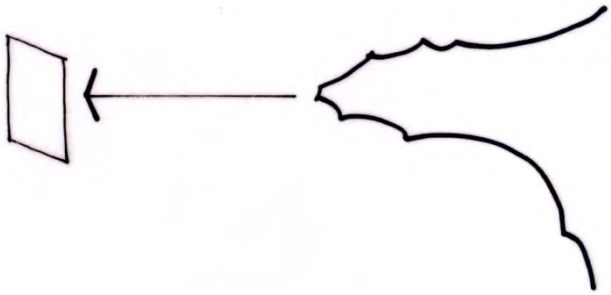
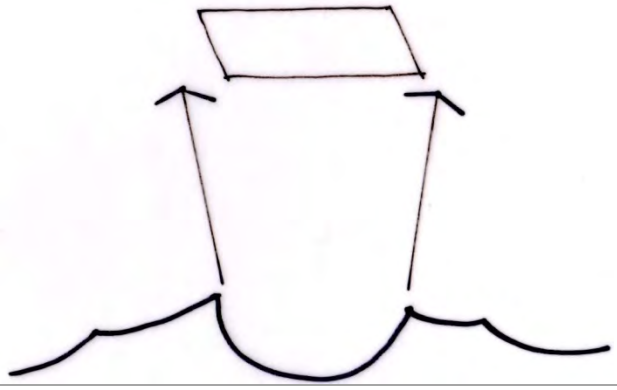
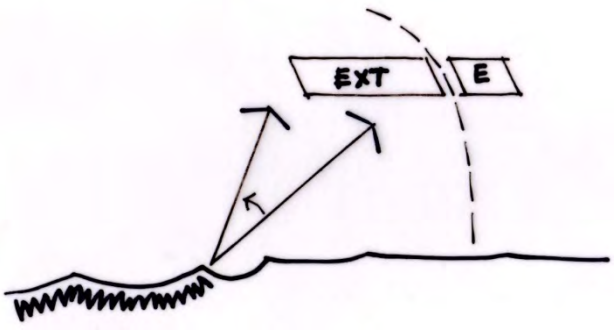
Table 4.1 Measures to avoid or minimise seascape and visual effects

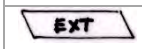
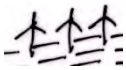
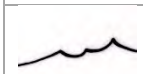
Headline principle	Principle	Illustration
		DO's
Locate development as far away from the coastline as possible	**1. Locate** developments beyond the limit of negligible visual effects.	
	2. If above not possible, **locate** using visual buffer distances in Stage I report to inform distances for the highest potential turbine proposed from high sensitivity receptors (low magnitude of effect) and other receptors (medium magnitude of effect).	
Locate development particularly away from coastal landscape designations.	**3. Locate** developments beyond the limit of negligible visual effects, particularly for the highest sensitivity National Parks/AONBs overlaid with Heritage Coasts.	
	4. If above not possible, **locate** developments beyond the Stage I report low magnitude buffer distances for the highest potential turbine proposed from National Parks and AONBs.	

Headline principle	Principle	Illustration
		DO's
	5. Locate developments as far away from Heritage Coasts and World Heritage Sites as possible- use the low magnitude of effect buffer distances for the highest potential turbine proposed.	
Locate development in lower sensitivity seascapes.	**6. Locate** developments in areas identified as lower sensitivity in the Stage 3 report.	
	7. Locate developments in areas offshore from local seascape character areas identified as having lower inherent sensitivity characteristics (see **Table 7.1** factors affecting the sensitivity of seascape character areas).	
Locate development off already industrialised or developed coastlines	**8.** Providing above principles followed.	

Headline principle	Principle	Illustration
		DO's
Locate development in areas with existing offshore wind farms	**9. Locate** developments so as not to cause undue combined cumulative impact on existing landscape and visual receptors.	
Use headlands and development siting to minimise visibility	**10.** Use headlands in particular to screen development from more sensitive coasts and receptors.	
Design windfarms to minimise effects on sensitive receptors using DTI, 2005 guidance	**11.** For example: Orientate the windfarm to expose the narrowest part of the array to the most sensitive receptors.	

Headline principle	Principle	Illustration
		DON'TS
Locate development away from coastal landscape designations.	**12. Avoid** developments directly off shore from coastal designations.	
	13. But **avoid** developments being visible in juxtaposition with sensitive views to headlands	
	14. Particularly avoid developments within buffer distances of several separate designations- Example 1	
	15. Particularly avoid developments within buffer distances of several separate designations- Example 2	

Headline principle	Principle	Illustration
		DON'TS
Locate development away from higher sensitivity seascapes and receptors.	**16. Avoid** locating developments in areas offshore from local seascape character areas identified as having higher inherent sensitivity characteristics (see **Table 7.1** factors affecting the sensitivity of seascape character areas) Example 1- **avoid** locations offshore from islands	
	17. Example 2- **avoid** locations offshore from remote headlands/peninsulas	
	18. Example 3- **avoid** locations filling or almost filling framed views	
Avoid significant cumulative impacts.	**19. Avoid** potential cumulative impact by extending width of arrays visible through extensions for additional wind farms	

Key	
	Proposed offshore wind farm
	Existing offshore wind farm
	Extension to existing offshore wind farm
	Indicative proposed wind farm array
	Likely limit of negligible visual effect
	Minimum visual buffer distance for turbine height or zone boundary
	Coastline
	National Park or AONB on the coast
	Heritage Coast
	Heritage feature
	Urban area

5. Checklist to minimise seascape and visual effects

The following checklist of questions should be followed to confirm if the principles in Section 4 have been applied successfully. It also links the principles with key documents.

Table 5.1 Checklist to minimise seascape and visual effects

Factor	Document/source	Test
Visual effects of offshore turbine size	Offshore windfarms in Wales Stage I report: Visual Effects Ready Reckoner, 2019 Figure 3	Is the proposed development beyond the low magnitude buffer distance for the maximum expected turbine height to blade tip eg beyond 22.6km for turbines up to 145m high, beyond 28.5km for turbines 176–225m high or beyond 44km for turbines 301-350m high?
Seascape and visual sensitivity to offshore wind farms	Offshore windfarms in Wales Stage 3 report: Sensitivity and visual assessment, 2019 Part 2	Is the proposed development in a zone or part of a zone which has a low enough sensitivity to accommodate the height of turbines and extent of development?
Seascape and visual sensitivity to offshore wind farms	Offshore windfarms in Wales Stage 2 report: Guidance for siting, 2019 Table 4.1	Does the proposed development comply with the principles?
National Parks and AONBs	National Parks and AONBs management plans, relevant planning policies (and Lle)	Does the proposed development avoid adversely affecting the purposes of the designations and their special qualities?
Heritage Coasts	Heritage Coasts locations (Lle)	Does the proposed development avoid adversely affecting National Parks and AONBs overlaying Heritage coasts?
	Heritage Coasts locations and policies	Does the proposed development avoid adversely affecting the enjoyment of the Heritage Coasts?
Heritage designat-ions	Cadw, Coflein and Lle	Does the proposed development avoid adversely affecting visual setting of World Heritage Sites and other historic designations such as scheduled monuments and Conservation Areas?
LANDMAP Visual and Sensory	Lle and NRW websites	Does the proposed development avoid adversely affecting areas of Outstanding or high value intervisible with the sea?
Recreation and access	Lle	Does the proposed development avoid significant adverse effects on the Wales Coast Path, identified important viewpoints and areas of open access

		land?
Factor	**Document/source**	**Test**
Cumulative effects	The Crown Estate website	Does the proposed development complement and take into account the size and arrangement of existing or consented developments?
	The Crown Estate website	Does the proposed development avoid significant combined cumulative effects with existing or consented developments?

In relation to the seascape and visual impact assessment (SVIA) process it is important that a series of location and size options are considered at the site search stage and seascape and visual impact is taken fully into account before preferred options are firmed up. The following table suggests the involvement of NRW and other authorities in the process.

Table 5.2 EIA/SVIA process

EIA/SVIA process[3]	**Notes**
Screening	A statutory EIA is likely to be required
Scoping	Early consultation with NRW[4] and relevant national landscape designations authorities on seascape and visual matters. Consider a series of alternative locations and arrangements for assessment- avoid taking forward one option only. Sometimes a 'Rochdale Envelope' approach is helpful (where the nature and extent of the development is defined as parameters or limits rather than as an exact proposal). This allows principles to be considered while still allowing for some flexibility for different layout options and micrositing to evolve further through the development process.
Establishing the baseline	NRW can assist in setting out the key baseline evidence sources to be taken into consideration as context.
Identify and describe likely effects	Preliminary Environmental Information Report should include effects of windfarm against baseline of existing development and combined cumulative effects- consultation with NRW and relevant consultees
Mitigation proposals	Consider relocating to avoiding effects or, if this is not possible, to minimise effects through an iterative siting and design process
Environmental Statement/SVIA	Prepare SVIA including cumulative effects and send to NRW and other relevant landscape consultees for comment. Finalise design of development and SVIA.

[3] See Guidelines for Landscape and Visual Impact Assessment, Edition 3, LI/IEMA, 2013. Figure 3.1 page 29.
[4] Note that, at the time of publication, NRW have a limit on the number of hours that can be spent on non-statutory advice before charges are payable.

Appendices

Appendix A: Policy Context

6. Policy Context

6.1. Wales Policies

The Well-being of Future Generations (Wales) Act 2015 aims to improve the long term social, economic and environmental and cultural well-being of Wales. It covers all of Wales and the inshore marine planning region.

Planning Policy Wales (PPW10) states that NRW is responsible for ensuring that statutorily designated sites are properly protected and managed. It states that great weight should be given to the purposes of National Parks and AONBs including conserving and enhancing their natural beauty and their special qualities in development planning. This applies to both activities that lie within, or in the setting, of the designated area (6.3.5-6.3.9).

PPW10 indicates that the character of undeveloped coastlines should be protected or enhanced. While Heritage Coast itself is not a statutory designation, local planning authorities do recognise and attach local policies to such areas. The features which contribute to their recognition as Heritage Coast will be important considerations in development management decisions.

The Marine and Coastal Access Act (2009) provides the framework for marine planning in Wales and across the UK. It sets Welsh Ministers as the Marine Plan authority for the Welsh Inshore and Offshore regions. The UK Marine Planning Policy Statement (MPS) provides the framework for preparing marine plans including the Welsh National Marine Plan.

6.2. Draft Welsh National Marine Plan

The Welsh National Marine Plan is currently at a draft stage. It has a policy on Seascapes which states that, in order of preference, proposals should avoid adverse impacts on seascapes, minimise impacts where they cannot be avoided and mitigate impacts where they cannot be minimised. Appropriate siting is stated as the first priority. National Marine Character Areas which divide up and describe the seascape of the inshore region are referenced.

The Designated Landscapes policy states that proposals that demonstrate they are compatible with the purposes and special qualities for which National Parks and AONBs have been designated are encouraged. The Historic Assets policy concerns the early consideration of the potential impacts on historic assets and their settings.

The draft Welsh National Marine Plan supports (where appropriate) further commercial development of offshore wind over the next 5 to 10 years (page 179) but does not allocate specific resource areas for wind. The Low Carbon Energy policy states that proposals for wind energy are strongly encouraged. In order to understand future opportunities relevant public authorities should, in liaison with the sector and other interested parties, collaborate to:

- Collect evidence to support understanding of environmental constraints and opportunities.

- Support understanding of optimal sites and offshore wind developments across Wales.

6.3. UK National Policy Statements

The UK Government produces National Policy Statements (NPSs) under the Planning Act (2008) which sets out Government policy for the development of Nationally Significant Infrastructure Projects (NSIPs). National policy statements EN-1 and EN-3 address national infrastructure planning in relation to renewable energy including offshore wind farms with an output above 100MW but are a material consideration for smaller projects.

EN-1 states that virtually all nationally significant energy infrastructure projects will have effects on the landscape/seascape. Projects need to be designed carefully taking account of the potential impacts. The aim should be to minimise harm, providing reasonable mitigation where possible and appropriate (5.9.8). It reasserts that National Parks and AONBs have been confirmed as having the highest status of protection in relation to landscape and scenic beauty. Each of these designated areas has specific statutory purposes which help to ensure their continued protection and which the decision-maker should have regard to in its decisions. The conservation of the natural beauty of the landscape and countryside should be given substantial weight by the decision-maker in deciding on applications for development consent in these areas. The same test applies to projects outside the designation boundaries which may have impacts within them (5.9.12). Therefore both offshore wind farms and associated land-based infrastructure need to take this into consideration. The aim should be to avoid compromising the purposes of designations whether within England or Wales.

Outside nationally designated areas, landscapes may be highly valued locally and protected by local landscape designation. However, these factors in themselves should not be used to refuse consent. The decision maker should judge whether any adverse impact is so damaging that it is not offset by the benefits of the project.

EN-3 considers the seascape and visual effects of offshore windfarms in more detail. It sets out three principal considerations on the likely effect of offshore windfarms on the coast:

- Limit of visual perception from the coast
- Individual characteristics of the coast which affect its capacity to absorb a development
- How people perceive and interact with the seascape (2.6.203).

In terms of mitigation, it states that neither the design or scale of individual wind turbines can be changed without significantly affecting the output of the development so, instead, the layout of the turbines should be designed appropriately to minimise harm (2.6.210).

For smaller projects (below 100 MW) the Marine and Coastal Access Act (2009) indicates that decisions are made by the Marine Plan Authority (MPA) – in this case, Welsh Ministers. When considering the impact of an activity it states that the MPA

should take into account existing character and quality, how highly it is valued and its capacity to accommodate change (2.6.5.3).

6.4. National Parks and AONBs

The 1949 National Parks and Access to the Countryside Act, formed the basis for designating National Parks and AONBs. The Environment Act 1995 revised the original legislation and set out two statutory purposes for national parks in England and Wales:

- Conserve and enhance the natural beauty, wildlife and cultural heritage
- Promote opportunities for the understanding and enjoyment of the special qualities of national parks by the public

When national parks carry out these purposes they also have the duty to:

- Seek to foster the economic and social well-being of local communities within the national parks

For AONBs, the primary purpose of the designation is to conserve and enhance natural beauty. In pursuing the primary purpose of the designation, account should be taken of the needs of agriculture, forestry and other rural industries and of the economic and social needs of local communities.

Appendix B: Factors influencing seascape sensitivity

7. Factors influencing seascape sensitivity

The factors or indicators which make seascape character areas more or less sensitive to specific offshore windfarm developments when considered at a detailed scale are explored below. These are developed from Guidance on the Assessment of the Impact of Offshore Windfarms: seascape and visual impact report, DTI, 2005, and local seascape character assessments in Pembrokeshire and Carmarthen Bay, Gower and Swansea Bay.

Table 7.1 Factors affecting the sensitivity of seascape character areas

Criteria	Indicators of higher sensitivity	Indicators of lower sensitivity
Contribution to the setting of a coast or seascape character area	Is perceived from, and forms the setting of, a sensitive coast or seascape character area within the limits of visual perception. (See sensitivity criteria below).	Is perceived from a less sensitive coast or seascape character area. Is beyond the limits of visual perception.
Heritage features	Substantial presence of wrecks and other submerged historic features. Presence of coastal and island historic features such as forts, castles, chapels, monasteries, other buildings and structures and other heritage features which have a strong relationship with the coast and sea visually, physically or culturally.	Limited number or no heritage features
Nature Conservation features	Presence of marine habitats with high biodiversity. Presence of intertidal and coastal edge habitats with high biodiversity. Presence of BAP species or habitats.	Limited range and extent of biodiverse areas.
Cultural associations	Where there are strong collective cultural associations with the sea and coast through people and events and their expression through literature, art, music or other media. These can include religious connections, military connections, legends, books and poems, pictures, music, films, plays and other cultural media.	Where there are limited cultural associations.
Scale	Small scale, enclosed, views to horizon limited by landform Introduction of an element of scale into previously un-scaled area	Large scale views
Openness and enclosure	Where openness is a key characteristic and introduction of built elements would compromise this.	Unframed open views unimpeded by natural elements or features.

Criteria	Factors that add to sensitivity	Factors that detract from sensitivity
Coastal and hinterland form	Intricate, complex, rugged forms and dramatic headlands/ends of peninsulas Where great simplicity is the key characteristic and introduction of structures into very horizontal composition would compromise this.	Flat, horizontal or gently undulating or largely straight coast. Simple forms Plateau or flat hinterland.
Settlement/ Development pattern and foci	Small scale, traditional, historic settlements, harbours and monuments. Small clustered villages. Lack of infrastructure	Modern ports, industrial facilities, with larger scale infrastructure, urban form, linear settlements
Seascape pattern and foci	Complex or unified pattern which would be disrupted by development. Important focal points eg islands, islets, headlands, distinctive sweeping beaches, and high hills. Open unspoilt views of the sea with no signs of development offshore.	Lack of intact pattern Lack of natural focal points Presence of existing vertical or other elements at sea including shipping/ferries.
Movement	Where stillness is a key feature either naturally (eg through aspect or tidal conditions) or due to lack of movement associated with transport, development or people. Where/when movement is highly natural, irregular or dramatic (currents, tidal streams, waves crashing on exposed coastlines) and regular mechanical movement or presence of development would detract.	In busier areas where development movement relates to other forms of mechanical movement present e.g. commercial shipping, ferries, boats, cars, lorries, aircraft or to a lesser extent other movement eg crowded swimming and surfing beaches Where/when waves are gentler and slow, regular movement of development could complement lapping of waves. Where clear current gives meaning/purpose to tidal renewable energy.

Criteria	Factors that add to sensitivity	Factors that detract from sensitivity
Dark skies/ Lighting	Where the area is unlit at night and is classified as such in a dark skies study. Little impact of lights from sea and land traffic. Where lighting is from scattered small settlements, lighthouses etc, and is minimal and isolated, and where larger scale, more geometric patterns of lighting from marine development would change this character	Coast is already well lit at night Lights of sea and land traffic or installations present.
Aspect	Development would interfere with notable views of sunrises and particularly sunsets. Where turbines would be highlighted in contrast to their background by sun light or be highlighted in silhouette from backlighting, thereby increasing visual prominence. Development seen from higher level views, particularly where viewer elevation results in development, and its geometric layout pattern, being seen much closer than on the horizon line.	Development located away from sunrise and sunset positions
Visual and sensory: How seascape is experienced	From remote or little used stretch of sea with little shipping or boat use. From secluded coastline, intimate coastal roads and footpaths. From important viewpoints and elevated positions where the focus is the view and not the activity. Popular beaches where the focus is fully or partly on seascape views, qualities and character.	From ferry/shipping. From main coastal, busy roads. Crowded beaches where focus is on beach activities,(rather than enjoyment of seascape character) .
Visual and sensory: Remoteness, Tranquillity, Wildness	Undeveloped seascape Wild character Highly natural, unmanaged Remote or isolated Tranquil	Highly developed seascape Highly modified / managed. Not remote Lacking in tranquillity
Exposure	Sheltered and calm seascapes Where seascape is extremely exposed such that the perceived wild, elemental nature is a key characteristic and development would significantly change this perception.	Open, exposed seascapes which does not provide a perception of elemental or wild seascape character and development would be perceived as relating to these characteristics.

Appendix C: Bibliography

8. Bibliography

The most relevant guidelines and reports taken into consideration in this guidance are as follows:

- Countryside Council for Wales. Briggs and White. January 2009, Welsh seascapes and their sensitivity to offshore developments, CCW Policy Research Report No. 08/5.
- Council of Europe. 2000. European Landscape Convention.
- Countryside Agency. 2002. Topic Paper 6 - concerning strategic landscape sensitivity and capacity.
- DECC. March 2011. UK Offshore Energy Strategic Environmental Assessment 2.
- DECC. March 2016. UK Offshore Energy Strategic Environmental Assessment 3.
- DTI. BMT Cordah. 2003. Offshore Wind Energy Generation: Phase 1 proposals and environmental report.
- DTI. 2005. Guidance on the Assessment of the Impact of Offshore Windfarms: seascape and visual impact report.
- IEMA. 2011. IEMA Special Report – The state of environmental impact assessment practice in the UK.
- LI and IEMA. 2013. Guidelines for Landscape and Visual Impact Assessment. Edition 3, (GLVIA 3).
- LUC. November 2015. National Seascape Assessment for Wales. NRW Evidence Report No: 80.
- Natural England. 2012. An approach to Seascape Character Assessment. (NECR105).
- Scottish Natural Heritage. 2005. An assessment of the sensitivity and capacity of the Scottish seascape in relation to offshore windfarms (Commissioned report 103).
- Scottish Natural Heritage. March 2012. Offshore renewables- guidance on assessing the impact on coastal landscape and seascape - informing scoping assessments.
- White Consultants. April 2013. Pembrokeshire Coast National Park Local Seascape Character Assessment.
- White Consultants. November 2017. Carmarthen Bay, Gower and Swansea Bay Local Seascape Character Assessment.

Published by:
Natural Resources Wales
Address line one
Address line two
Address line three
Post Code

0000 000 000

Further copies of this report are available from:

Email: library@cyfoethnaturiolcymru.gov.uk

Cyfoeth Naturiol Cymru
Natural Resources Wales

Seascape and visual sensitivity to offshore wind farms in Wales:

Strategic assessment and guidance

Stage 3- Seascape and visual sensitivity assessment for offshore wind farms

Simon White, Simon Michaels and Helen King, White Consultants

Report No 331

www.naturalresourceswales.gov.uk

About Natural Resources Wales

Natural Resources Wales' purpose is to pursue sustainable management of natural resources. This means looking after air, land, water, wildlife, plants and soil to improve Wales' well-being, and provide a better future for everyone.

Evidence at Natural Resources Wales

Natural Resources Wales is an evidence based organisation. We seek to ensure that our strategy, decisions, operations and advice to Welsh Government and others are underpinned by sound and quality-assured evidence. We recognise that it is critically important to have a good understanding of our changing environment.

We will realise this vision by:

- Maintaining and developing the technical specialist skills of our staff;
- Securing our data and information;
- Having a well resourced proactive programme of evidence work;
- Continuing to review and add to our evidence to ensure it is fit for the challenges facing us; and
- Communicating our evidence in an open and transparent way.

This Evidence Report series serves as a record of work carried out or commissioned by Natural Resources Wales. It also helps us to share and promote use of our evidence by others and develop future collaborations. However, the views and recommendations presented in this report are not necessarily those of NRW and should, therefore, not be attributed to NRW.

Report series:	NRW Evidence Series
Report number:	331
Publication date:	March 2019
Contract number:	N/A
Contractor:	White Consultants: Environment Ltd in association with the University of Northumbria
Contract Manager:	L. Skates
Title:	**Seascape and visual sensitivity to offshore wind farms in Wales: Strategic assessment and guidance. Stage 3- Seascape and visual sensitivity assessment for offshore wind farms**
Author(s):	**White, S. Michaels, S. King, H**.
Restrictions:	None

Distribution List (core)

NRW Library, Bangor	2
National Library of Wales	1
British Library	1
Welsh Government Library	1
Scottish Natural Heritage Library	1
Natural England Library (Electronic Only)	1

Distribution List (others)

Will be circulated to relevant parties electronically

Recommended citation for this volume:

White, S. Michaels, S. King, H. 2019. Seascape and visual sensitivity to offshore wind farms in Wales: Strategic assessment and guidance. Stage 3- Seascape and visual sensitivity assessment for offshore wind farms. NRW Evidence Series. Report No: 331, 96pp, NRW, Bangor.

Contents

List of Figures

1. Crynodeb Gweithredol

1.1. Cefndir a briff

Ym mis Tachwedd 2018, penodwyd White Consultants gan Gyfoeth Naturiol Cymru (CNC) i gynnal asesiad strategol a pharatoi canllawiau ar gyfer sensitifrwydd morwedd a gweledol i ffermydd gwynt ar y môr yn ardaloedd Cynllun Morol drafft Cymru.

Mae i'r prosiect dair rhan ac, er cyflawnrwydd, dylid ystyried y rhain gyda'i gilydd. Yr adroddiad hwn yw'r drydedd ran ac mae'n cynnwys asesiad o sensitifrwydd morwedd.

Roedd y briff yn gofyn am asesiad desg gofodol syml o forwedd Cymru ar gyfer tyrbinau o wahanol uchderau hyd at 350m o uchder gan roi ystyriaeth i ardaloedd sydd wedi'u mapio'n barod fel Parciau Cenedlaethol ac Ardaloedd o Harddwch Naturiol Eithriadol (AHNEoedd), ardaloedd cymeriad morwedd (sy'n gyfyngedig i ardaloedd gyda'r glannau – hyd at 12 milltir forol) a gwaith mapio gweledol presennol yn cynnwys yr ymchwil cyfrifydd parod (Cam 1 o'r astudiaeth hon).

Y prif ysgogwyr polisi yw'r Datganiadau Polisi Cenedlaethol EN-1 ac EN-3. Mae'r rhain yn ymdrin â chynllunio seilwaith cenedlaethol mewn perthynas ag ynni adnewyddadwy, yn cynnwys ffermydd gwynt ar y môr ag allbwn sydd uwchlaw 100MVW. Cydnabyddir bod gan dirweddau a ddynodwyd yn genedlaethol y statws uchaf o warchodaeth a dylid rhoi ystyriaeth i'w dibenion statudol.

1.2. Dull Gweithredu

Y nod yw osgoi effeithiau andwyol sylweddol ar dderbynyddion morwedd sensitif iawn. Y rhagosodiad yw mai'r effaith bwysicaf o ran ffermydd gwynt ar y môr yw'r effaith ar y canfyddiad o gymeriad morwedd o'r arfordir neu'r ynysoedd cysylltiedig h.y. y berthynas rhwng unrhyw ddatblygiad arfaethedig a chymeriad morwedd arfordirol pan ystyrir eu bod mewn cyfosodiad â'i gilydd. Mae hyn yn golygu mai'r prif ysgogwyr yw'r pellter oddi ar yr arfordir a chymeriad a gwerth y forwedd arfordirol a'i derbynyddion sensitif cyfansoddol. Felly cafodd gwahanol barthau morwedd eu clustnodi at y diben hwn yn unig – ni ddylent gael eu defnyddio at ddibenion eraill lle gallai fod angen cynnal cymeriadaeth lawn o forwedd gan roi ystyriaeth i brosesau naturiol a diwylliannol cynhenid a nodweddion eraill.

Mae'r astudiaeth gyffredinol yn canolbwyntio'n bennaf ar y byfferau argymelledig posibl ar gyfer Parciau Cenedlaethol ac AHNEoedd. Fodd bynnag, rhoddir ystyriaeth i dderbynyddion sensitif eraill yn y rhan hon o'r astudiaeth gan eu bod yn cyfrannu at gymeriad morwedd a'r canfyddiad ohoni. Mae'r rhain yn cynnwys Arfordiroedd Treftadaeth, Safleoedd Treftadaeth y Byd a nodweddion fel henebion rhestredig e.e. caerau arfordirol.

Mae'r forwedd wedi'i rhannu'n bymtheg parth ar sail:

- Ehangder y byfferau gweledol sy'n gysylltiedig â'r ardaloedd tirwedd dynodedig – mae'r rhain yn pennu pellterau'r parthau oddi wrth yr arfordir.

- Presenoldeb ffermydd gwynt presennol, neu beidio, sy'n effeithio ar gymeriad morwedd.
- Geometreg arfordir Cymru, gan roi ystyriaeth i'r prif bentiroedd, prif faeau a chymeriad yr arfordir.

Dangosir y parthau yn Ffigur 1.

1.3. Asesiad o sensitifrwydd

Mae sensitifrwydd parth i ffermydd gwynt ar y môr yn seiliedig ar gyfres o feini prawf sy'n cydymffurfio â'r canllawiau a baratowyd yng Ngham 2. Mae'r meini prawf yn grwpio'r ffactorau yn werth, rhagdueddiad morwedd a rhagdueddiad gweledol. Rhoddir crynodeb o sensitifrwydd pob parth mewn perthynas â datblygu ffermydd gwynt ar y môr, ac mae'n cynnwys argymhellion i leihau eu heffeithiau gweledol.

Rhoddir diffiniad isod o'r trothwyon ar gyfer sensitifrwydd tirwedd a gweledol. Mae'r raddfa pum pwynt yn adlewyrchu'r gwahaniaeth main rhwng cymeriad pob morwedd.

Lefel	*Diffiniad*
Isel	Mae nodweddion gweledol ac/neu forwedd y parth yn gadarn neu wedi'u diraddio ac/neu mae ei werthoedd yn isel a gall ymaddasu i'r math perthnasol o ddatblygiad heb newid ei gymeriad yn sylweddol neu weld effeithiau andwyol. Mae'r trothwyon ar gyfer newid sylweddol yn uchel iawn.
Canolig/ isel	Mae nodweddion gweledol ac/neu forwedd y parth yn gallu gwrthsefyll newid ac/neu mae ei werthoedd yn ganolig/isel neu'n isel a gall ymaddasu i'r math perthnasol o ddatblygiad mewn llawer o sefyllfaoedd heb newid ei gymeriad yn sylweddol neu weld effeithiau andwyol. Mae'r trothwyon ar gyfer newid sylweddol yn uchel.
Canolig	Mae nodweddion gweledol ac/neu forwedd y parth yn gymedrol ragdueddol i newid ac/neu mae ei werthoedd yn amrywio o ganolig/isel i uchel/canolig ac/neu *gallai* fod iddo botensial i ymaddasu i'r math perthnasol o ddatblygiad mewn rhai sefyllfaoedd *diffiniedig* heb newid ei gymeriad yn sylweddol neu weld effeithiau andwyol. Mae'r trothwyon ar gyfer newid sylweddol yn ganolradd.
Uchel/ canolig	Mae nodweddion gweledol ac/neu forwedd y parth yn rhagdueddol i newid ac/neu mae ei werthoedd yn ganolig i uchel (er nad yw'r lefel hon o werth yn hanfodol pan fod rhagdueddiad gweledol ac/neu dirwedd yn faterion allweddol). Mae'n bosibl y gallai'r parth morwedd ymaddasu i'r math perthnasol o ddatblygiad, ond mewn sefyllfaoedd cyfyngedig yn unig, heb newid ei gymeriad yn sylweddol neu weld effeithiau andwyol. Mae'r trothwyon ar gyfer newid sylweddol yn isel.
Uchel	Mae nodweddion gweledol ac/neu forwedd y parth yn

	rhagdueddol iawn i newid ac/neu mae ei werthoedd yn uchel neu'n uchel/canolig ac mae'n methu ag ymaddasu i'r math perthnasol o ddatblygiad heb newid ei gymeriad yn sylweddol neu weld effeithiau andwyol. Mae'r trothwyon ar gyfer newid sylweddol yn isel iawn.

Rhoddir crynodeb isod o'r casgliadau sensitifrwydd morwedd a gweledol ar gyfer pob parth ac fe'u dangosir yn Ffigurau 7 ac 8.

Crynodeb o sensitifrwydd

Rhif yr Ardal:	Enw'r Ardal:	Sensitifrwydd
1	Gogledd Ddwyrain Cymru Gyda'r Glannau	Canolig
2	Gogledd Ddwyrain Cymru Ar y Môr	Canolig/isel
3	Gogledd Cymru a Gogledd Ynys Môn Gyda'r Glannau	Uchel
4	Gogledd Cymru a Gogledd Ynys Môn Ar y Môr	Canolig
5	Gogledd Cymru ac Ynys Môn Ar y Môr Allanol	Canolig/isel
6	Bae Caernarfon Gyda'r Glannau	Uchel
7	Bae Caernarfon Ar y Môr	Uchel/canolig
8	Bae Ceredigion, gogledd Gyda'r Glannau	Uchel
9	Bae Ceredigion, canolog Gyda'r Glannau	Uchel/canolig
10	Bae Ceredigion Ar y Môr	Uchel/canolig
11	Culfor San Siôr Ar y Môr	Canolig
12	Arfordir Sir Benfro Gyda'r Glannau a Bae Caerfyrddin	Uchel
13	Arfordir Sir Benfro Ar y Môr	Uchel/canolig
14	Y Môr Celtaidd	Canolig/isel
15	Môr Hafren ac Aber Afon Hafren	Uchel

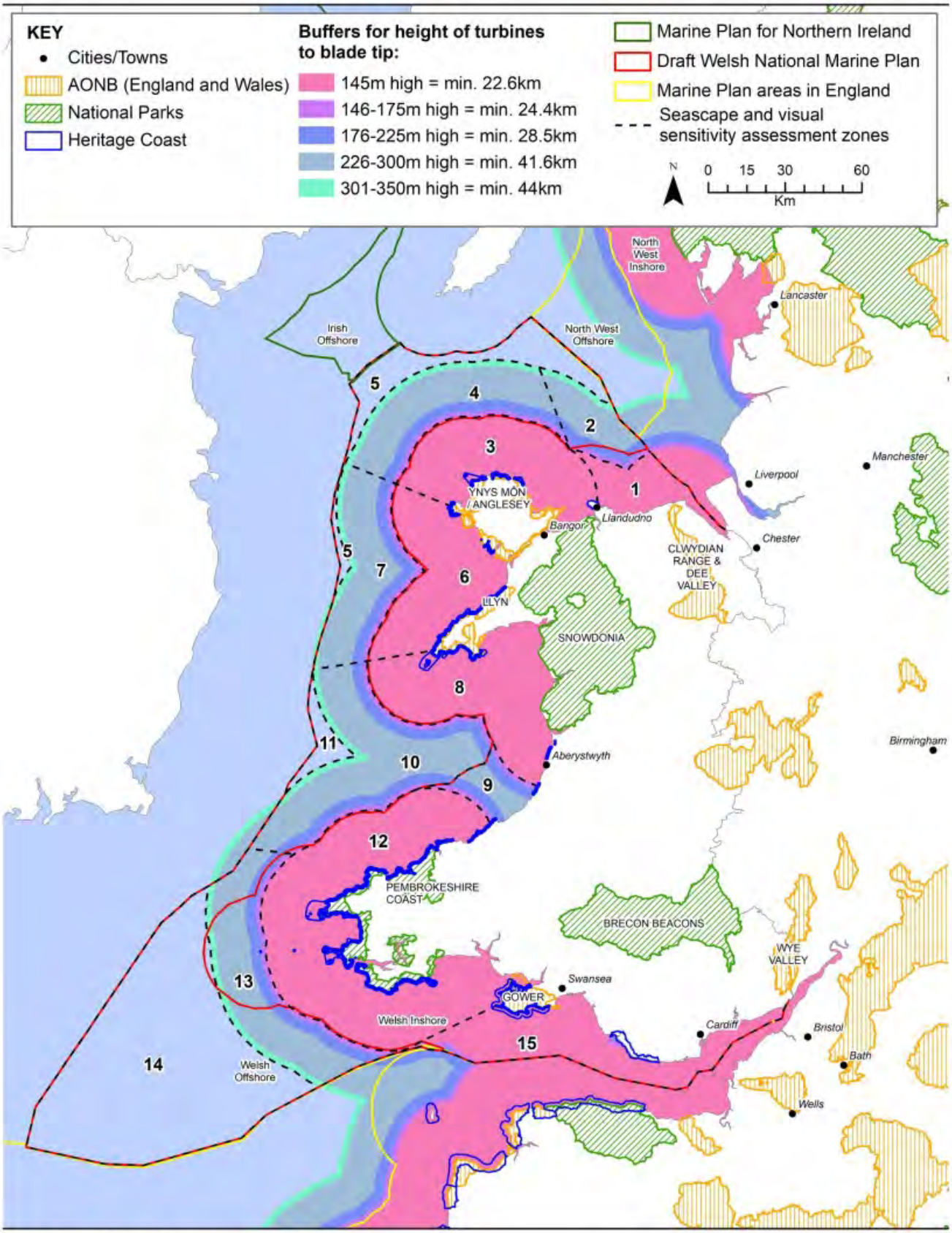
1.4. Casgliadau cyffredinol

At ei gilydd, mae morwedd Cymru yn sensitif iawn mewn llawer o ardaloedd gyda chyfran fawr ohoni o fewn lleoliad dynodiadau tirwedd cenedlaethol ac yn cyfrannu at eu nodweddion arbennig. Ystyrir y parthau mewn grwpiau o hyd at 22.6km, 22.6 – 44km, a thu hwnt i 44km oddi ar yr arfordir:

- Yn gyffredinol ystyrir bod y sensitifrwydd yn uchel ar gyfer **hyd at 22.6km** oddi ar y lan o ran datblygu ffermydd gwynt, ac eithrio arfordir y gogledd ddwyrain (**Parth 1**) sydd â datblygiad ffermydd gwynt presennol yn barod. Yma, gallai fod

posibilrwydd o estyniad bach o ran ffermydd gwynt ond mae'r cwmpas yn gyfyngedig.

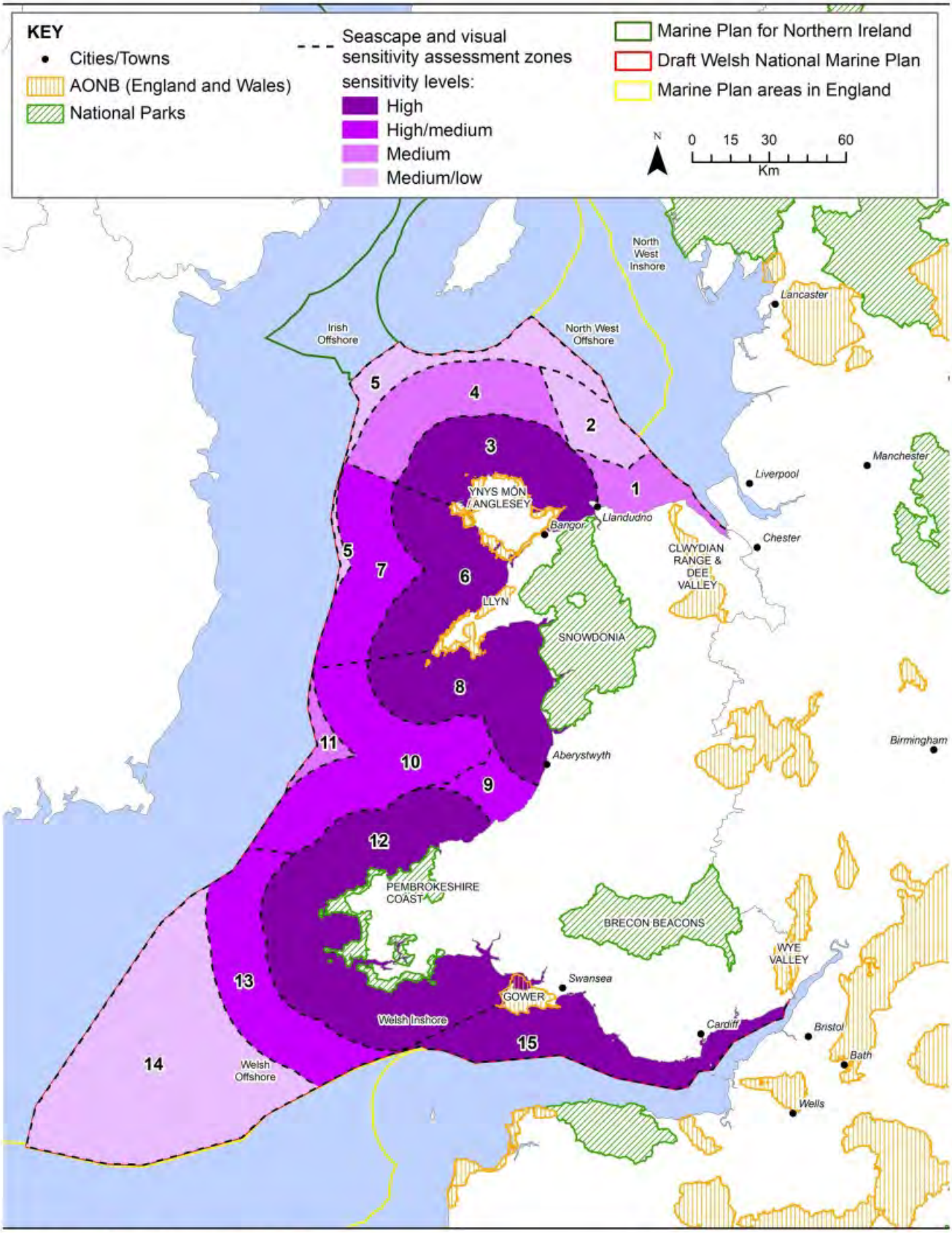
- Pan fydd **rhwng 22.6km a 44km** oddi ar y lan, mae'r lleoliad posibl ar gyfer ynni gwynt yn ddibynnol ar uchder y tyrbin ac ehangder tebygol y fferm wynt gyfan. Ym mharth 4, gallai datblygiad wedi ei ddylunio'n dda fod yn bosibl ac ym **Mharth 2** byddai datblygiad y tu hwnt i Wynt y Môr yn dueddol o gyfyngu ar y niwed. Mewn rhai ardaloedd, fel ar Arfordiroedd Sir Benfro a Llŷn, ystyrir bod caniatáu datblygiad yn y parthau hyn (**7, 10 a 13**) yn niweidiol gan fyddai'r datblygiad yn weladwy ac yn cael effaith andwyol ar y nodweddion arbennig, yn cynnwys lleoliad, llonyddwch a gwylltineb ymddangosiadol yr arfordiroedd gorllewinol anghysbell hyn.
- Mewn lleoliadau **y tu hwnt i 44km** oddi ar y lan, byddai effeithiau tyrbinau gwynt o bron bob maint yn gyfyngedig er y gallent fod yn weladwy dan amodau golau a thywydd penodol. Gallai datblygu ym **Mharth 5** fod yn bosibl yn enwedig i'r gogledd ddwyrain. Gallai datblygu ym **Mharth 11** fod yn bosibl er y byddai'n rhaid rhoi ystyriaeth ofalus iawn i'r effeithiau arfaethedig ar Ynys Enlli a phen pellaf penrhyn Llŷn. Mae'n debygol y byddai datblygu yn y rhan fwyaf o **Barth 14** yn bosibl er y gallai tyrbinau mawr yn yr ardaloedd agosaf at arfordir Sir Benfro a'i hynysoedd achosi niwed, unwaith eto oherwydd gweledded mewn amodau golau a thywydd penodol.



www.whiteconsultants.co.uk

Figure 1
Designated Landscape buffers - for low magnitude of visual effect for different wind turbine heights

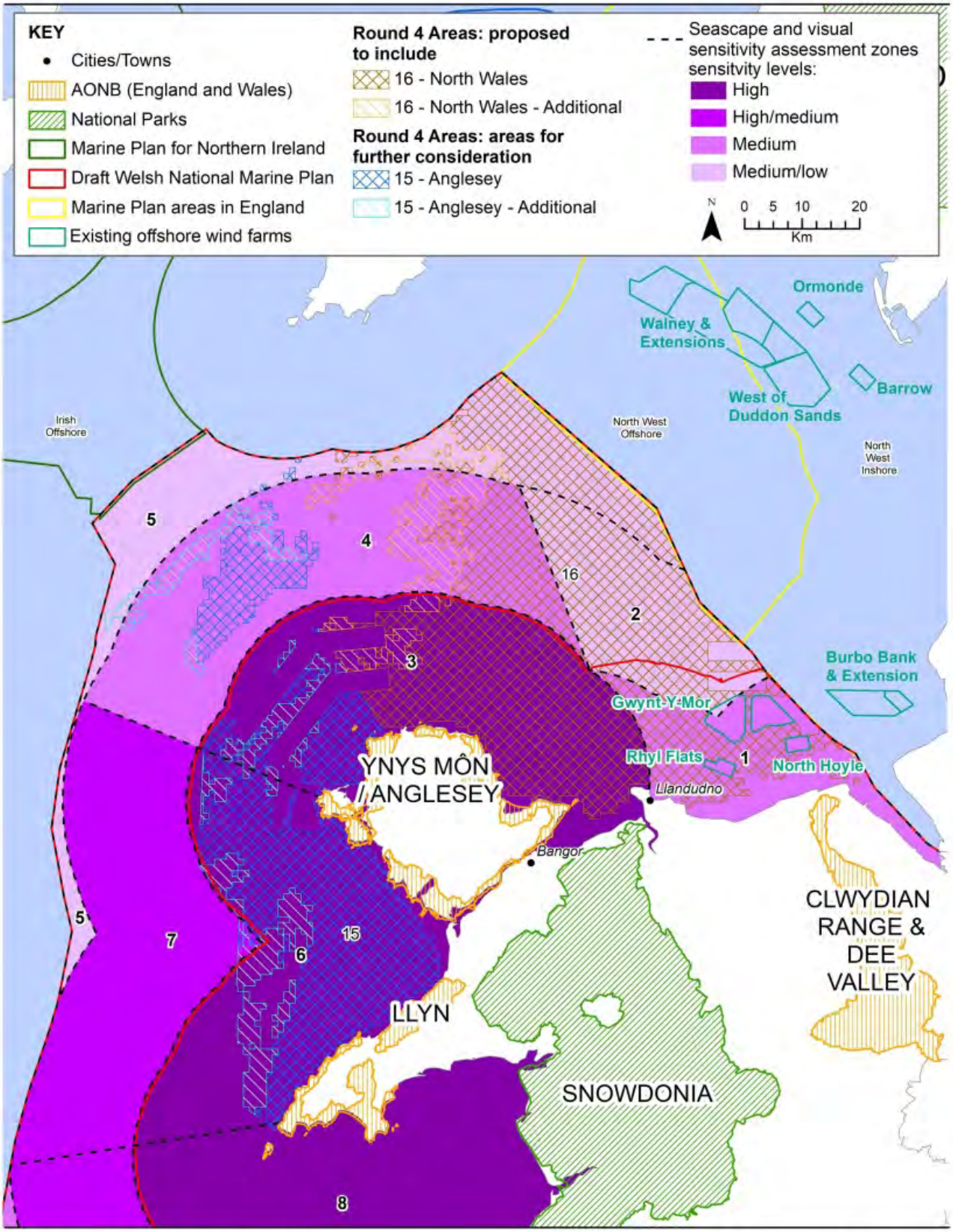
07/03/19 | v5 | Drawn: HK | Checked SW



www.whiteconsultants.co.uk

Figure 7
Designated landscapes, their seascape settings and their sensitivity to offshore wind farms

28/03/19 | v2 | Drawn: HK | Checked SW



www.whiteconsultants.co.uk

28/03/19 | v2 | Drawn: HK | Checked SW

Figure 8
Designated landscapes, their seascape settings and their sensitivity to offshore windfarms - off North Wales

2. Executive Summary

2.1. Background and brief

Natural Resources Wales (NRW) appointed White Consultants in November 2018 to undertake a strategic assessment and prepare guidance for seascape and visual sensitivity to offshore wind farms in Wales' draft Marine Plan areas.

The project is in three parts which for completeness should be considered together. This report is the third part and is the seascape sensitivity assessment.

The brief required a spatially simple desk-based assessment of the Welsh seascape for different heights of turbines up to 350m high taking into account existing mapped areas such as National Parks and Areas of Outstanding Natural Beauty (AONBs), seascape character areas (which are limited to inshore areas – up to 12nm) and existing visual mapping work including the ready reckoner research (Stage 1 of this study).

The main policy drivers are National Policy Statements EN-1 and EN-3. These address national infrastructure planning in relation to renewable energy including offshore wind farms with an output above 100MW. Nationally designated landscapes are confirmed as having the highest status of protection and their statutory purposes should be taken into consideration.

2.2. Approach

The aim is to avoid significant adverse effects on high sensitivity seascape receptors. The premise is that the most important effect of offshore windfarms is on the perception of seascape character from the coast or related islands ie the relationship between any proposed development with coastal seascape character when seen in juxtaposition with each other. This means that the main drivers are distance from the coast and the character and value of the coastal seascape and its component sensitive receptors. Therefore different seascape zones were identified for this purpose alone and should not be used for other purposes which may need full seascape characterisation taking intrinsic natural and cultural processes and other characteristics into account.

The overall study focusses primarily on potential recommended buffers for National Parks and AONBs. However, other sensitive receptors are considered in this part of the study as they contribute to seascape character and perception. These include Heritage Coasts, World Heritage Sites and point features such as scheduled monuments e.g. coastal forts.

The seascape is divided into fifteen zones on the basis of:

- The extent of visual buffers relating to designated landscape areas - these inform the distances of the zones away from the coast.
- The presence or otherwise of existing windfarms, which affects seascape character

- The geometry of the Welsh coastline, taking account of major headlands, major bays and the character of the coast.

The zones are shown in Figure 1.

2.3. Sensitivity assessment

The sensitivity of a zone to offshore wind farms is based on a series of criteria which are consistent with the guidance prepared in Stage 2. The criteria group the factors into value, seascape susceptibility and visual susceptibility. A summary of the sensitivity of each zone is provided, in relation to offshore wind farm development, and includes recommendations to minimise their visual effects.

The thresholds for landscape and visual sensitivity are defined below. The five point scale reflects the subtlety of different seascape character.

Level	*Definition*
Low	Seascape and/or visual characteristics of the zone are robust or degraded and/or its values are low and it can accommodate the relevant type of development without significant character change or adverse effects. Thresholds for significant change are very high.
Medium/ low	Seascape and/or visual characteristics of the zone are resilient to change and/or its values are medium/low or low and it can accommodate the relevant type of development in many situations without significant character change or adverse effects. Thresholds for significant change are high.
Medium	Seascape and/or visual characteristics of the zone are moderately susceptible to change and/or its values are medium/low through to high/medium and/or it *may* have some potential to accommodate the relevant type of development in some *defined* situations without significant character change or adverse effects. Thresholds for significant change are intermediate.
High/ medium	Seascape and/or visual characteristics of the zone are susceptible to change and/or its values are medium through to high (although this level of value is is not essential where landscape or visual susceptibility are key issues). The seascape zone may be able accommodate the relevant type of development but only in limited situations without significant character change or adverse effects if defined in the relevant zone summary. Thresholds for significant change are low.
High	Seascape and/or visual characteristics of the zone are very susceptible to change and/or its values are high or high/medium and it is unable to accommodate the relevant type of development without significant character change or adverse effects. Thresholds for significant change are very low.

The seascape and visual sensitivity findings for each zone are summarised below and shown in Figures 7 and 8.

Summary of sensitivity

Area No:	Area name:	Sensitivity
1	North East Wales Inshore	Medium
2	North East Wales Offshore	Medium/low
3	North Wales and North Anglesey Inshore	High
4	North Wales and North Anglesey Offshore	Medium
5	North Wales and Anglesey Outer Offshore	Medium/low
6	Caernarfon Bay Inshore	High
7	Caernarfon Bay Offshore	High/medium
8	Cardigan Bay north Inshore	High
9	Cardigan Bay central inshore	High/medium
10	Cardigan Bay Offshore	High/medium
11	St George's Channel Offshore	Medium
12	Pembrokeshire coast Inshore and Carmarthen Bay	High
13	Pembrokeshire coast Offshore	High/medium
14	Celtic Sea	Medium/low
15	Bristol Channel and the Severn Estuary	High

2.4. General conclusions

Overall, the seascape of Wales is highly sensitive in many areas with a large proportion lying within the setting of national landscape designations and contributing to their special qualities. The zones are considered in groups of up to 22.6km, 22.6 – 44km and beyond 44km from the coast:

- **Up to 22.6km** from shore the sensitivity of seascape is generally considered to be high for wind farm development except for the north east coast (**Zone 1**) which already has existing wind farm development. Here, some small extension of windfarms may be possible but scope is limited.
- **Between 22.6km and 44km** from shore the potential location for wind energy is dependent on the height of turbine and the likely extent of the overall windfarm. In zone 4 well-designed development may be possible and in **Zone 2** development beyond Gwynt y Mor would be tend to limit harm. In some areas, such as off the Pembrokeshire and Llŷn Coasts, it is considered harmful to have development in these zones (**7, 10 and 13**) as development would be visible and would adversely affect the special qualities, including setting, tranquillity and apparent wildness of these remote western coasts.
- **Beyond 44km** from shore the effects of most sizes of wind turbines would be limited although they may be visible in certain light and weather conditions.

Development in **Zone 5** could be possible especially to the north east. Development in **Zone 11** may be possible although potential effects on Bardsey Island and the end of the Llŷn peninsula would need to be considered very carefully. Development in the majority of **Zone 14** would be likely to be possible although larger turbines in the areas closest to the Pembrokeshire coast and its islands may cause harm, again due to visibility in certain light and weather conditions.

PART 1

Overview, method and summary of findings

3. Introduction

3.1. Background and the brief

Natural Resources Wales (NRW) appointed White Consultants in November 2018 to undertake a strategic assessment and prepare guidance for seascape and visual sensitivity to offshore wind farms in Wales' marine plan area.

The brief states that the project aims are to:

- To undertake strategic assessment and mapping of areas of visual sensitivity to offshore windfarm development around the coast of Wales, which NRW can use to inform ongoing discussions with the Crown Estate and others, including Welsh Government and developers, about the leasing and consenting of any new areas for offshore wind.
- To prepare a short siting guidance paper in relation to seascape and visual effects of offshore wind farms aimed at an audience of developers, marine planners and NRW staff.

The project is in three parts, of which this report is the third. The parts are:

- A visual effects ready reckoner showing the recommended distances from National Parks and Areas of Outstanding Natural Beauty (AONBs) in relation to different turbine heights.
- A guidance note setting out what offshore windfarm developers need to know in relation to seascape and visual effects at their site search stage.
- A seascape sensitivity assessment for offshore windfarms in Wales' Marine plan area.

These parts are complementary to each other and should be considered together in order to inform the best location for future offshore wind farm locations, in terms of seascape and visual matters.

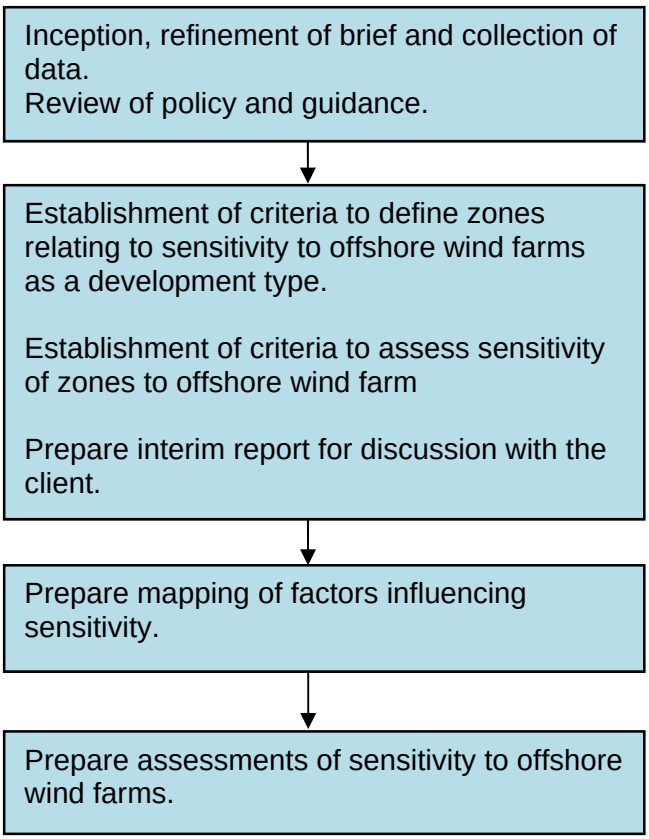
The brief sets out the following requirement for the seascape sensitivity study:

- An assessment which is spatially simple with the Welsh seascape divided into just a few well-reasoned broad areas, proportionate to the large scale of development anticipated.
- A desk based study relying on existing mapped areas such as National Parks and AONBs, seascape character areas, existing visual mapping work including the ready reckoner research (Stage 1 of the study).
- Appropriate methodology and criteria with reference to established landscape and seascape sensitivity good practice.
- Production of a technical report and GIS mapping.

4. Study approach and process

4.1. Process

The study process is summarised below:



4.2. Focus and limitations of the report

The brief requires a sensitivity study to offshore wind farm developments for different heights of turbines up to 350m high. The aim is to avoid significant adverse effects on high sensitivity seascape receptors. The premise that the study works on is that the most important effect of offshore windfarms is on the perception of seascape character from the coast or related islands ie the relationship between any proposed development with coastal seascape character when seen in juxtaposition with each other. This means that the main drivers are distance from the coast and the character and value of the coastal seascape and its component sensitive receptors. Therefore the areas or zones identified are focussed on this purpose alone and should not be used for other purposes which may need full seascape characterisation taking intrinsic natural and cultural processes and other characteristics into account.

Policy has been discussed in the Stage 1 and Stage 2 reports and so will not be repeated in full here. The main drivers are National Policy Statements EN-1 and EN-3. These address national infrastructure planning in relation to renewable energy including offshore wind farms with an output above 100MW. Nationally designated landscapes are confirmed as having the highest status of protection and their statutory purposes should be taken into consideration.

The overall study focusses primarily on potential recommended buffers for National Parks and AONBs. However, other sensitive receptors are considered in this part of the study as they contribute to seascape character and perception. These include Heritage Coasts, World Heritage Sites and point features such as scheduled monuments e.g. coastal forts.

This report has to be read with the Stage 1 and 2 of the study reports as well as good practice guidance in order to optimally locate and design development.

4.3. Relevant Guidance

The most relevant guidelines and reports taken into consideration in this study are as follows:

- Guidance on the Assessment of the Impact of Offshore Windfarms: seascape and visual impact report, DTI, 2005.
- Guidelines for Landscape and Visual Impact Assessment, Edition 3, (GLVIA 3) LI and IEMA, 2013.
- NECR 105 (Natural England)- broad brush guidance on seascape character assessment.
- UK Offshore Energy Strategic Environmental Assessment 2, DECC, March 2011.
- UK Offshore Energy Strategic Environmental Assessment 3, DECC, March 2016.
- Topic Paper 6 (Countryside Agency, 2002)- now dated and soon to be superceded document concerning strategic landscape sensitivity and capacity
- Welsh Seascapes and their sensitivity to offshore developments (Countryside Council for Wales, 2009)
- Landscape Sensitivity and Capacity Assessment: Guidance for Wales and associated Annex 1, Draft for consultation, (Natural Resources Wales, May and August 2018).

Welsh Seascapes and their sensitivity to offshore developments (2009) has been referred to as it specifically considers offshore wind farms. Whilst dated in terms of seascape character assessment methodology and the size of development assessed, many of the criteria used to assess sensitivity and the underpinning data are still relevant.

Landscape Sensitivity and Capacity Assessment (LSCA): Guidance for Wales addresses onshore wind and solar renewable energy development. This is draft guidance at the time of writing this report. The first part of the process is a sensitivity assessment which is reflected in this study.

- Identify and describe the type and scale of development
- Identify and describe the landscape resource
- Assess susceptibility, landscape value and sensitivity

The second element of the draft LSCA guidance concerning capacity is derived from the particular circumstances pertaining to the development of renewable energy on land in Wales including the development of Technical Advice Note (TAN) 8 Strategic Search Areas. This considers cumulative effects where there is substantial existing

development, thresholds for acceptable change, the proposed policy direction for landscape change, and, based on these factors, capacity. The expected level of detail for studies is at local landscape character area level. This seascape sensitivity study is at a broad brush national level considering areas which do not all benefit from existing character assessments (ie the offshore marine area), where visual buffers from designated areas are of particular importance, and where the existing level of development is much more limited. Therefore, the approach to assessing the ability of the seascape to accommodate a type and scale of change has been modified to be fit for purpose.

4.4. Definitions

Seascape susceptibility is the ability of seascape and visual resources to accommodate a particular type of change whilst still maintaining seascape or coastal character.

Seascape value is the nature and degree of importance that society attaches to a particular seascape or intervisible coast and landscape.

Seascape sensitivity combines the susceptibility of the seascape and visual resources and the values attached to those receptors.

4.5. Type and scale of development

The type and scale of offshore wind farm development has been defined in part by the Stage 1 study of around 23 seascape and visual impact assessments (SVIAs). This divides turbines into bands of heights each of which has different likely magnitudes of visual effects. This report assumes that offshore wind farms are likely to be at a larger scale than has been seen previously. This tends to mean, based on the experience of Rounds 1 to 3, that the further offshore, the larger the development is likely to be in terms of turbine size and numbers, unless it is an extension of an existing development eg Burbo Bank. This study assumes that the scale of development is a between 20 and 300 turbines in the following turbine height to blade tip bands:

- 107-145m
- 146-175m
- 176-225m
- 226-300m
- 301-350m

It is acknowledged that this covers a wide range of scales but reflects the types of development that have come forward or are likely to be considered in Round 4.

It is assumed that there will be associated offshore and coastal ancillary development to enable transmission of electricity to shore but the implications of transmission inland has not been taken into account. The main driver of effects is assumed to be the turbines themselves and their associated lighting although it is acknowledged that other infrastructure such as offshore substations contribute to effects.

4.6. The seascape resource

NECR 105 sets out in broad brush terms how to carry out a seascape character assessment. This states characterisation concentrates on making clear what makes one area different or distinctive from another. It also states that it is based on the integration of natural and cultural information combined with aesthetic and perceptual experiential aspects. This has already been carried out for the inshore area upto the territorial limits in the national marine character assessment, identifying 29 MCAs. However, the offshore component of the Welsh Marine Plan area has not been characterised.

The brief requires a desk study assessment of seascape sensitivity to windfarm development for both inshore and offshore areas which is spatially simple. The reason for this is to appropriately reflect the large scale of development and large spread of visual effects of very tall structures in an open seascape. This means that it is not a full character assessment in terms of NECR 105. Instead it is focussed on the factors which are most important in defining the relative seascape and visual sensitivity of an area to offshore wind farms. As such, the areas are defined as zones to avoid any implication that they are characterised as seascape character areas taking in the full range of factors which define such areas eg bathymetry, seabed geology and waviness. The grain of the assessment groups together existing MCAs and divides up the offshore areas.

The information used to define zones and inform sensitivity includes:

- Draft Welsh National Marine Plan areas and territorial limit
- Bathymetry and elevation
- Wales National Seascape Assessment- defining 29 Marine character areas in the Inshore Marine plan area.
- Local seascape character assessments for Anglesey, Snowdonia, Pembrokeshire Coast, Carmarthen Bay, Gower and Swansea Bay.
- Landscape designations and heritage constraints
- National Park and AONB management plans and related planning policies- with a particular emphasis on the special qualities
- LANDMAP visual and sensory- defining areas of outstanding or high value intervisible with the sea
- Biodiversity designations eg SPAs, SACs
- Onshore access eg Wales Coast Path, CROW access land
- Existing intervisibility analysis – defining land with sea views and sea visibility from land (part of the national seascape assessment above)
- Crown Estate existing round zones and potential Round 4 regions
- Existing marine uses and structures- existing windfarms, oil and gas platforms, MOD use etc
- Admiralty chart
- Patterns of maritime use- commercial and military use, shipping lanes
- Stage I seascape sensitivity report – identifying visual buffers for offshore windfarms related to National Parks and AONBs
- Stage 2 guidance note setting out what offshore windfarm developers need to know in relation to seascape and visual effects.

- Welsh seascapes and their sensitivity to offshore developments- defines 50 stretches of coast exploring their relationship with seascape and potential offshore renewable energy.

4.7. Defining seascape zones

Based on the analysis of the above we have divided the inshore and offshore areas into fifteen zones. The defining factors contributing to the sub-division are:

- The extent of visual buffers relating to designated landscape areas - these inform the distances of the zones away from the coast.
- The presence or otherwise of existing windfarms, which affects seascape character
- The geometry of the Welsh coastline, taking account of major headlands, major bays and the character of the coast.

The zones are shown in Figures 1-8 overlaying the various factors either define the zones or influence their sensitivity.

4.8. Criteria and Thresholds

The sensitivity of a zone to offshore wind farms is based on a series of criteria which are consistent with the guidance prepared in Stage 2. The criteria group the factors into value, seascape susceptibility and visual susceptibility. For each zone we summarise its sensitivity to offshore wind farm development and provide recommendations to minimise their visual effects.

The thresholds for landscape and visual sensitivity are defined below in Table 1. The five point scale reflects the subtlety of different seascape's character.

Table 1 Thresholds for landscape and visual sensitivity

Level	*Definition*
Low	Seascape and/or visual characteristics of the zone are robust or degraded and/or its values are low and it can accommodate the relevant type of development without significant character change or adverse effects. Thresholds for significant change are very high.
Medium/ low	Seascape and/or visual characteristics of the zone are resilient to change and/or its values are medium/low or low and it can accommodate the relevant type of development in many situations without significant character change or adverse effects. Thresholds for significant change are high.
Medium	Seascape and/or visual characteristics of the zone are susceptible to change and/or its values are medium/low through to high/medium and/or it *may* have some potential to accommodate the relevant type of development in some *defined* situations without significant character change or adverse effects. Thresholds for significant change are intermediate.
High/ medium	Seascape and/or visual characteristics of the zone are vulnerable to change and/or its values are medium through to high (although this level of value is not essential where landscape or visual susceptibility are key issues). The seascape zone may be able accommodate the relevant type of development but only in limited situations without significant character change or adverse effects if defined in the relevant zone summary. Thresholds for significant change are low.
High	Seascape and/or visual characteristics of the zone are very susceptible to change and/or its values are high or high/medium and it is unable to accommodate the relevant type of development without significant character change or adverse effects. Thresholds for significant change are very low.

It is important to note that, even within smaller zones, there may be variations in sensitivity. For instance, a zone which is stated as medium sensitivity is likely to have some opportunity for development within it but not necessarily all. Therefore the sensitivity and therefore the resulting capacity do not necessarily apply to the whole area. We define the extent, size and location in the recommendations and associated summary text. It should be noted that other land within the zone is considered to be an area of constraint in terms of seascape and visual factors. For high/medium sensitivity zones there may be sea which has high sensitivity with other parts which may have some very minor capacity but this does not amount to potential for a strategic allocation. Overall, this level of sensitivity is considered to be a constraint on large wind farms in terms of seascape and visual factors.

The sensitivity relates to the effects on Welsh and adjoining relevant English coastlines and landscape designations. It does not take into account the potential effects on the Isle of Man.

5. Summary of seascape and visual sensitivity and capacity findings

The seascape and visual sensitivity findings indicate the preferred location of offshore wind farms with a tabular summary of sensitivities for each zone below. A detailed assessment for each zone is set out in Part 2 which sets out the recommendations for different heights of wind turbines. All these conclusions clearly only relate to seascape and visual matters and not other factors which have to be taken into consideration, particularly in relation to the intrinsic nature of the sea and sea bed.

The following conclusions summarised in Table 2 have been reached on the locations that development might proceed in terms of seascape and visual sensitivity factors. They are based entirely on the zone evaluations and if there is any perceived conflict or difference in emphasis between the two, the detailed evaluations should be taken as the definitive position.

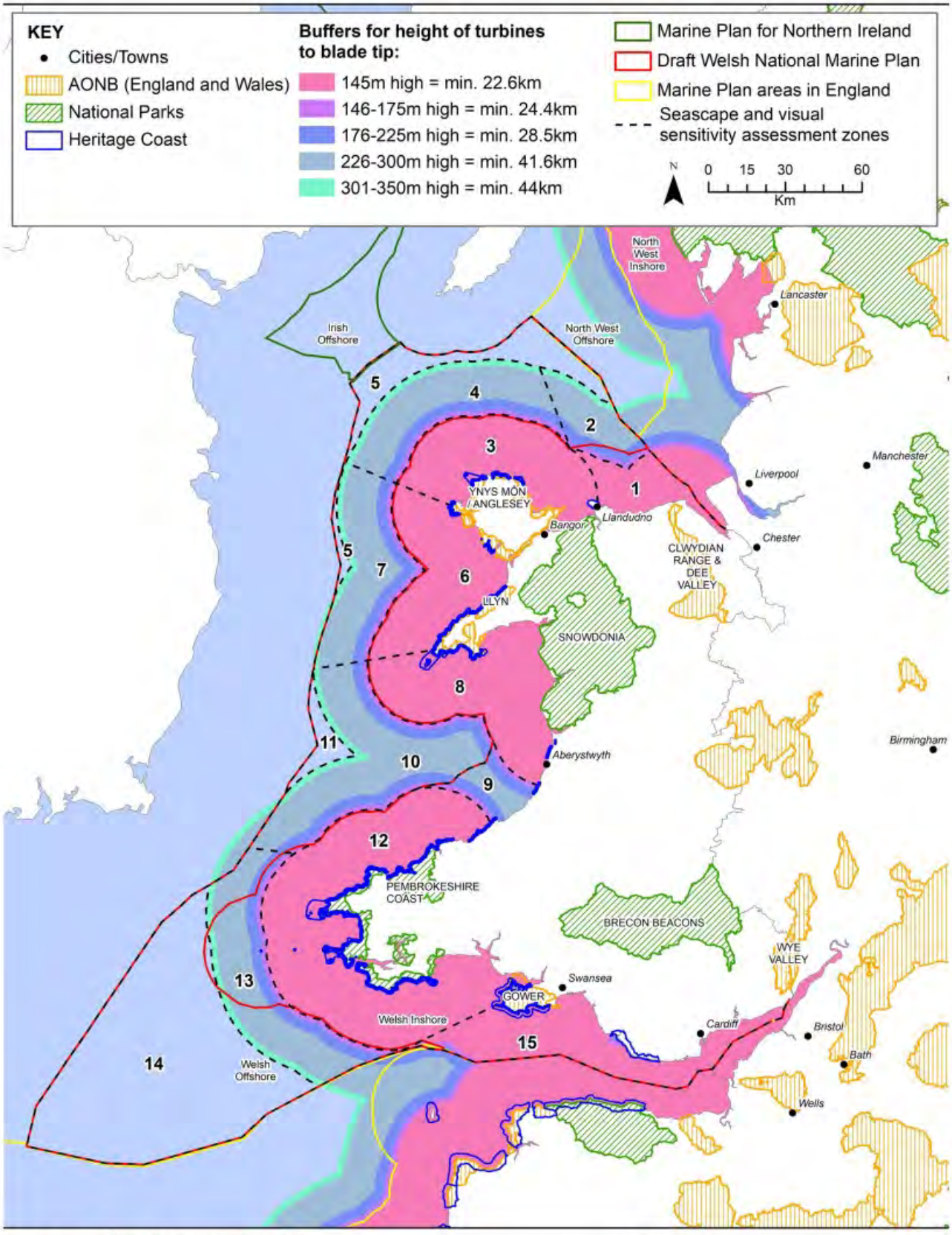
Table 2 Summary of sensitivity

Area No:	Area name:	Sensitivity
1	North East Wales Inshore	Medium
2	North East Wales Offshore	Medium/low
3	North Wales and North Anglesey Inshore	High
4	North Wales and North Anglesey Offshore	Medium
5	North Wales and Anglesey Outer Offshore	Medium/low
6	Caernarfon Bay Inshore	High
7	Caernarfon Bay Offshore	High/medium
8	Cardigan Bay north Inshore	High
9	Cardigan Bay central inshore	High/medium
10	Cardigan Bay Offshore	High/medium
11	St George's Channel Offshore	Medium
12	Pembrokeshire coast Inshore and Carmarthen Bay	High
13	Pembrokeshire coast Offshore	High/medium
14	Celtic Sea	Medium/low
15	Bristol Channel and the Severn Estuary	High

Overall, the seascape of Wales is highly sensitive in many areas with a large proportion lying within the setting of national landscape designations and contributing to their special qualities. The zones are considered in groups of up to 22.6km, 22.6 – 44km and beyond 44km from the coast:

- **Up to 22.6km** from shore the sensitivity of seascape is generally considered to be high for wind farm development except for the north east coast (**Zone 1**) which already has existing wind farm development. Here, some small extension of windfarms may be possible but scope is limited.
- **Between 22.6km and 44km** from shore the potential location for wind energy is dependent on the height of turbine and the likely extent of the overall windfarm. In zone 4 well-designed development may be possible and in **Zone 2** development beyond Gwynt y Mor would be tend to limit harm. In some areas, such as off the Pembrokeshire and Llŷn Coasts, it is considered harmful to have development in these zones (**7, 10 and 13**) as development would be visible and would adversely affect the special qualities, including setting, tranquillity and apparent wildness of these remote western coasts.
- **Beyond 44km** from shore the effects of most sizes of wind turbines would be limited although they may be visible in certain light and weather conditions. Development in **Zone 5** could be possible especially to the north east. Development in **Zone 11** may be possible although potential effects on Bardsey Island and the end of the Llŷn peninsula would need to be considered very carefully. Development in the majority of **Zone 14** would be likely to be possible although larger turbines in the areas closest to the Pembrokeshire coast and its islands may cause harm, again due to visibility in certain light and weather conditions.

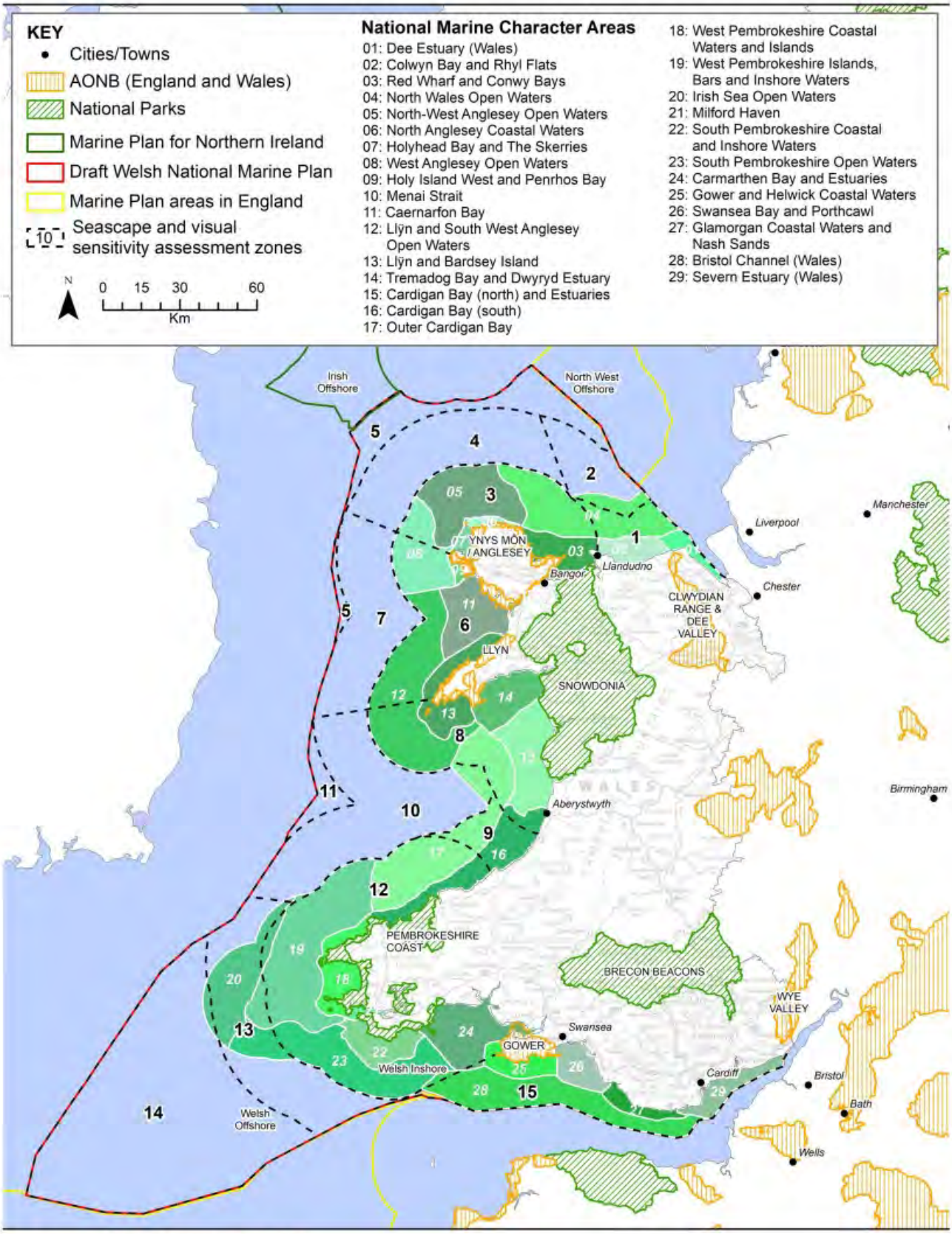
FIGURES



www.whiteconsultants.co.uk

07/03/19 | v5 | Drawn: HK | Checked SW

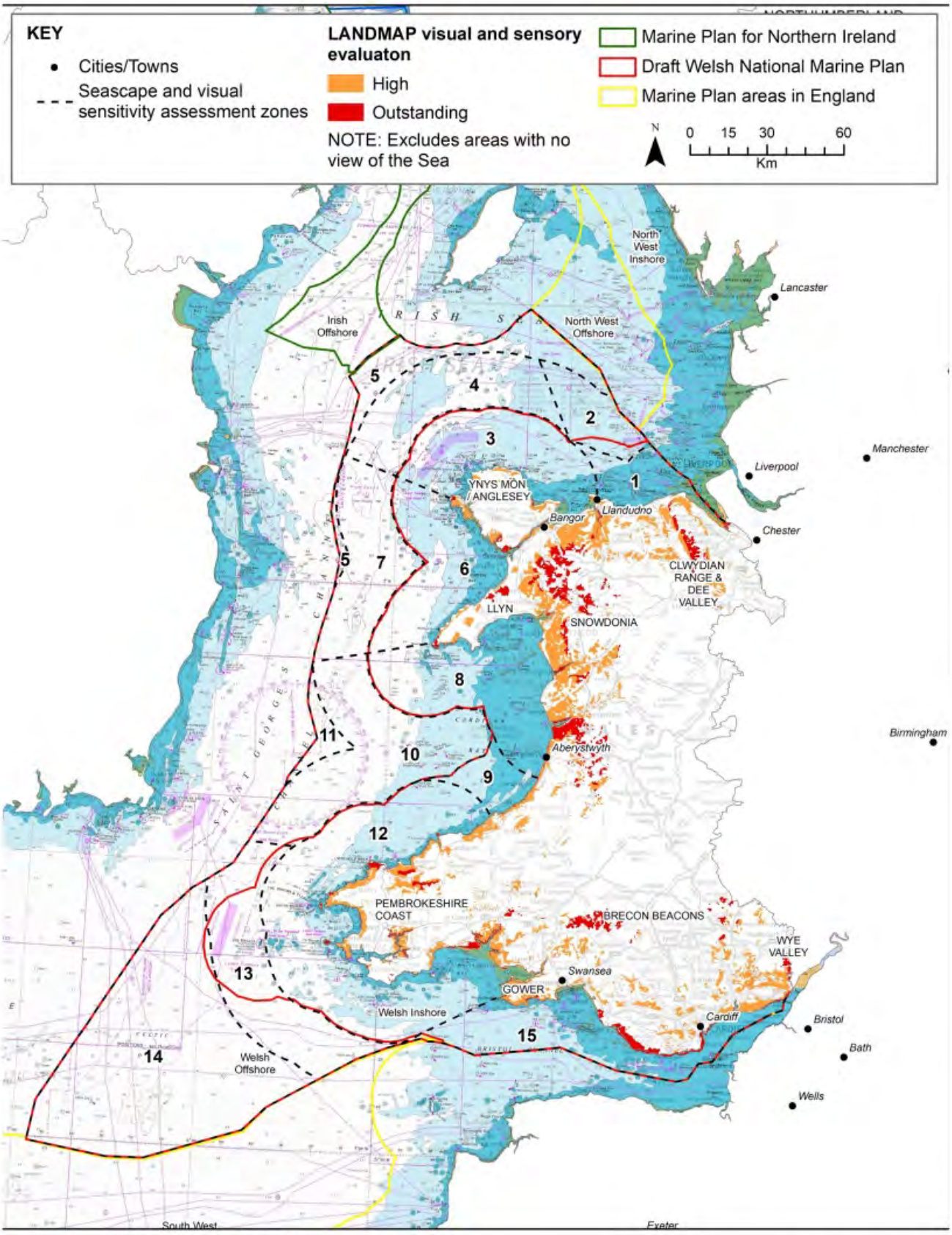
Figure 1
Designated Landscape buffers - for low magnitude of visual effect for different wind turbine heights



www.whiteconsultants.co.uk

Figure 2
National Marine Character Areas

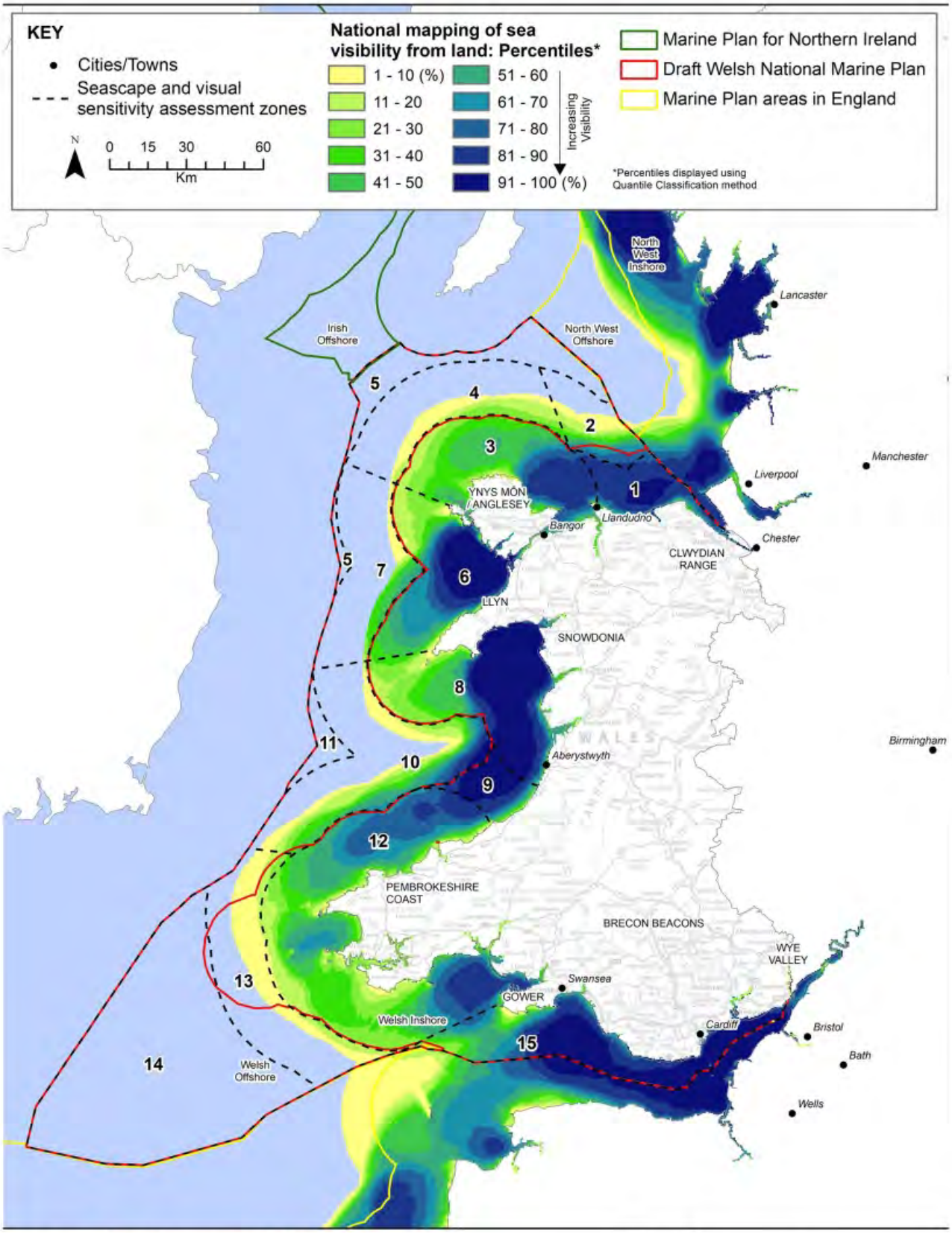
08/03/19 | v3 | Drawn: HK | Checked SW



www.whiteconsultants.co.uk

08/01/19 | v3 | Drawn: HK | Checked SW

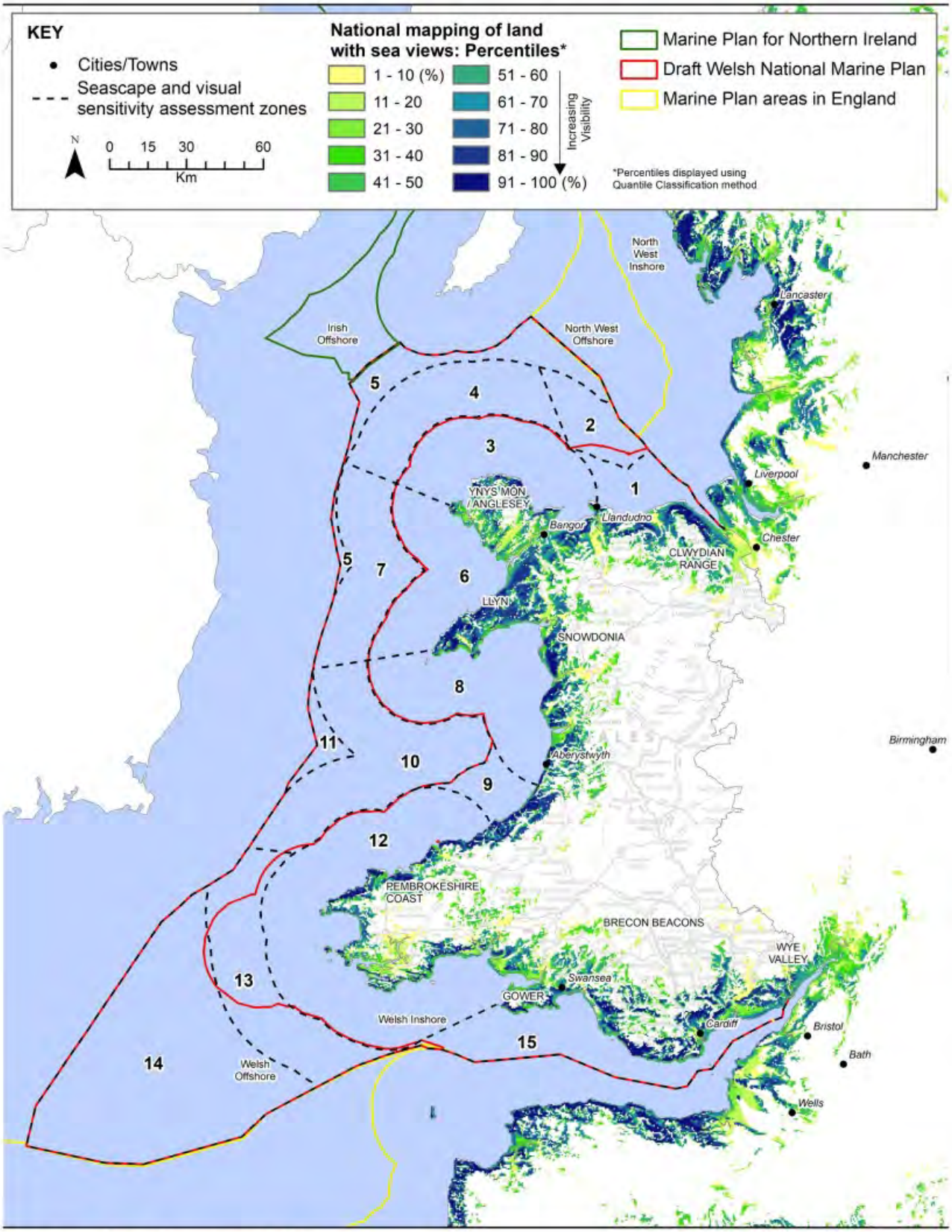
Figure 3
LANDMAP visual and sensory aspect - high or outstanding evaluation areas with sea views



www.whiteconsultants.co.uk

Figure 4
Relative visibility of sea surface from land

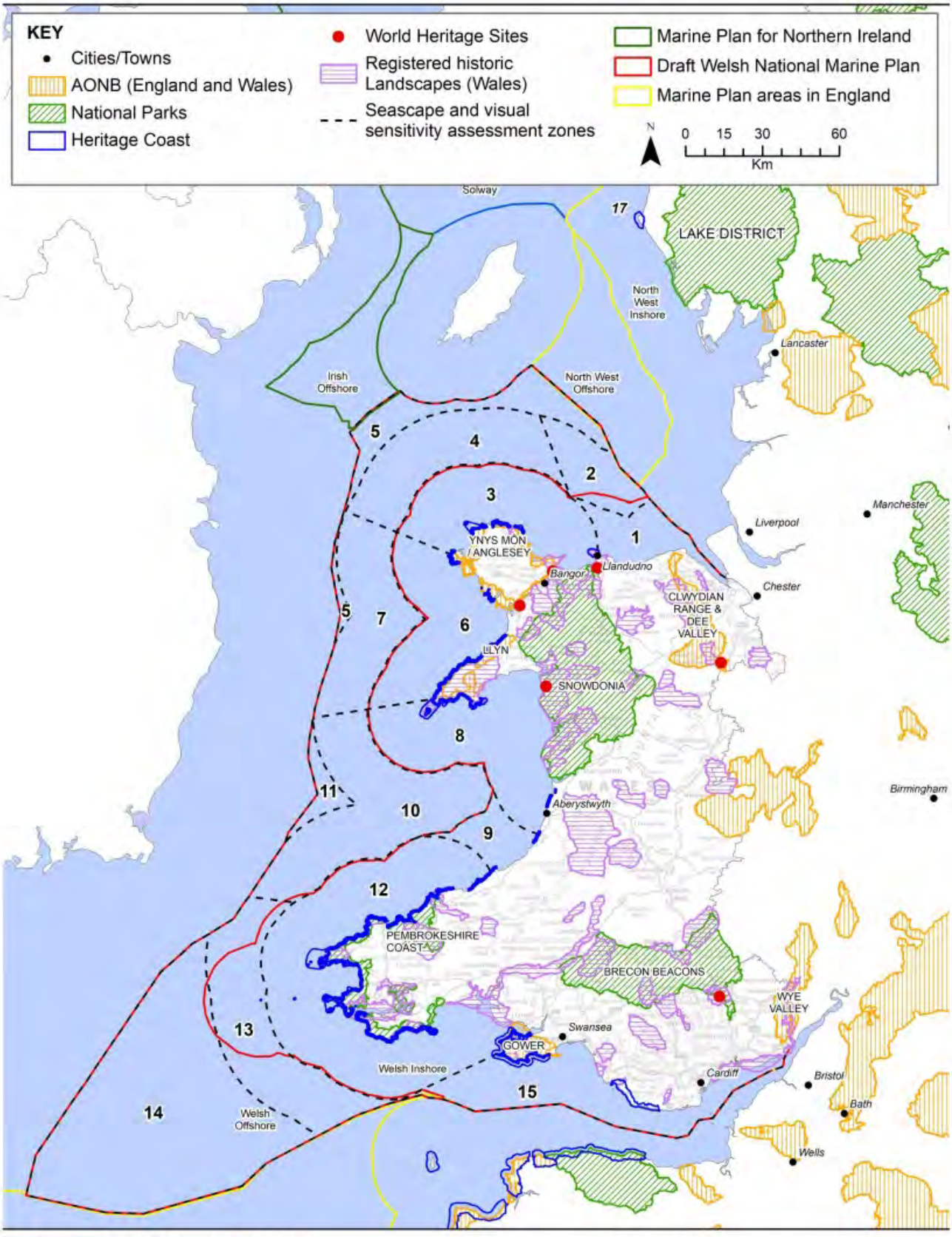
08/03/19 | v2 | Drawn: HK | Checked SW



www.whiteconsultants.co.uk

Figure 5
Relative visibility of land with sea views

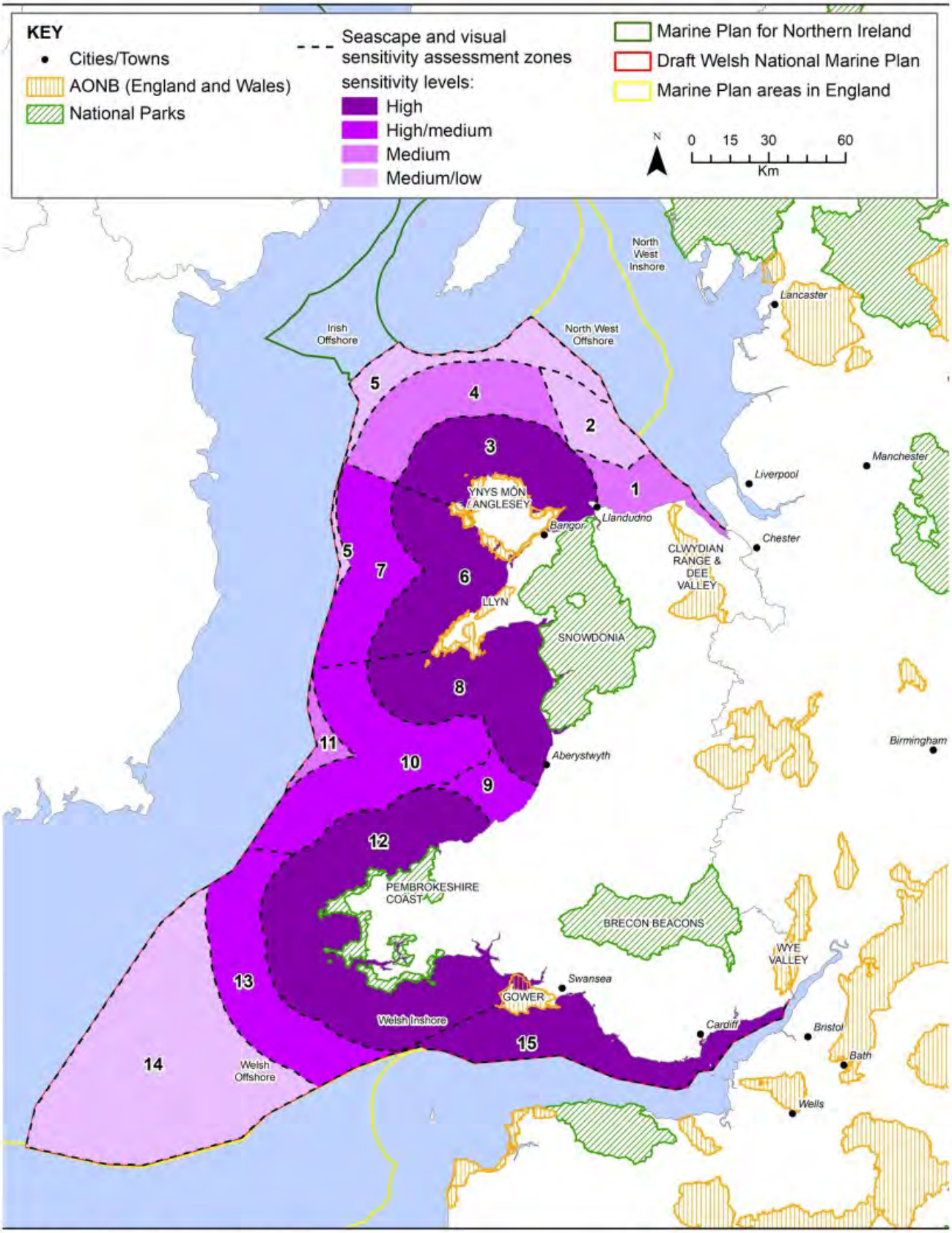
08/03/19 | v3 | Drawn: HK | Checked SW



white CONSULTANTS www.whiteconsultants.co.uk

Figure 6
Landscape and Heritage Designations and Registrations

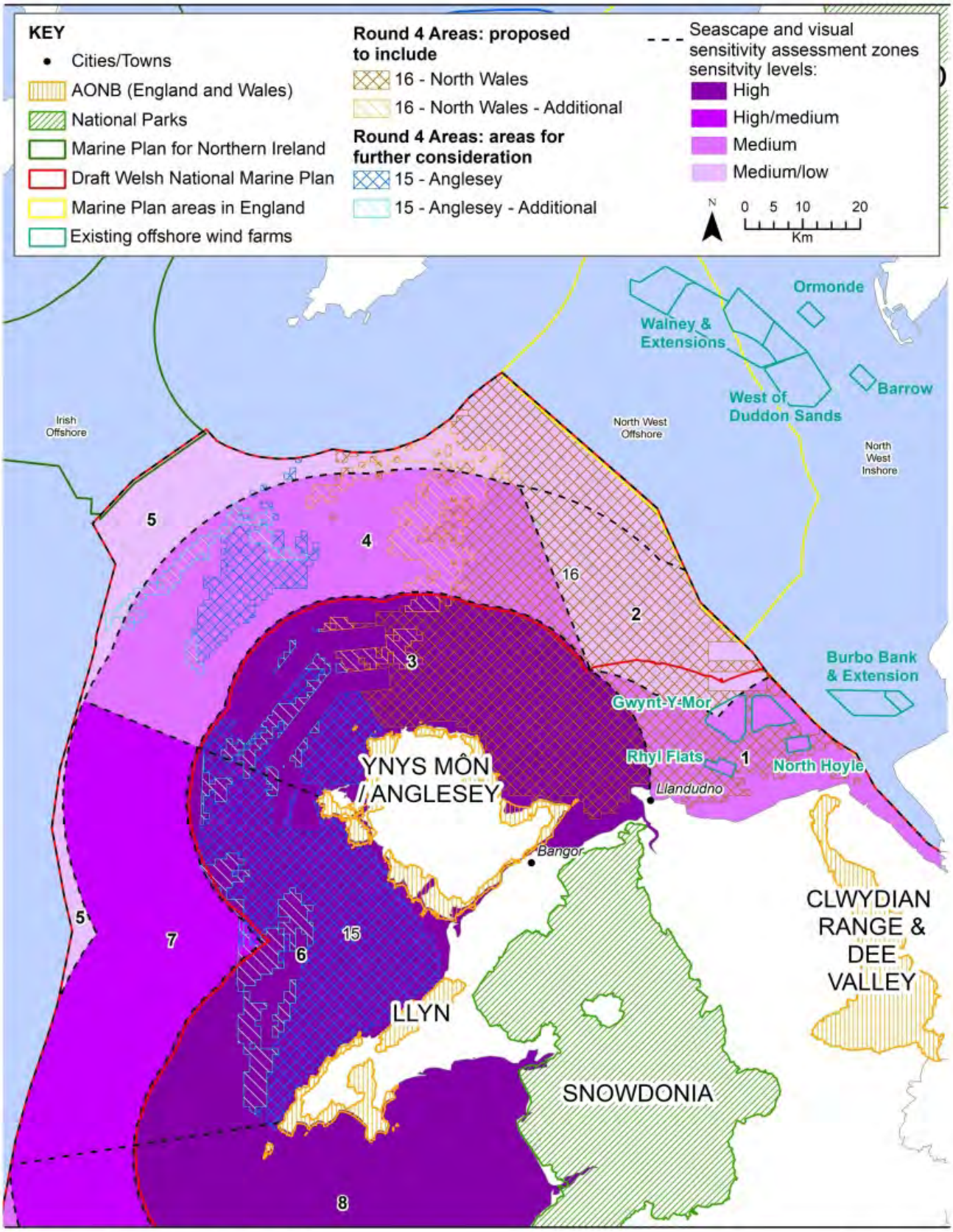
08/03/19 | v3 | Drawn: HK | Checked SW



www.whiteconsultants.co.uk

Figure 7
Designated landscapes, their seascape settings and their sensitivity to offshore wind farms

28/03/19 | v2 | Drawn: HK | Checked SW



www.whiteconsultants.co.uk

28/03/19 | v2 | Drawn: HK | Checked SW

Figure 8
Designated landscapes, their seascape settings and their sensitivity to offshore windfarms - off North Wales

PART 2
Detailed sensitivity and capacity assessments

Zone No: 1	Name: North East Wales Inshore
Location	
The area is located off the north coast of Wales from the Great Orme east to the Dee estuary.	
OVERALL SENSITIVITY	
Sensitivity	Medium
Summary	
To the east is large scale open, relatively straight coastline with a large proportion of urban settlement, the tourism is focussed on beach holidays. There are already a windfarm and gas developments offshore which act as lit vertical foci with related boats. To the west the settled coast becomes embayed with headlands and more formal promenades terminating in the distinctive landform of Great Orme. The area's susceptibility lies particularly in the elevated views from Conwy Mountain and the Carneddau to the south west and from the Great Orme Country Park. There is also susceptibility in views from the northern tip of the Clwydian Range and from the framed views from Llandudno and from Colwyn Bay including the promenades. The area's value lies in its proximity to the Snowdonia National Park to the south west and the Great Orme Heritage coast as well as views from Conservation areas (e.g. Llandudno) and listed buildings along the coast. There is potential for combined cumulative effects on the Great Orme and Snowdonia if further windfarms or extensions extend west, especially closer to shore.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
The zone would be sensitive to further development. Extending Gwynt y Mor west would cause cumulative effects on sensitive receptors mentioned above. Repowering existing developments with larger turbines would further increase their already significant effects in the inshore parts of this area, heightened by the Burbo Bank extension to the east. A small number of additional turbines of the same size and design attached to the existing developments may be possible, but cumulative effects and avoiding extending across the horizon from key viewpoints would need to be carefully considered.	
VALUE- DESIGNATIONS	

Landscape designations	*Designation*	**Clwydian Range and Dee Valley AONB**
	Relevant special qualities	Landscape character and quality- Tranquillity, remoteness and wildness, space and freedom. Access, recreation and tourism- Offa's Dyke National Trail.
	Notes	Primarily a landscape-related designation. A long narrow designated range of hills with the northern tip overlooking the sea to the north (and the eastern edge

		with views over the Dee estuary).
	Designation	**Snowdonia National Park**
	Relevant special qualities	Diversity of high quality landscapes and coastal areas– ranging from coast rolling uplands to the rugged mountains. Areas of tranquillity and solitude.
	Notes	The mountains contribute to the coastal character providing a strong backcloth. The coastal slopes and peaks allow views out to sea from elevated locations.
	Designation	**Great Orme Heritage Coast**
	Relevant special qualities	Limestone cliffs and grasslands 'among the nation's finest coastal scenery'.
	Notes	The Great Orme is a coastal peninsula allowing commanding elevated views of most of Wales north coast and seas as well as south to Snowdonia. It is highly distinctive and popular to visitors, also used as a Country Park.
Historic designations	*Registered historic landscapes*	Creuddyn and Conwy
	Historic parks and gardens	Kinmel Park; Gwrych Castle The Flagstaff, Colwyn Bay Happy Valley, Llandudno Haulfre Gardens, Llandudno
	Key scheduled monuments	Moel Hiraddug Hillfort SJ 0678 Rhuddlan Castle (also Guardianship site) SJ 0277 Pen y Corddyn Hillfort SH 9176 Bryneuryn Hillfort SH 8379
Nature conservation designations	*SPA*	Liverpool Bay
	SAC	Menai Strait and Conwy Bay
	Ramsar	-
LANDMAP visual and sensory value in areas with sea views		Clwydian Range- outstanding Great Orme- high
SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	Large – open nature of coast
	Openness and enclosure	Generally open, with enclosure by hills to the west.
	Coastal aspect	North facing
	Coastal and hinterland form	A north facing low lying linear coast backed by a coastal plain to the east with a constricted embayed

		coastline to the west at Colwyn Bay and Llandudno with steep sided hills reaching the coast, terminating in the distinctive landform of Great Orme.
Existing development	*Coastal settlement/ development pattern and foci*	To the east, the coast is a highly developed for tourism uses including towns and large-scale caravan parks, with dunes to the east. To the west the coast is built up with a series of coastal resorts between the hills and the shore with some minor gaps including headlands such as Little Orme.
	Marine development and use	Substantial existing development of wind farms at Gwynt y Mor, Rhyl Flats and North Hoyle. The Douglas oil and gas complex lies just to the north. Large commercial vessels use the area bound for the Mersey. There is commercial and recreational fishing.
Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	Limited by wind farms and coastal development
	Dark skies/ Lighting	Both the coast and the windfarms are lit with some areas of intervening darkness
Exposure		Exposed
Cultural associations	*Cultural associations*	Great Orme's Head - Viking associations; Victorian Holiday resorts: Llandudno 'Queen' of North Wales Resorts, including Marine Parade, Marine Drive and pier; Colwyn Bay, Rhyl.
VISUAL SUSCEPTIBILITY		
Distance offshore- range		Shore to 22.6km
*Size of turbines potentially having low magnitude of effect**		• All turbine sizes would be likely to exceed low magnitude of effect. • However, existing windfarms may modify the likely impacts.
*Size of turbines potentially having medium magnitude of effect**		• Turbines below 145m would be likely to exceed medium magnitude of effect less than14km from shore. • Turbines 145-175m would be likely to exceed medium magnitude of effect less than18.8km from shore. • Turbines above 175m would be likely to exceed medium magnitude of effect. • However, existing windfarms may modify the likely impacts.
Visual experience	*Seascape Pattern and Foci*	Offshore wind farms at Gwynt y Mor, Rhyl Flats and North Hoyle form the dominant/prominent elements with Douglas oil and gas complex beyond offshore visible in some conditions. Burbo Bank extension is

		visible to the east. Movement of boats to service the windfarms is noticeable with commercial shipping to and from Liverpool and to Llandulas apparent occasionally.
	Contribution to the setting of a coast or seascape character area	Sea viewed from coastal resorts in open seascape to east as setting to wide beaches and framed between headlands to the west, especially from Llandudno. Gwynt y Mor almost fills the extent of the view here. The red aircraft warning lights are visible at night.
	How seascape is experienced	Primarily from promenades, beaches, Coast Path and cycle route, railway and some roads/corniches. Most views in a built context although with some gaps where there are dunes and other natural features.
Key visual receptors	*In nationally designated landscapes*	Offa's Dyke National Trail in Clwydian Hills AONB Conwy Mountain
	Outside nationally designated landscapes	Great Orme Country Park Wales Coast Path Promenades especially at Llandudno Conservation Areas
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		01: Dee estuary , 02: Colwyn Bay and Rhyl Flats
Local seascape character areas		No local study

Zone No: 2	Name: North East Wales Offshore
Location	
The area is located offshore from the north coast of Wales from the Great Orme east to the Dee estuary.	
OVERALL SENSITIVITY	
Sensitivity	Medium/Low
Summary	
The zone lies in open sea with the northern edge of Gwynt y Mor windfarm located on its southern margins and the Douglas oil and gas complex nearby. Beyond this to the south are further wind farms and the north east Wales coast which has large scale open, relatively straight coastline to the east and embayed coastline with headlands and the distinctive landform of Great Orme to the west. The coast has a high proportion of urban settlement focussed on residential and tourism, with caravan and beach holidays to the east and Victorian resorts with associated promenades mainly to the west. The area's susceptibility lies particularly in the elevated views from Conwy Mountain and the Carneddau to the south west and from the Great Orme Country Park. There is also susceptibility from the northern tip of the Clwydian Range and from the framed views from Llandudno and from Colwyn Bay including the promenades. The area's value lies in its location offshore from the Snowdonia National Park to the south west and the Great Orme Heritage coast as well as views from Conservation areas (e.g. Llandudno) and listed buildings along the coast.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
There is potential for combined cumulative effects on the Great Orme and Snowdonia if further windfarms or extensions extend west, especially closer to shore. The area has ability for further development to be accommodated to the north of Gwynt y Mor (but away from Douglas Oil field). The size of turbine should be similar to the existing development closer to shore but can increase in height further offshore taking into account the visual impact analysis.	
VALUE- DESIGNATIONS	
Landscape designations	*Designation*	**Clwydian Range and Dee Valley AONB**
	Relevant special qualities	Landscape character and quality- tranquillity, remoteness and wildness, space and freedom. Access, recreation and tourism- Offa's Dyke National Trail.
	Notes	Primarily a landscape-related designation. A long narrow designated range of hills with the northern tip overlooking the sea to the north (and the eastern edge with views over the Dee estuary).

	Designation	**Snowdonia National Park**
	Relevant special qualities	Diversity of high quality landscapes and coastal areas– ranging from coast rolling uplands to the rugged mountains. Areas of tranquillity and solitude.
	Notes	The mountains contribute to the coastal character providing a strong backcloth. The coastal slopes and peaks allow views out to sea from elevated locations.
	Designation	**Great Orme Heritage Coast**
	Relevant special qualities	Limestone cliffs and grasslands 'among the nation's finest coastal scenery'.
	Notes	The Great Orme is a coastal peninsula allowing commanding elevated views of most of Wales north coast and seas as well as south to Snowdonia. It is highly distinctive and popular to visitors, also used as a Country Park.
Historic designations	*Registered historic landscapes*	Creuddyn and Conwy
	Historic parks and gardens	Kinmel Park; Gwrych Castle The Flagstaff, Colwyn Bay Happy Valley, Llandudno Haulfre Gardens, Llandudno
	Key scheduled monuments	Moel Hiraddug Hillfort SJ 0678 Rhuddlan Castle (also Guardianship site) SJ 0277 Pen y Corddyn Hillfort SH 9176 Bryneuryn Hillfort SH 8379
Nature conservation designations	*SPA*	Liverpool Bay
	SAC	Menai Strait and Conwy Bay
	Ramsar	-
LANDMAP visual and sensory value in areas with sea views		Clwydian Range- outstanding Great Orme- high
SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	Very large
	Openness and enclosure	Open
	Coastal aspect	North facing
	Coastal and hinterland form	A north facing low lying linear coast backed by a coastal plain to the east with a constricted embayed coastline to the west at Colwyn Bay and Llandudno with steep sided hills reaching the coast, terminating in

		the distinctive landform of Great Orme.
Existing development	*Coastal settlement/ development pattern and foci*	To the east, the coast is a highly developed for residential and tourism uses including towns and large-scale caravan parks, with dunes to the east. To the west the coast is built up with a series of coastal resorts between the hills and the shore with some minor gaps including rocky headlands such as Little Orme.
	Marine development and use	Gwynt y Mor and Douglas oil and gas complex on the southern fringes. Other windfarms visible to the north east. Large commercial vessels use the area bound for the Mersey. There is commercial fishing.
Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	A wild area of sea modified by the Douglas oil and gas complex, wind farms and coastal development to the south
	Dark skies/ Lighting	The wind farms and Douglas oil and gas complex are lit, with the urban settlement of the coast to the south with large areas of intervening darkness
Exposure		Exposed
Cultural associations	*Cultural associations*	Great Orme's Head - Viking associations; Victorian Holiday resorts eg Llandudno 'Queen' of North Wales Resorts, including Marine Parade, Marine Drive and pier; Colwyn Bay; Rhyl.
VISUAL SUSCEPTIBILITY		
Distance offshore- range		22.6km to 44km from shore
*Size of turbines potentially having low magnitude of effect**		• Turbines below 145m would not be likely exceed low magnitude of effect. • Turbines 145-175m would not be likely to exceed low magnitude of effect beyond 24.4km from shore. • Turbines 175-225m would not be likely to exceed low magnitude of effect beyond 28.5km from shore. • Turbines 225-300m would not be likely to exceed low magnitude of effect beyond 41.6km from shore. • Turbines 300-350m would be likely to exceed low magnitude of effect. • However, existing windfarms may modify the likely impacts.
*Size of turbines potentially having medium magnitude of effect**		• Turbines below 145m would be likely to exceed medium magnitude of effect less than14km from shore.

		• Turbines 145-175m would be likely to exceed medium magnitude of effect less than18.8km from shore. • Turbines above 175m would be likely to exceed medium magnitude of effect. • However, existing windfarms may modify the likely impacts.
Visual experience	*Seascape Pattern and Foci*	Douglas oil and gas complex lies within the area, the offshore wind farm at Gwynt y Mor forms a prominent feature on the southern edge and other windfarms to the north east. Burbo Bank and extension are visible to the south east. Boats to service the oil and gas complex and windfarms are noticeable with commercial shipping to and from the Mersey.
	Contribution to the setting of a coast or seascape character area	Sea viewed from coastal resorts framed between headlands, especially from Llandudno. Gwynt y Mor almost fills the extent of the view here. The red and white warning lights are visible at night.
	How seascape is experienced	Primarily from promenades, beaches, Coast Path and cycle route, railway and some roads/corniches. Most views are in a built context although with some gaps where there are headlands and other natural features.
Key visual receptors	*In nationally designated landscapes*	Conwy Mountain
	Outside nationally designated landscapes	Great Orme Country Park Wales Coast Path Promenades especially at Llandudno Conservation Areas
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		04: North Wales Open Waters in southern edge Offshore from: 01: Dee Estuary 02: Colwyn Bay and Rhyl Flats
Local seascape character areas		No local study

Zone No: 3	Name: North Wales and North Anglesey Inshore
Location	
The zone is located inshore between Great Orme to the east and North Stack, Holyhead Mountain on Anglesey.	
OVERALL SENSITIVITY	
Sensitivity	High
Summary	
To the east the settled coast is backed by the mountains of Snowdonia (Carneddau) and framed by the high cliffs of Great Orme's Head to the east and Puffin Island and the coast of Anglesey to the west. Anglesey generally has a lower plateau topography with resultant low cliffs and slopes, apart from the distinctive form of Holyhead Mountain which terminates the area with high sea cliffs to the west. Anglesey's northern coast is rocky and convex meaning development out to sea would be largely unscaled whilst its north west and east coasts have a series of small embayments and coves with associated small settlements and holiday accommodation in places. Industrial features such as Wylffa have now become disused but structures may remain juxtaposed with onshore windfarms inland. The sea is open and exposed with commercial vessels running to and from the Mersey ports and ferries issuing from Holyhead's busy harbour. The area's susceptibility lies particularly in the elevated views from Conwy Mountain and the Carneddau from the south, from Great Orme Country Park to the east, and from the rural Anglesey coastal fringe with associated Coast Path. Views north from the mainland could be affected if wind farms are seen in conjunction with Beaumaris or Puffin Island. The area's value lies in its proximity to the Snowdonia National Park and Great Orme Heritage coast to the south east, and Anglesey AONB (and associated heritage coast) to the south and west as well as juxtaposition with the world heritage site at Beaumaris, and scheduled monuments along the coast. Particularly sensitive receptors on Anglesey include users of Penmon Point, Red Wharf Bay and Holyhead Mountain and the coast has some tranquillity and remoteness especially towards the north.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
There is potential for combined cumulative effects particularly on Great Orme Heritage Coast and Snowdonia if further windfarms or extensions extend west, especially closer to shore. The area has very limited ability to accommodate offshore windfarms due to the proximity of the Snowdonia National Park and Anglesey AONB as well as views from Great Orme north west.	
VALUE- DESIGNATIONS	
Landscape designations — *Designation*	**Anglesey AONB**
Relevant special qualities	Expansive views/seascapes Peace and tranquillity

		Islands around Anglesey
	Notes	The management plan does not expand on the special qualities but refers to the local seascape character assessment. Includes the Heritage Coast at Holy Island and the north coast.
	Designation	**Snowdonia National Park**
	Relevant special qualities	Diversity of high quality landscapes and coastal areas– ranging from coast rolling uplands to the rugged mountains. Areas of tranquillity and solitude.
	Notes	The mountains contribute to the coastal character providing a strong backcloth. Their steep coastal slopes and peaks allow views out to sea from highly elevated locations.
Historic designations	*Registered historic landscapes*	North Arllechog; Penmon; Creuddyn Amlwch and Parys Mountain
	Historic parks and gardens	Penrhyn Castle; Bryn y Neuadd, Cestyll- view [west of Wylfa]
	Key scheduled monuments	Deganwy Castle SH 7879 Castell Caer Seion Hillfort SH 7577 / 7677 Bwrdd Arthur Hillfort SH 5881 Dinas Gynfor Hillfort SH 3895 / 3995 Caer y Twr Hillfort SH 2182- on Holyhead Mountain (Beaumaris Castle (also Guardianship and WHS) SH 6076 (faces inland but may be seen in juxtaposition with offshore development) (Conwy Castle (also Guardianship and World Heritage Site) SH 7877 (faces across the estuary))
Nature conservation designations	*SPA*	Liverpool Bay
	SAC	Menai Strait and Conwy Bay
	Ramsar	-
LANDMAP visual and sensory value in areas with sea views		Outstanding value at Holyhead Mountain, in pockets on the north coast and at Red Wharf Bay and Puffin Island. High value at the Great Orme, Snowdonia (Carneddau) and the majority of the Anglesey Coast.
SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	The mountains of Snowdonia to the south are large-scale whilst the coast of Anglesey is generally medium-scale with the sea expanding to large-scale to the north.
	Openness and enclosure	Ranges from moderately enclosed in the south east between Great Orme and Puffin Island increasing in

		openness to Point Lynas, and then the west.
	Coastal aspect	Primarily north with components of the north-east and north-west
	Coastal and hinterland form	The distinctive whaleback rocky limestone headland of the Great Orme forms the eastern landmark and Snowdonia acts as the backcloth to the coastline either dramatically reaching the coast to the east or setting back behind gentle coastal slopes to the west. Anglesey has a rocky and fine-grained north east to north west facing coast with medium-sized sloping cliffs and small headlands and occasional beaches and coves between stretches of intertidal rocks. The northern coast is finer grained still with small coves and low rocky cliffs on a convex coast. The hinterland on the island is relatively low lying with the exception of Holyhead Mountain.
Existing development	*Coastal settlement/ development pattern and foci*	The mainland coast has linear settlement form such as Penmaenmawr and Llanfairfechan set on the A55 and mainline railway, with Bangor being the largest settlement, which also has a pier. On Anglesey, Beaumaris faces towards the mainland across the Menai Strait, whilst the north west Holyhead is a busy ferry port with a large harbour. Other coastal settlements on Anglesey are smaller and rural, eg Benllech and Moelfre, and have associated caravan parks. Wyllfa nuclear power station currently lies on the less settled north coast close to Amlwch.
	Marine development and use	Windfarms are visible to the east. Large commercial vessels use the area bound for the Mersey with ships waiting for pilots off Point Lynas. There is commercial fishing.
Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	The north coast of Anglesey is generally remote and rocky wild character and fairly tranquil only disturbed by Wylfa power station and the site of the former chemical works at Amlwch. This section is closest to the Isle of Man, which is visible at great distance in clear weather. The north east and north west coasts are moderately tranquil, reduced in summer by tourism, and by ferry traffic and other activity around Holyhead. Onshore wind farms and power lines modify the hinterland's tranquillity. The mainland coast is not tranquil to the east mainly due to the transport corridors but is more tranquil to the west away from the A55 and the mountains of Snowdonia to the south are highly tranquil with a wild character.

	Dark skies/ Lighting	The coast is mainly dark to the north with lighting associated with Holyhead, Bangor and other coastal settlements and with the A55. There are lighthouses at the Skerries and Point Lynas. Out to sea there is lighting associated with the windfarms some distance to the east.
Exposure		The northern and north eastern shores of Anglesey are most exposed.
Heritage features		The main foci of interest are the registered historic landscapes and their associated features- Creuddyn including the Great Orme, North Arllechog, Penmon, Amlwch and Parys Mountain.
Cultural associations	*Cultural associations*	Penmon Priory; Priestholm or Puffin Island - monastic settlement; Moelfre and the shipwreck of the Royal Charter; Bwrdd Arthur, Llanddona, an important hill top archaeological site; Holyhead - packet port and crossing to Ireland; Early telegraph station at Carmel Head (linked to Liverpool).
VISUAL SUSCEPTIBILITY		
Distance offshore- range		Shore up to 22.6km
Size of turbines potentially having low magnitude of effect		• All turbine sizes would be likely to exceed low magnitude of effect.
Size of turbines potentially having medium magnitude of effect		• Turbines below 145m would be likely to exceed medium magnitude of effect less than14km from shore. • Turbines 145-175m would be likely to exceed medium magnitude of effect less than18.8km from shore. • Turbines above 175m would be likely to exceed medium magnitude of effect.
Visual experience	*Seascape Pattern and Foci*	Foci along the coast tend to be Great Orme, Snowdonia, Puffin Island, the Skerries and Holyhead Mountain. Gwynt y Mor offshore wind farm lies to the east. Commercial vessels are apparent, especially the ferries around Holyhead.
	Contribution to the setting of a coast or seascape character area	Sea provides setting for Snowdonia to the north framed by Great Orme and Puffin Island. For most of the Anglesey AONB the sea provides the exposed open setting to the north sometimes framed by small low headlands with Gwynt y Mor potentially visible to the east.
	How seascape is experienced	Coast Path; beaches; settlements, caravan/chalet

		parks, recreational boating.
Key visual receptors	*In nationally designated landscapes*	Snowdonia: Extensive tracts on Conwy Mountain, Penmaen Bach, some at Penmaen Head, and rising up to the Carneddau. Anglesey AONB: Coast Path, Red Wharf Bay and Benllech beaches, Penmon Point, Moelfre, Point Lynas, Penrhyn beach, Bwrdd Arthur, Holyhead Mountain, Penrhos Coastal Park
	Outside nationally designated landscapes	Wales Coast Path Great Orme Country Park; Access land: Bwrdd Arthur, Mynydd Bodafon, some minor coastal heathlands. Access land: Several coastal areas including Cemlyn Bay and east and west of Amlwch
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		03: Red Wharf and Conwy Bays 04: North Wales Open Waters (part) 05: North-West Anglesey Open Waters 06: North Anglesey Coastal Waters 07: Holyhead Bay and The Skerries 08: West Anglesey Open Waters (part) 09: Holy Island West and Penrhos Bay (part)
Local seascape character areas: Anglesey and Snowdonia Seascape Character Assessments		2 Conwy Bay 3 Traeth Lafan 4 Menai Strait 5 Penmon 6 Red Wharf Bay to Moelfre 7 Dulas Bay 8 Amlwch and Cemaes 9 Cemlyn Bay 10 Carmel Head to Penrhyn 11 Holyhead 13 Holyhead Mountain 28 North-east of Anglesey 29 North of Anglesey 30 North-west of Anglesey 31 West of Anglesey (part)

Zone No: 4	Name: North Wales and North Anglesey Offshore
Location	
The area is located offshore between Great Orme and Holyhead Mountain on Anglesey.	
OVERALL SENSITIVITY	
Sensitivity	Medium
Summary	
The area lies in open sea offshore from Anglesey and the north Wales coast with the Isle of Man to the north. To the south east lies the Great Orme and Snowdonia but the area is closest to the north coast of Anglesey from Lynas Point running round west to Holy Island. Anglesey generally has a low plateau topography with resultant low cliffs and slopes, apart from the distinctive form of Holyhead Mountain which terminates the likely affected coastline to the west. Anglesey's northern coast is rocky and convex meaning development out to sea would be largely unscaled whilst its north west and east coasts have a series of small embayments and coves with associated small settlements and holiday accommodation in places. The main built coastal landmark is Wylfa nuclear power station but structures may be seen juxtaposed with onshore windfarms inland. The sea is open and exposed. Commercial vessels running to and from the Mersey ports and ferries issuing from Holyhead's busy harbour tend to pass between this zone and the coast. The area's susceptibility lies particularly in the elevated views from Great Orme Country Park to the south east, from the rural Anglesey coastal fringe with associated Coast Path and from Conwy Mountain and the Carneddau from the south. The area's value lies in its location offshore from the Anglesey AONB (and associated heritage coast) to the south, Snowdonia National Park and Great Orme Heritage coast to the south east, and scheduled monuments along the coast. Particularly sensitive receptors on Anglesey include users of Penmon Point, Red Wharf Bay and Holyhead Mountain and the coast has some tranquillity and remoteness especially towards the north.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
There is potential for combined cumulative effects on the Great Orme and Snowdonia if windfarms are located in the south east corner of the area due to the relative proximity to Gwynt y Mor. The area may have some ability to accommodate well-designed and appropriately spaced development (to achieve coherent and clearly separated arrays if possible) taking into account the buffers for the maximum height of turbine to blade tip in the visual susceptibility section below and located in line with the Stage 2 offshore wind farm guidance.	
VALUE- DESIGNATIONS	
Landscape designations	*Designation*: **Anglesey AONB**
	Relevant special qualities: Expansive views/seascapes Peace and tranquillity

		Islands around Anglesey
	Notes	The management plan does not expand on the special qualities but refers to the local seascape character assessment. Includes the Heritage Coast at Holy Island and the north coast.
	Designation	**Snowdonia National Park**
	Relevant special qualities	Diversity of high quality landscapes and coastal areas– ranging from coast rolling uplands to the rugged mountains. Areas of tranquillity and solitude.
	Notes	The mountains contribute to the coastal character providing a strong backcloth. The coastal slopes and peaks allow views out to sea from elevated locations.
Historic designations	*Registered historic landscapes*	North Arllechog; Penmon; Creuddyn Amlwch and Parys Mountain
	Historic parks and gardens	Penrhyn Castle; Bryn y Neuadd, Cestyll- view [west of Wylfa]
	Key scheduled monuments	Deganwy Castle SH 7879 Castell Caer Seion Hillfort SH 7577 / 7677 Bwrdd Arthur Hillfort SH 5881 Dinas Gynfor Hillfort SH 3895 / 3995 Caer y Twr Hillfort SH 2182- on Holyhead Mountain
Nature conservation designations	*SPA*	-
	SAC	-
	Ramsar	-
LANDMAP visual and sensory value in areas with sea views		Outstanding value at Holyhead Mountain, in pockets on the north coast and at Red Wharf Bay and Puffin Island. High value at the Great Orme, Snowdonia (Carneddau) and the majority of the Anglesey Coast.
SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	The mountains of Snowdonia to the south are large-scale whilst the coast of Anglesey is generally medium-scale with the sea expanding to large-scale to the north.
	Openness and enclosure	Ranges from moderately enclosed in the south east between Great Orme and Puffin Island increasing in openness to Point Lynas, and then the west.
	Coastal aspect	Primarily north with components of the north-east and north-west
	Coastal and hinterland form	The distinctive whaleback rocky limestone headland of the Great Orme forms the south eastern landmark and Snowdonia acts as the backcloth to the fairly straight

		coastline either dramatically reaching the coast to the east or setting back behind gentle coastal slopes to the west. Anglesey has a rocky and fine-grained north east and north west facing coast with medium-sized sloping cliffs and small headlands and occasional beaches and coves between stretches of intertidal rocks. The northern coast is finer grained still with small coves and low rocky cliffs on a convex coast. The hinterland on the island is relatively low lying with the exception of Holyhead Mountain.
Existing development	*Coastal settlement/ development pattern and foci*	The mainland coast has linear settlement form such as Penmaenmawr and Llanfairfechan set on the A55 and mainline railway, whilst to the north west Holyhead is a busy ferry port with a large harbour. Other coastal settlements on Anglesey are smaller and rural, eg Benllech and Moelfre, and have associated caravan parks. Wyllfa nuclear power station currently lies on the less settled north coast close to Amlwch.
	Marine development and use	Windfarms are visible to the south east. Large commercial vessels use the area to the south bound for the Mersey with ships waiting for pilots off Point Lynas. There is commercial fishing.
Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	This zone is wild and remote as open sea. The north coast of Anglesey is generally remote and rocky wild character and fairly tranquil only disturbed by the Wylfa nuclear power station and remains of the chemical works at Amlwch. The north east and north west coasts are moderately tranquil, reduced in summer by tourism, and by ferry traffic and other activity around Holyhead. Onshore wind farms and power lines modify the hinterland's tranquillity. The mainland coast is not tranquil to the east mainly due to the transport corridors but is more tranquil to the west away from the A55 and the mountains of Snowdonia to the south are highly tranquil with a wild character.
	Dark skies/ Lighting	The coast is mainly dark to the north with lighting associated with Holyhead, Bangor and other coastal settlements and with the A55. There are lighthouses at the Skerries, and Point Lynas. There is lighting associated with the windfarms some distance to the east.
Exposure		The northern and north eastern shores of Anglesey are most exposed.
Cultural associations	*Cultural associations*	Penmon Priory; Priestholm or Puffin Island - monastic settlement; Moelfre and the shipwreck of the Royal

		Charter; Bwrdd Arthur, Llanddona, an important hill top archaeological site; Holyhead - packet port and crossing to Ireland; Early telegraph station at Carmel Head (linked to Liverpool).
VISUAL SUSCEPTIBILITY		
Distance offshore- range		22.6km to 44km from shore
Size of turbines potentially having low magnitude of effect		• Turbines below 145m would not be likely exceed low magnitude of effect. • Turbines 145-175m would not be likely to exceed low magnitude of effect beyond 24.4km from shore. • Turbines 175-225m would not be likely to exceed low magnitude of effect beyond 28.5km from shore. • Turbines 225-300m would not be likely to exceed low magnitude of effect beyond 41.6km from shore. • Turbines 300-350m would be likely to exceed low magnitude of effect. • However, existing windfarms may modify the likely impacts.
Size of turbines potentially having medium magnitude of effect		• Turbines below 145m would be likely to exceed medium magnitude of effect less than14km from shore. • Turbines 145-175m would be likely to exceed medium magnitude of effect less than18.8km from shore. • Turbines above 175m would be likely to exceed medium magnitude of effect. • However, existing windfarms may modify the likely impacts.
Visual experience	*Seascape Pattern and Foci*	Foci along the coast tend to be Great Orme, Snowdonia, Puffin Island, the Skerries and Holyhead Mountain. Gwynt y Mor offshore wind farm lies to the south east. Commercial vessels are apparent between this zone and the coast, especially ferries around Holyhead.
	Contribution to the setting of a coast or seascape character area	The sea provides setting for Snowdonia to the north framed by Great Orme and Puffin Island. For most of the Anglesey AONB the sea provides the exposed open setting to the north sometimes framed by small low headlands with Gwynt y Mor potentially visible to the east.

	How seascape is experienced	Coast Path; beaches; settlements, caravan/chalet parks, recreational boating.
Key visual receptors	*In nationally designated landscapes*	Anglesey AONB: Coast Path, Red Wharf Bay and Benllech beaches, Penmon Point, Moelfre, Point Lynas, Penrhyn beach, Bwrdd Arthur, Holyhead Mountain, Penrhos Coastal Park Snowdonia: Extensive tracts on Conwy Mountain, Penmaen Bach, some at Penmaen Head, and rising up to the Carneddau.
	Outside nationally designated landscapes	Wales Coast Path Great Orme Country Park; Access land: Bwrdd Arthur, Mynydd Bodafon, some minor coastal heathlands. Access land: Coastal areas e.g. Cemlyn Bay, east and west of Amlwch
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		*Offshore from:* 03: Red Wharf and Conwy Bays 04: North Wales Open Waters (part) 05: North-West Anglesey Open Waters 06: North Anglesey Coastal Waters 07: Holyhead Bay and The Skerries 08: West Anglesey Open Waters (part) 09: Holy Island West and Penrhos Bay (part)
Local seascape character areas: Anglesey Seascape Character Assessment		*Offshore from:* 2 Conwy Bay 3 Traeth Lafan 4 Menai Strait 5 Penmon 6 Red Wharf Bay to Moelfre 7 Dulas Bay 8 Amlwch and Cemaes 9 Cemlyn Bay 10 Carmel Head to Penrhyn 11 Holyhead 13 Holyhead Mountain 28 North-east of Anglesey 29 North of Anglesey 30 North-west of Anglesey 31 West of Anglesey (part)

Zone No: 5	Name: North Wales and Anglesey Outer Offshore
Location	
The zone is located in the outer offshore area running from Liverpool Bay between North Wales and the Isle of Man south west to the St George's Channel.	
OVERALL SENSITIVITY	
Sensitivity	Medium/low
Summary	
The area lies in open sea at least 44km offshore from the Anglesey, North Wales and Llŷn peninsula coasts although the zone's northern edge is located around 22 km from the Isle of Man. To the south east there are the existing arrays at Gwynt y Mor and further arrays lie to the north east including Walney and West of Duddon Sands. Anglesey predominantly has a low plateau topography and rocky coastline with a distinctive high point at Holyhead Mountain. Development out to sea would be largely unscaled in views. More elevated views are possible north from the north Wales coast at Great Orme and Conwy Mountain. The Llŷn peninsula also has cliff top views to the north east towards the south western extent of the zone. The sea is open and exposed with commercial vessels running inshore from this zone to and from the Mersey ports, and ferries issue from Holyhead's busy harbour. The area's susceptibility lies predominantly in combined views from Anglesey and Llŷn AONBs offshore from Caernarfon Bay where development may be apparent in sunset conditions. The least susceptible area lies to the north east as this is located in further out to sea than existing wind, oil and gas development to the south and east. The value associated with the zone lies in its relationship with Anglesey and Llŷn AONBs and associated heritage coasts, Snowdonia National Park and Great Orme Heritage coast. Particularly sensitive receptor locations include Holyhead Mountain, Bardsey Island and the tip of the Llŷn peninsula, Point Lynas and Carmel Head.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
The zone has potential to accommodate all scales of offshore wind farm development if designed in a coherent manner and avoiding blocks that cover the entire horizon from viewpoints on shore. The part of the zone west of zone 7 and Caernarfon Bay is least able to accommodate development due to the relationship with the two AONBs and the potential for interference with sunsets, albeit at a distance. There is potential for cumulative impact to the east but it is unlikely to be significant for receptors on shore.	
VALUE- DESIGNATIONS	
Landscape designations — *Designation*	**Anglesey AONB**
Relevant special qualities	Expansive views/seascapes Peace and tranquillity

		Islands around Anglesey
	Notes	The management plan does not expand on the special qualities but refers to the local seascape character assessment. Includes the Heritage Coast at Holy Island and the north coast.
	Designation	**Snowdonia National Park**
	Relevant special qualities	Diversity of high quality landscapes and coastal areas– ranging from coast rolling uplands to the rugged mountains. Areas of tranquillity and solitude.
	Notes	The mountains contribute to the coastal character providing a strong backcloth. The coastal slopes and peaks allow views out to sea from elevated locations.
	Designation	**Llŷn AONB**
	Relevant special qualities	• Landscape, coast and sea • A clean environment and tranquillity
	Notes	The management plan expands on the special qualities. It states that Llŷn is an area of beautiful coastal landscape that offers striking views. These include from hilltops with excellent views in every direction. The sea has greatly influenced the area's character. The peninsula, particularly at its western point, is one of the few areas where peace and tranquillity can be found with the absence of large scale development and light. The area includes Heritage Coast along all the north coast.
Historic designations	*Registered historic landscapes*	North Arllechog; Penmon; Creuddyn Amlwch and Parys Mountain Lleyn and Bardsey
	Historic parks and gardens	Penrhyn Castle; Bryn y Neuadd, Cestyll- view [west of Wylfa]
	Key scheduled monuments	Deganwy Castle SH 7879 Castell Caer Seion Hillfort SH 7577 / 7677 Bwrdd Arthur Hillfort SH 5881 Dinas Gynfor Hillfort SH 3895 / 3995 Caer y Twr Hillfort SH 2182- on Holyhead Mountain Dinas Dinlle Hillfort SH 4356 Tre'r Ceiri Hillfort SH 3744 Garn Boduan Hillfort SH 3139 Carn Fadrun Hillfort SH 2835
Nature conservation designations	*SPA*	-

	SAC	-
	Ramsar	-
LANDMAP visual and sensory value in areas with sea views		Northern part of zone: Outstanding value at Holyhead Mountain, in pockets on the north coast and at Red Wharf Bay and Puffin Island. High value at the Great Orme, Snowdonia (Carneddau) and the majority of the Anglesey Coast. Southern part of zone: Outstanding value at Holyhead Mountain, Newborough Warren, Yr Eifl, Gyrn Ddu/Goch, the end of the Llŷn peninsula and Bardsey. High value elsewhere. A large proportion of the rest of the coast is high value.
SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	Northern part of zone: The mountains of Snowdonia to the south are large-scale whilst the coast of Anglesey is generally medium-scale with the sea expanding to large-scale to the north. Southern part of zone: The overall scale is large but feels small scale along indented coasts of Anglesey and Llŷn.
	Openness and enclosure	The zone itself is very open and exposed. Northern part of zone: The coast ranges from moderately enclosed in the south east between Great Orme and Puffin Island increasing in openness to Point Lynas, and then the west. Southern part of zone: The coast is open with views to the west.
	Coastal aspect	Northern part of zone: The coast is primarily orientated north with components of the north-east and north-west. Southern part of zone: The coasts of the bay generally face west ranging from north west to south west.
	Coastal and hinterland form	Northern part of zone: The distinctive whaleback rocky limestone headland of the Great Orme forms the south eastern landmark and Snowdonia acts as the backcloth to the coastline either dramatically reaching the coast to the east or setting back behind gentle coastal slopes to the west. Anglesey has a rocky and fine-grained north east and north west facing coast with medium-sized sloping cliffs and small headlands and occasional beaches and coves between stretches of intertidal rocks. The northern coast is finer grained still with small coves and low rocky cliffs on a convex coast. The hinterland on the island is relatively low lying with the exception of Holyhead Mountain. The Isle

		of Man lies closer to the north. Southern part of zone: The overall form of the zone to the east is a concave bay. The south west Anglesey coast is indented and rocky, with low cliffs or grassy slopes and numerous small headlands, interspersed with beaches, and dunes to the south east. The Anglesey hinterland is relatively low lying with the exception of Holyhead Mountain. On the mainland the coast line straightens in dunes and the man-made edge at Morfa Dinlle. Snowdonia is set back from the coastal plain. The Llŷn peninsula has a scalloped north and north west facing eroding coast with sloping cliffs ranging from around 25m AOD to 250mAOD where the hills meet the sea.
Existing development	*Coastal settlement/ development pattern and foci*	Northern part of zone: The mainland coast has linear settlement form such as Penmaenmawr and Llanfairfechan set on the A55 and mainline railway, whilst to the north west Holyhead is a busy ferry port with a large harbour. Other coastal settlements on Anglesey are smaller and rural, eg Benllech and Moelfre, and have associated caravan parks. Wylfa nuclear power station currently lies on the less settled north coast close to Amlwch. Southern part of zone: Settlement is fairly limited with the main settlements on Anglesey being Treaddur Bay and Rhosneigr. Airports at RAF Valley and Caernarfon, and the Ty Croes motor racing circuit are not widely visible except for some large warehouses and towers at RAF Valley. On the mainland, settlements are limited, with Morfa Dinlle, Trefor and Nefyn being the main foci.
	Marine development and use	Windfarms are visible to the south east and east. Large commercial vessels use the area to the south bound for the Mersey with ships waiting for pilots off Point Lynas. There is commercial fishing. To the south commercial shipping uses St George's Channel. There are very occasional yachts.
Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	This zone is wild and remote as open sea. Northern part of zone: The north coast of Anglesey is generally remote and rocky wild character and fairly tranquil only disturbed by the Wylfa nuclear power station and remains of the chemical works at Amlwch.

		The north east and north west coasts are moderately tranquil, reduced in summer by tourism, and by ferry traffic and other activity around Holyhead. Onshore wind farms and power lines modify the hinterland's tranquillity. The mainland coast is not tranquil to the east mainly due to the transport corridors but is more tranquil to the west away from the A55 and the mountains of Snowdonia to the south are highly tranquil with a wild character. Southern part of zone: On the Anglesey coast there are places of tranquillity between settlements and development. For instance, Ynys Llanddwyn is tranquil, combined with relative sense of wildness and remoteness, being an island just off an uninhabited forested 'peninsula'. Tranquillity is affected to an extent by low flying aircraft, jet skiers and noise from the Ty Croes motor-racing circuit. On the mainland, the coast is moderately tranquil although affected by closeness of A499 in parts. The sense of remoteness and tranquillity increases inland on the elevated slopes of Snowdonia. The north-western slopes of the Llŷn peninsula have a greater sense of tranquillity and remoteness and vehicular access remains limited to only a few locations.
	Dark skies/ Lighting	The zone itself is dark with no sources of light apart from occasional shipping. Northern part of zone: On Anglesey, lighting is concentrated in settlements and around RAF Valley airfield and nearby settlements at Valley, Holyhead and Rhosneigr, reducing to the south to a dark area. There is a lighthouse at South Stack. On the mainland it is dark away from Caernarfon with the A487 and A499 and related settlements are the main sources. On Llŷn, lighting is confined to the small settlements.
Exposure		The zone itself is very exposed to prevailing south westerlies.
Cultural associations	*Cultural associations*	Northern part of zone: Penmon Priory; Priestholm or Puffin Island - monastic settlement; Moelfre and the shipwreck of the Royal Charter; Bwrdd Arthur, Llanddona, an important hill top archaeological site; Holyhead - packet port and crossing to Ireland; Early telegraph station at Carmel Head (linked to Liverpool). Southern part of zone: Llŷn has attracted artists to paint views of the sea, sunset and coastline. Local

		artists include Elis Gwyn Jones, Emrys Parry and Rob Piercy.
VISUAL SUSCEPTIBILITY		
Distance offshore- range		Beyond 44km from shore
*Size of turbines potentially having low magnitude of effect**		• All turbines below 350m are likely to have less than low magnitude of effect. • Existing windfarms may modify the likely impacts towards the east.
*Size of turbines potentially having medium magnitude of effect**		• All turbines below 350m are likely to have less than medium magnitude of effect. • Existing windfarms may modify the likely impacts towards the east.
Visual experience	*Seascape Pattern and Foci*	Within the zone itself there are no patterns or foci as open sea. Northern part of zone: Foci along the Welsh coast tend to be Great Orme, Snowdonia, Puffin Island, the Skerries and Holyhead Mountain. Gwynt y Mor offshore wind farm lies to the south east. Commercial vessels are apparent between this zone and the coast, especially the ferries around Holyhead. The Isle of Man lies closer to the north. Southern part of zone: Views west out to the zone and to the sunset, some framed by the headlands and landform of the enclosing coasts. Views across the bay either from Anglesey to the Llŷn peninsula and its peaks such as Yr Eifl, or northwards from Llŷn to the lower coast of Anglesey. Snowdonia provides the backcloth to the east.
	Contribution to the setting of a coast or seascape character area	Northern part of zone: The sea provides distant setting for Snowdonia to the north framed by Great Orme and Puffin Island. For most of the Anglesey AONB the sea provides the exposed open setting to the north sometimes framed by small low headlands with Gwynt y Mor potentially visible to the east. Southern part of zone: The sweep of the bay has an important role as setting to the adjoining coasts. Llŷn peninsula is defined by its relationship with the sea on both sides.
	How seascape is experienced	Northern part of zone: Coast Path; beaches; settlements, caravan/chalet parks, recreational boating. Southern part of zone: Coast Path; beaches; open access land such as on Yr Eifl and Gyrn Goch;

		settlements, caravan/chalet parks, recreational boating.
Key visual receptors	*In nationally designated landscapes*	Northern part of zone: Anglesey AONB: Coast Path, Red Wharf Bay and Benllech beaches, Penmon Point, Moelfre, Point Lynas, Penrhyn beach, Bwrdd Arthur, Holyhead Mountain, Penrhos Coastal Park Snowdonia: Extensive tracts on Conwy Mountain, Penmaen Bach, some at Penmaen Head, and rising up to the Carneddau. Southern part of zone: On Anglesey, Ynys Llanddwyn and Newborough Forest are popular destinations for walkers and together with Maltreath Bay, Abberffraw Bay, beaches around Rhosneigr and Trearddur Bay. These have scenic views across Caernarfon Bay to the mountains of the Llŷn Peninsula and open views west. Morfa Dinlle has access land from which there are views across the bay. On Llŷn, there are numerous views from elevated land, including from Bardsey Island, Yr Eifl, and Gyrn Ddu, Gyrn Goch and Bwlch Mawr (all open access land) and from some coastal land such as Porth y Pistyll and Porth Nant.
	Outside nationally designated landscapes	Northern part of zone: Wales Coast Path: Great Orme Country Park; Access land: Bwrdd Arthur, Mynydd Bodafon, some minor coastal heathlands, Cemlyn Bay, east and west of Amlwch Southern part of zone: Wales Coast Path
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		Offshore from: 01: Dee Estuary (Wales) 02: Colwyn Bay and Rhyl Flats 03: Red Wharf and Conwy Bays 04: North Wales Open Waters (part) 05: North-West Anglesey Open Waters 06: North Anglesey Coastal Waters 07: Holyhead Bay and The Skerries 08: West Anglesey Open Waters 09: Holy Island West and Penrhos Bay 12: Llŷn and South West Anglesey Open Waters 13: Llŷn and Bardsey Island
Local seascape character areas: Anglesey Seascape Character Assessment		*Northern area offshore from:* 2 Conwy Bay 3 Traeth Lafan

	4 Menai Strait 5 Penmon 6 Red Wharf Bay to Moelfre 7 Dulas Bay 8 Amlwch and Cemaes 9 Cemlyn Bay 10 Carmel Head to Penrhyn 11 Holyhead 13 Holyhead Mountain 28 North-east of Anglesey 29 North of Anglesey 30 North-west of Anglesey 31 West of Anglesey (part) *Southern area offshore from:* 14 Rhoscolyn 15 Rhosneigr 16 Malltraeth 17 Caernarfon 18 Abermenai 31 West of Anglesey (part) 32 Caernafon Bay

Zone No: 6	Name: Caernarfon Bay Inshore
Location	
The area is the inshore area located from North Stack, Holyhead Mountain on Anglesey to Braich y Pwll on the tip of the Llŷn peninsula including Caernarfon Bay.	
OVERALL SENSITIVITY	
Sensitivity	High
Summary	
The distinctive form of Holyhead Mountain forms the western tip of Anglesey's south western coast but further east this becomes a small-scale indented rocky shore with low cliffs in places and dunes at Newborough Warren. Llandwyn Island frames views. There are views across the bay towards the Llŷn peninsula with its distinctive pointed hills around Yr Eifl. The bay is simple and gently curved south of the Menai Straight allowing views framed by both the Anglesey coast the Llŷn peninsula. Snowdonia forms the backcloth to this coast and the bay as a whole. The Llŷn peninsula itself has a relatively small-scale indented coast of medium to high cliffs with small bays and coves. There are very dramatic views from the coastal edge and from the high hills and cliffs around Yr Eifl. The peninsula has few settlements and feels tranquil and remote, which increases towards the south-west. It also has cultural significance with features such as Bardsey Island to the south-west and Tre'r Ceiri prehistoric hillfort at Yr Eifl. The area's susceptibility lies in being overlooked by from land to the north, east and south, including across Caernarfon Bay towards the distinctive hills of the Llŷn AONB; the important cultural significance of Bardsey Island and the Llŷn AONB, with its unspoilt views, tranquillity and sense of place; the potential for prominent headlands and topography (eg Yr Eifl) to frame views and give scale to development; the elevated panoramic views of the bay and sense of remoteness and tranquillity around Yr Eifl and in Snowdonia; views from Anglesey coast including South Stack south and west and framed views from various coves and bays and iconic views from Ynys Llanddwyn; and the potential for views of development silhouetted against the sun and the sunset. The area's value lies in its proximity to, and being overlooked by three national landscape designations- Anglesey AONB and Llŷn AONB (both with heritage coasts) and Snowdonia National Park.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
The area is too sensitive to have ability to accommodate any offshore wind farm development.	
VALUE- DESIGNATIONS	

Landscape designations	*Designation*	**Anglesey AONB**
	Relevant special qualities	• Expansive views/seascapes • Peace and tranquillity • Islands around Anglesey
	Notes	The management plan does not expand on the special

		qualities but refers to the local seascape character assessment. The area includes the Heritage Coasts at Holyhead Mountain and Aberffraw Bay.
	Designation	**Llŷn AONB**
	Relevant special qualities	• Landscape, coast and sea • A clean environment and tranquillity
	Notes	The management plan expands on the special qualities. It states that the Llŷn is an area of beautiful coastal landscape that offers striking views. These include panoramic views from isolated hilltops in every direction, with notably dramatic, highly elevated views from around Yr Eifl, over Caernarfon Bay. The sea has greatly influenced the area's character. The peninsula, particularly at its western point, is one of the few areas where peace and tranquillity can be found with the absence of large scale development and light. The area includes Heritage Coast along all the north coast.
	Designation	**Snowdonia National Park**
	Relevant special qualities	Diversity of high quality landscapes and coastal areas– ranging from coast rolling uplands to the rugged mountains. Areas of tranquillity and solitude.
	Notes	The mountains contribute to the coastal character providing a strong backcloth. The peaks and coastal slopes allow views out to sea from elevated locations.
Historic designations	*Registered historic landscapes*	Lleyn and Bardsey Island
	Historic parks and gardens	-
	Key scheduled monuments	Caer y Twr Hillfort SH 2182 (Holyhead Mountain) Dinas Dinlle Hillfort SH 4356 Tre'r Ceiri Hillfort SH 3744 Garn Boduan Hillfort SH 3139 Carn Fadrun Hillfort SH 2835
Nature conservation designations	*SPA*	Aberdaron Coast and Bardsey Island
	SAC	Lleyn Peninsula and the Sarnau
	Ramsar	-
LANDMAP visual and sensory value in areas with sea views		Outstanding value at Holyhead Mountain, Newborough Warren, Yr Eifl, Gyrn Ddu/Goch, the end of the Llŷn peninsula and Bardsey. High value elsewhere. A large proportion of the rest of the coast is high value.

SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	The overall scale is large scale but the coast feels small scale where it is indented such as on Anglesey and Llŷn.
	Openness and enclosure	The area is open with views to the west.
	Coastal aspect	The coasts of the bay generally face west ranging from north west to south west.
	Coastal and hinterland form	The overall form of the unit is a concave bay. The south west Anglesey coast is an indented rocky coast with low cliffs or grassy slopes and numerous small headlands interspersed with a few beaches, and dunes to the south east. The hinterland on the island is relatively low lying with the exception of Holyhead Mountain. On the mainland the coast line straightens in dunes and the man-made edge at Morfa Dinlle. Snowdonia is set back from the coastal plain. The Llŷn peninsula has a scalloped north and north west facing eroding coast with sloping cliffs ranging from around 25m AOD to 250mAOD where the hills meet the sea.
Existing development	*Coastal settlement/ development pattern and foci*	Settlement is fairly limited with the main settlements on Anglesey being Treaddur Bay and Rhosneigr. Airports at RAF Valley and Caernarfon, and the Ty Croes motor racing circuit are not widely visible except for some large warehouses and towers at RAF Valley. On the mainland, settlements are limited, with Morfa Dinlle, Trefor and Nefyn being the main foci.
	Marine development and use	Yachts, limited leisure boating and jet skiers. Sailing from Trefor and Nefyn.
Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	On the Anglesey coast there are places of tranquillity between settlements and development. For instance, Ynys Llanddwyn is tranquil, combined with relative sense of wildness and remoteness, being an island just off an uninhabited, afforested 'peninsula'. Tranquillity is affected to an extent by low flying aircraft, jet skiers and noise from the Ty Croes motor-racing circuit. On the mainland, the coast is moderately tranquil although affected by closeness of A499 in parts. The sense of remoteness and tranquillity increases inland on the elevated slopes of Snowdonia. The north-western slopes of the Llŷn peninsula have a greater sense of tranquillity and remoteness as development and vehicular access remains limited to only a few locations.

	Dark skies/ Lighting	On Anglesey, lighting is concentrated around RAF Valley airfield and nearby settlements at Valley, Holyhead and Rhosneigr, reducing to the south to a dark area. There is a lighthouse at South Stack. On the mainland it is dark away from Caernarfon, with the A487 and A499 and related settlements are the main sources. On Llŷn, lighting is confined to the small settlements.
Exposure		Very exposed to prevailing south westerlies
Cultural associations	*Cultural associations*	Llŷn has attracted artists to paint views of the sea, sunset and coastline. Local artists include Elis Gwyn Jones, Emrys Parry and Rob Piercy.
VISUAL SUSCEPTIBILITY		
Distance offshore- range		Shore up to 22.6km
Size of turbines potentially having low magnitude of effect		• All turbine sizes would be likely to exceed low magnitude of effect.
Size of turbines potentially having medium magnitude of effect		• Turbines below 145m would be likely to exceed medium magnitude of effect less than14km from shore. • Turbines 145-175m would be likely to exceed medium magnitude of effect less than18.8km from shore. • Turbines above 175m would be likely to exceed medium magnitude of effect.
Visual experience	*Seascape Pattern and Foci*	Views west out to sea and to the sunset, some framed by the headlands and landform of the enclosing coasts. Views across the bay either from Anglesey to the Llŷn peninsula and its peaks such as Yr Eifl, or northwards from Llŷn to the lower coast of Anglesey. Snowdonia provides the backcloth to the east.
	Contribution to the setting of a coast or seascape character area	The sweep of the bay has an important role as setting to the adjoining coasts. Llŷn peninsula is defined by its relationship with the sea on both sides.
	How seascape is experienced	Wales Coast Path; beaches; open access land such as on Yr Eifl and Gyrn Goch; settlements, caravan/chalet parks, recreational boating.
Key visual receptors	*In nationally designated landscapes*	On Anglesey, Ynys Llanddwyn and Newborough Forest are popular destinations for walkers, together with Malltreath Bay, Abberffraw Bay, beaches around Rhosneigr and Trearddur Bay. These have iconic scenic views across Caernarfon Bay to the mountains

		of the Llŷn Peninsula. Morfa Dinlle has access land from which there are views across the bay. On Llŷn, there are dramatic views from distinctive hills- Yr Eifl, and Gyrn Ddu, Gyrn Goch and Bwlch Mawr (all open access land) and some coastal land such as Porth y Pistyll and Porth Nant. The Nefyn area is very popular for visitors in summer, together with a few remoter sandy beaches further down the peninsula.
	Outside nationally designated landscapes	Wales Coast Path
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		08: West Anglesey Open Waters (part) 09: Holy Island West and Penrhos Bay 10: Menai Strait 11: Caernarfon Bay 12: Llŷn and South West Anglesey Open Waters (part) 13: Llŷn and Bardsey Island (part)
Local seascape character areas: Anglesey Seascape Character Assessments		14 Rhoscolyn 15 Rhosneigr 16 Malltraeth 17 Caernarfon 18 Abermenai 31 West of Anglesey (part) 32 Caernafon Bay

Zone No: 7	Name: Caernarfon Bay Offshore
Location	
The zone is located offshore from Holyhead Mountain on Anglesey to Braich y Pwll on the tip of the Llŷn peninsula.	
OVERALL SENSITIVITY	
Sensitivity	High/medium
Summary	
The zone lies in open sea west of Caernarfon Bay. On the coast, the distinctive form of Holyhead Mountain forms the western tip of Anglesey's south western coast but further east this becomes a small-scale indented rocky shore with low cliffs in places and dunes at Newborough Warren. Ynys Llanddwyn frames views. There are views across the bay towards the Llŷn peninsula. The eastern tip of this zone would be seen in juxtaposition with this if viewing from Holyhead Mountain towards Bardsey Island or vice-versa. The coastal geometry of the bay is simple and gently curved south of the Menai Straight allowing views to be framed by both the Anglesey coast the Llŷn peninsula. Snowdonia forms the backcloth to this coast and the bay as a whole, although set back from the coast some distance. The Llŷn peninsula itself has a relatively small-scale indented coast of medium to high cliffs with small bays and coves. There are views possible from the coastal edge and from the high hills adjacent including Yr Eifl with its prehistoric settlement. The peninsula has few settlements and feels tranquil and remote, which increases towards the west. It also has cultural significance with features such as Bardsey Island to the south west. These areas have views across the this zone, more especially at higher elevations. The area's susceptibility lies in being overlooked from rising land to the east; the important cultural significance of Bardsey Island and the Llŷn AONB, with its unspoilt views, tranquillity and sense of place; the potential for prominent headlands and topography (eg Yr Eifl) to frame views and give scale to development; the elevated panoramic views of the bay and sense of remoteness and tranquillity in Snowdonia; views from Anglesey coast including Holyhead Mountain south and west and framed views from various coves and bays and from Newborough Warren; and the potential for views of development to be silhouetted against the sun and the sunset. The zone's value lies in its visual relationship with three national landscape designations- Anglesey AONB and Llŷn AONB (both with heritage coasts) and Snowdonia National Park – the latter two with much elevated ground.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
The area has limited ability to accommodate offshore wind farms. Larger turbines should be avoided to reduce visual prominence, with any development being located in the least sensitive area to the north west away from the Llŷn peninsula and Bardsey Island and a central location in the sweep of the bay.	

VALUE- DESIGNATIONS		
Landscape designations	*Designation*	**Anglesey AONB**
	Relevant special qualities	• Expansive views/seascapes • Peace and tranquillity • Islands around Anglesey
	Notes	The management plan does not expand on the special qualities but refers to the local seascape character assessment. The area includes the Heritage Coasts at Holyhead Mountain and Aberffraw Bay.
	Designation	**Llŷn AONB**
	Relevant special qualities	• Landscape, coast and sea • A clean environment and tranquillity
	Notes	The management plan expands on the special qualities. It states that Llŷn is an area of beautiful coastal landscape that offers striking views. These include from hilltops with excellent views in every direction. The sea has greatly influenced the area's character. The peninsula, particularly at its western point, is one of the few areas where peace and tranquillity can be found with the absence of large scale development and light. The area includes Heritage Coast along all the north coast.
	Designation	**Snowdonia National Park**
	Relevant special qualities	Diversity of high quality landscapes and coastal areas– ranging from coast rolling uplands to the rugged mountains. Areas of tranquillity and solitude.
	Notes	The mountains contribute to the coastal character providing a strong backcloth. The peaks and coastal slopes allow views out to sea from elevated locations.
Historic designations	*Registered historic landscapes*	Lleyn and Bardsey Island
	Historic parks and gardens	-
	Key scheduled monuments	Caer y Twr Hillfort SH 2182 (Holyhead Mountain) Dinas Dinlle Hillfort SH 4356 Tre'r Ceiri Hillfort SH 3744 Garn Boduan Hillfort SH 3139 Carn Fadrun Hillfort SH 2835
Nature conservation designations	*SPA*	Aberdaron Coast and Bardsey Island

	SAC	Lleyn Peninsula and the Sarnau
	Ramsar	-
LANDMAP visual and sensory value in areas with sea views		Outstanding value at Holyhead Mountain, Newborough Warren, Yr Eifl, Gyrn Ddu/Goch, the end of the Llŷn peninsula and Bardsey. High value elsewhere. A large proportion of the rest of the coast is high value.
SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	The overall scale is large but feels small scale along indented coasts of Anglesey and Llŷn.
	Openness and enclosure	The coast is open, with views to the west across this zone.
	Coastal aspect	The coasts of the bay generally face west ranging from north west to south west.
	Coastal and hinterland form	The overall form of the zone to the east is a concave bay. The south west Anglesey coast is indented and rocky, with low cliffs or grassy slopes and numerous small headlands, interspersed with beaches, and dunes to the south east. The Anglesey hinterland is relatively low lying with the exception of Holyhead Mountain. On the mainland the coast line straightens in dunes and the man-made edge at Morfa Dinlle. Snowdonia is set back from the coastal plain. The Llŷn peninsula has a scalloped north and north west facing eroding coast with sloping cliffs ranging from around 25m AOD to 250mAOD where the hills meet the sea.
Existing development	*Coastal settlement/ development pattern and foci*	Settlement is fairly limited with the main settlements on Anglesey being Treaddur Bay and Rhosneigr, Airports at RAF Valley and Caernarfon, and the Ty Croes motor racing circuit are not widely visible except for some large warehouses and towers at RAF Valley. On the mainland, settlements are limited, with Morfa Dinlle, Trefor and Nefyn being the main foci.
	Marine development and use	Commercial shipping using St George's Channel. Very occasional yachts.
Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	The zone itself is wild and remote. On the Anglesey coast there are places of tranquillity between settlements and development. For instance, Ynys Llanddwyn is tranquil, combined with relative sense of wildness and remoteness, being an island just off an uninhabited forested 'peninsula'. Tranquillity is affected to an extent by low flying aircraft, jet skiers and noise from the Ty Croes motor-racing circuit. On the mainland, the coast is moderately tranquil

		although affected by closeness of A499 in parts. The sense of remoteness and tranquillity increases inland on the elevated slopes of Snowdonia. The north-western slopes of the Llŷn peninsula have a greater sense of tranquillity and remoteness and vehicular access remains limited to only a few locations.
	Dark skies/ Lighting	The zone itself is dark with no sources of light. On Anglesey, lighting is concentrated in settlements and around RAF Valley airfield and nearby settlements at Valley, Holyhead and Rhosneigr, reducing to the south to a dark area. There is a lighthouse at South Stack. On the mainland it is dark away from Caernarfon with the A487 and A499 and related settlements are the main sources. On Llŷn lighting is confined to the small settlements.
Exposure		Very exposed to prevailing south westerlies
Cultural associations	*Cultural associations*	Llŷn has attracted artists to paint views of the sea, sunset and coastline. Local artists include Elis Gwyn Jones, Emrys Parry and Rob Piercy.
VISUAL SUSCEPTIBILITY		
Distance offshore- range		22.6km to 44km from shore
Size of turbines potentially having low magnitude of effect		• Turbines below 145m would not be likely exceed low magnitude of effect. • Turbines 145-175m would not be likely to exceed low magnitude of effect beyond 24.4km from shore. • Turbines 175-225m would not be likely to exceed low magnitude of effect beyond 28.5km from shore. • Turbines 225-300m would not be likely to exceed low magnitude of effect beyond 41.6km from shore. • Turbines 300-350m would be likely to exceed low magnitude of effect.
Size of turbines potentially having medium magnitude of effect		• Turbines below 145m would be likely to exceed medium magnitude of effect less than14km from shore. • Turbines 145-175m would be likely to exceed medium magnitude of effect less than18.8km from shore. • Turbines above 175m would be likely to exceed

		medium magnitude of effect.
Visual experience	*Seascape Pattern and Foci*	Views west out to the zone and to the sunset, some framed by the headlands and landform of the enclosing coasts. Views across the bay either from Anglesey to the Llŷn peninsula and its peaks such as Yr Eifl, or northwards from Llŷn to the lower coast of Anglesey. Snowdonia provides the backcloth to the east.
	Contribution to the setting of a coast or seascape character area	The bay to the east has an important role as setting to the adjoining coasts, but this zone also contributes to this. Llŷn peninsula is defined by its relationship with the sea on both sides.
	How seascape is experienced	Coast Path; beaches; open access land such as on Yr Eifl and Gyrn Goch; settlements, caravan/chalet parks, recreational boating.
Key visual receptors	*In nationally designated landscapes*	On Anglesey, Ynys Llanddwyn and Newborough Forest are popular destinations for walkers and together with Maltreath Bay, Abberffraw Bay, beaches around Rhosneigr and Trearddur Bay. These have scenic views across Caernarfon Bay to the mountains of the Llŷn Peninsula and open views west. Morfa Dinlle has access land from which there are views across the bay. On Llŷn, there are numerous views from elevated land, including from Bardsey Island, Yr Eifl, and Gyrn Ddu, Gyrn Goch and Bwlch Mawr (all open access land) and from some coastal land such as Porth y Pistyll and Porth Nant.
	Outside nationally designated landscapes	Wales Coast Path
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		*Offshore from:* 08: West Anglesey Open Waters (part) 09: Holy Island West and Penrhos Bay 10: Menai Strait 11: Caernarfon Bay 12: Llŷn and South West Anglesey Open Waters (part) 13: Llŷn and Bardsey Island (part)
Local seascape character areas: Anglesey Seascape Character Assessments		*Offshore from:* 14 Rhoscolyn 15 Rhosneigr 16 Malltraeth 17 Caernarfon 18 Abermenai

	31 West of Anglesey (part) 32 Caernafon Bay

Zone No: 8	Name: Cardigan Bay north Inshore
Location	
The zone is the inshore area located from Braich y Pwll on the tip of the Llŷn peninsula to just south of Aberystwyth, including Tremadog Bay.	
OVERALL SENSITIVITY	
Sensitivity	High
Summary	
This large northern sweep of Cardigan Bay includes the remote, tranquil, indented rocky Llŷn peninsula, with Bardsey Island to the west and the gentler sweep of embayed coastline including Tremadog Bay to the east with the backcloth of Snowdonia. Llŷn has a culturally important seascape. Harlech Castle to the east is a World Heritage Site. Views into, and across the bay are framed by the mountains and hills of Snowdonia and Llŷn – the latter being seen from Meirionnydd in silhouette at sunset. The distinctive estuaries at Porthmadog, Mawddach and Aberdyfi also offer framed views in places. The area is sparsely settled on the southern Llŷn coast west of Abersoch. Elsewhere, the predominantly rural coast also includes a series of coastal resorts and some large holiday parks. Views are possible from the many elevated areas of Llŷn and Snowdonia, as well as along the coastal edge, particularly from headlands in western parts of the Llŷn peninsula. The area's susceptibility lies in: its embayed character both as whole, overlooked from three sides, and as a series of smaller-scale bays; the important cultural significance of Bardsey Island and the Llŷn AONB, with its unspoilt views, remoteness, tranquillity and sense of place; the potential for prominent headlands to frame views and give scale to development; the elevated panoramic views of the bay and sense of remoteness and tranquillity in Snowdonia; views from Harlech Castle World Heritage Site and Criccieth Castle; and the potential for views of development silhouetted against the sun and by the sunset. The area's value lies in its proximity to, and overlooking from Llŷn AONB (with heritage coast) and Snowdonia National Park.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
The area is too sensitive to have ability to accommodate any offshore wind farm development.	
VALUE- DESIGNATIONS	

Landscape designations	*Designation*	**Llŷn AONB**
	Relevant special qualities	• Landscape, coast and sea • A clean environment and tranquillity
	Notes	The management plan expands on the special qualities. It states that Llŷn is an area of beautiful coastal landscape that offers striking views. These include from hilltops with excellent views in every direction. The sea has greatly influenced the area's

		character. The peninsula, particularly at its western point, is one of the few areas where peace and tranquillity can be found with the absence of large scale development and light. The area is Heritage Coast on the western part of its southern coast.
	Designation	**Snowdonia National Park**
	Relevant special qualities	Diversity of high quality landscapes and coastal areas– ranging from coast rolling uplands to the rugged mountains. Areas of tranquillity and solitude.
	Notes	The mountains contribute to the coastal character providing a strong backcloth. In addition to the coast, the coastal slopes and peaks allow views out to sea from elevated locations.
	Designation	**Ceredigion Heritage Coast**
	Relevant special qualities	Special qualities are not defined.
	Notes	The Ceredigion Heritage Coast was established in 1982 and comprises four separate sections of coast, two of which are in this area: • Borth – Clarach • Monks Cave – Llanrhystud (part) It is generally associated with the dunes and coastline at Ynyslas to the north and a more varied hilly coastline with cliffs to the south.
Historic designations	*Registered historic landscapes*	Llŷn and Bardsey Island Ardudwy Aberglaslyn around Porthmadog Mawddach Dysynni Valley, Upland Ceredigion
	Historic parks and gardens	Plas yn Rhiw Portmeirion
	Key scheduled monuments	Carn Fadrun Hillfort SH 2835 [inland] Criccieth Castle (also Guardianship site) SH 4937 Moel y Gest Hillfort SH 5538 Moel Goedog Hillfort SH 6132 Harlech Castle (also Guardianship and World Heritage Site) SH 5831 Tal y Garreg Hillfort SH5703 Aberystwyth Castle SN 5781 Pendinas Hillfort SN 5880
Nature conservation designations	*SPA*	Aberdaron Coast and Bardsey Island

	SAC	Lleyn Peninsula and the Sarnau
	Ramsar	-
LANDMAP visual and sensory value in areas with sea views		Outstanding value at the end of the Llŷn peninsula and Bardsey Island, on Snowdonia's peaks, the Mawddach estuary, Dyfi estuary and parts of upland Ceredigion. High value on parts of the coast on Llŷn, Snowdonia's coast-facing slopes and Ceredigion's coast.
SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	Large scale of Cardigan Bay
	Openness and enclosure	Open to the south and west, although headlands provide some framing of views on the Llŷn peninsula. The estuaries are bounded by higher landform and in the case of the Mawddach and Dyfi estuaries, there are framed views out to sea.
	Coastal aspect	Predominantly south, south west and west
	Coastal and hinterland form	The overall form is the northern sweep of Cardigan Bay. Llŷn is an indented peninsula with sloping rocky cliffs and sandy beaches. Further east there is low lying land and coastal plain with shallow scalloped bays, straight stretches of coast and dunes. Snowdonia (Rhinogydd and Cader Idris) act as a strong backcloth with coast facing slopes. The coastline is interrupted by three major estuaries- Porthmadog, Mawddach and Dyfi.
Existing development	*Coastal settlement/ development pattern and foci*	Llŷn has few settlements to the west of Abersoch. They increase in size and frequency to the east, including the larger coastal resort of Pwhelli, and Criccieth with its castle, Porthmadog, Harlech with its castle, Barmouth and Aberdyfi. There are intervening smaller settlements and some large caravan sites fronting the coast eg at Morfa Dyffryn and Tywyn.
	Marine development and use	Commercial fishing, recreational use e.g. jetskis, sailing.
Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	The exposed peninsulas of western Llŷn are the most remote, tranquil and wild. The coast to the east is more settled, including busy holiday resorts and some caravan parks. Apart from Llŷn, tranquillity and remoteness are experienced mainly on the Snowdonia and Ceredigion uplands.
	Dark skies/ Lighting	The area is darker further west, with lighting being limited to larger coastal settlements and some holiday parks to the east. The uplands are also dark. There is

		a lighthouse at the St Tudwal's Islands.
Exposure		Exposed to south westerlies, although headlands provide some shelter on the Llŷn peninsula.
Cultural associations	*Cultural associations*	Llŷn has attracted artists to paint views of the sea, sunset and coastline. Local artists include Elis Gwyn Jones, Emrys Parry and Rob Piercy. Cantre'r Gwaelod legend of drowned lands. Harlech is mentioned in the Mabinogi tales. Snowdonia is historically a place for landscape painters dating back to C18 eg Cader Idris.
VISUAL SUSCEPTIBILITY		
Distance offshore- range		Shore up to 22.6km
Size of turbines potentially having low magnitude of effect		• All turbine sizes would be likely to exceed low magnitude of effect.
Size of turbines potentially having medium magnitude of effect		• Turbines below 145m would be likely to exceed medium magnitude of effect less than14km from shore. • Turbines 145-175m would be likely to exceed medium magnitude of effect less than18.8km from shore. • Turbines above 175m would be likely to exceed medium magnitude of effect.
Visual experience	*Seascape Pattern and Foci*	There are views across the bay between the mainland and the Llŷn peninsula. Snowdonia acts as a strong backcloth to the east and also allows commanding views across the bay out to sea.
	Contribution to the setting of a coast or seascape character area	The unspoilt simple sweep of the bay and seascape complements the varied coastline of Llŷn and provides the setting for Snowdonia. The bay is framed by the peninsula headlands and Snowdonia.
	How seascape is experienced	Views from Snowdonia west along the Llŷn peninsula and out to sea and south west across the bay. From Harlech and its castle elevated panoramic views are seen, across Tremadog Bay, with the hills of the Llŷn peninsula acting as a backdrop. A key feature is the sunset across the bay. Views from Llŷn along the coast towards Snowdonia. Views from footpath and open access land in Snowdonia and from Cambrians to south. Views from peaks of Snowdonia (the Rhinogs and Cader Idris) and from foothills.

		Views from estuary mouths eg Mawddach and Dovey eg Ynys Las,. From coast path. From 'A' roads and coast railway.
Key visual receptors	*In nationally designated landscapes*	End of the Llŷn peninsula including Braich y Pwll, and Bardsey Island/Mynydd Enlli. Aberdaron Around Trwyn Cilan. Moel-y-Gest environs Portmeirion gardens. Harlech Castle Users of Snowdonia open access land and Coast Path. Aberdovey seafront
	Outside nationally designated landscapes	Wales Coast Path Criccieth Castle Ynyslas dunes Pendinas (Aberystwyth)
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		12: Llŷn and South West Anglesey Open Waters (part) 13: Llŷn and Bardsey Island (part) 14: Tremadog Bay and Dwyryd Estuary 15: Cardigan Bay (north) and Estuaries 16: Cardigan Bay (south) (part) 17: Outer Cardigan Bay (part)
Local seascape character areas: Snowdonia Seascape Character Assessments		19 Criccieth to Mochras 20 Porthmadog and Glaslyn Estuary 21 Dwyryd Estuary and Morfa Harlech 22 Mochras to Fairbourne and Sarn Badrig 23 Mawddach Estuary 24 Fairbourne to Tonfannau 25 Tywyn and Sarn-Y-Bwlch 26 Borth 27 Dyfi Estuary 33 Tremadog Bay 34 Barmouth Bay 35 Aberdyfi Bay 36 Cardigan Bay

Zone No: 9	Name: Cardigan Bay central inshore
Location	
The zone is the inshore area of central Cardigan Bay from just south of Aberystwyth to Newquay.	
OVERALL SENSITIVITY	
Sensitivity	High/medium
Summary	
This small central part of Cardigan Bay is bounded by a gently curving stretch of coast with a few areas of moderate height cliffs and small scale indentations and some small bays, most notably at New Quay. Coastal slopes are particular features. Settlement is generally rural and nucleated. Use of the bay is limited to commercial and leisure fishing, a small amount of leisure sailing and beach related activities. The area's susceptibility lies in its central location in Cardigan Bay with high visibility from the arc of surrounding land, the lack of any existing development offshore and very limited marine activity, the openness of the coast which does not have any scale out to sea, the coast being predominantly rural with tranquil stretches and only a few small clustered sensitive traditional settlements such as Aberaeron and New Quay, the presence of the Coast Path, the backcloth of Snowdonia to the north and views to the west which could result in silhouetting of turbines, including against sunsets. The areas value lies in the proximity and views from stretches of Ceredigion Heritage Coast and the scheduled monument at Pendinaslochdyn Hillfort.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
The area has very limited ability to accommodate offshore windfarms due to views from the Ceredigion Heritage Coast and from other sensitive locations such as Aberaeron locally and due to its location between Snowdonia to the north and the Pembrokeshire Coast National Park to the south. This would make offshore wind farm development in this area visually prominent. If considered, only turbines up to 145m should be considered on the outer western edges of the area.	
VALUE- DESIGNATIONS	

Landscape designations	*Designation*	**Ceredigion Heritage Coast**
	Relevant special qualities	Special qualities are not defined.
	Notes	The Ceredigion Heritage Coast was established in 1982 and comprises four separate sections of coast, two of which are located in this area: • Monks Cave – Llanrhystud (part) • New Quay – Tresaith (part) It is generally associated with more varied hilly coastline with cliffs.
Historic	*Registered*	Upland Ceredigion inland

designations	*historic landscapes*	
	Historic parks and gardens	-
	Key scheduled monuments	Aberystwyth Castle SN 5781 (out of area to the north) Pendinas Hillfort SN 5880 (out of area to the north) Pendinaslochdyn Hillfort SN 3154
Nature conservation designations	*SPA*	-
	SAC	Cardigan Bay (part)
	Ramsar	-
LANDMAP visual and sensory value in areas with sea views		Outstanding value in Monks Cave – Llanrhystud stretch and around Aberaeron. High value for most of the coast and coastal slopes.
SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	Large
	Openness and enclosure	Open
	Coastal aspect	North west facing
	Coastal and hinterland form	Very gently curving eroding coastline at the centre of Cardigan Bay with minor headlands and bays which create some articulation to the coast. Coastal slopes running up to the coastal plateau are a characteristic of the coast.
Existing development	*Coastal settlement/ development pattern and foci*	Nucleated coastal settlements access from the coast road (A487) which is mainly set back from the coast although runs close in some locations. Aberaeron is the main settlement on the coast with sheltered traditional harbour, New Quay lies to the south with associated harbour and caravan sites and Aberarth lies to the north. A few isolated caravan sites lie between eg near Llanrhystud.
	Marine development and use	Commercial fishing, leisure fishing and sailing and sea kayaking. Generally limited marine activity.
Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	There are many tranquil locations along this primarily rural coast where access is not possible or limited to the Coast Path. Stretches include between Upper Borth and Clarach Bay, Aberystwyth to Llanyrhystud and between Aberaeron and Newquay.
	Dark skies/ Lighting	Lighting is limited to the settlements and there is none apparent offshore.
Exposure		Very exposed

Cultural associations		Cantre'r Gwaelod legend of drowned lands
VISUAL SUSCEPTIBILITY		
Distance offshore- range		Shore upto 22.6km
Size of turbines potentially having low magnitude of effect		• All turbine sizes would be likely to exceed low magnitude of effect.
Size of turbines potentially having medium magnitude of effect		• Turbines below 145m would be likely to exceed medium magnitude of effect less than14km from shore. • Turbines 145-175m would be likely to exceed medium magnitude of effect less than18.8km from shore. • Turbines above 175m would be likely to exceed medium magnitude of effect.
Visual experience	*Seascape Pattern and Foci*	There are no foci out to sea so the views along the coast to minor headlands, coves and small bays are the main interest. To the north, Snowdonia is apparent.
	Contribution to the setting of a coast or seascape character area	The sea provides a neutral setting to the coast and its features, sometimes framed by small headlands. A key feature is the sunset across the bay.
	How seascape is experienced	Coast Path for the majority of the coastline, Settlement, particularly associated with Aberaeron, New Quay and Aberarth seafronts, Coast road particularly around Aberaeron.
Key visual receptors	*In nationally designated landscapes*	-
	Outside nationally designated landscapes	Pendinaslochdyn Hillfort Wales Coast Path Aberaeron and Newquay seafronts and Aberarth
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		16: Cardigan Bay (south) (part) 17: Outer Cardigan Bay (part)
Local seascape character areas		No local study

Zone No: 10	Name: Cardigan Bay Offshore
Location	
The area is located in outer Cardigan Bay offshore from the Llŷn peninsula to the north and Strumble Head to the south.	
OVERALL SENSITIVITY	
Sensitivity	High/medium
Summary	
This zone defines the core and outer edges of Cardigan Bay. To the north lies the remote, tranquil indented rocky Llŷn peninsula, with Bardsey Island. To the north east lies the gentler sweep of embayed coastline including Tremadog Bay with the backcloth of Snowdonia. To the south lies Wales' most westerly peninsula, Pembrokeshire, with its remote exposed rocky indented coastline and Ramsey Island. To the east are the coastal cliffs and slopes of Ceredigion. The coastal landscape is sparsely settled to the west, apart from Fishguard, with a series of small coastal resorts and Aberystwyth to the north and east. There are views out into the undeveloped bay from the entire coastline including the Preseli Hills and Carningli, Snowdonia and estuaries framed by the mountains, and from the Llŷn peninsula. Depending on the time of year the views look across the zone towards the sunset. The area's susceptibility lies in the character of greater Cardigan Bay, with overlooking from three sides; the important cultural significance of Bardsey Island, the Llŷn AONB and St David's in Pembrokeshire, with their unspoilt views, remoteness, tranquillity and sense of place; the potential for prominent headlands to frame views and give scale to development; the elevated panoramic views of the bay and sense of remoteness and tranquillity in Snowdonia and the Preseli Hills; views from Harlech Castle World Heritage Site and the many scheduled monuments, historic landscapes and features overlooking the area; historic towns with framed views, such as Newport; and the potential for views of development silhouetted against the sun and by the sunset. The area's value lies in its proximity to, and overlooking by Llŷn AONB and Pembrokeshire Coast National Park (with their heritage coasts), and Snowdonia National Park.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
The area has limited if any ability to accommodate development. Larger turbines should be avoided and any development should be located in the least sensitive areas away from the Llŷn peninsula and Bardsey Island, St David's Head and out from the Pembrokeshire coast. This leaves a central location in the zone, which is also highly undesirable because of views from three sides from three national designations as well as from Ceredigion Heritage Coast.	
VALUE- DESIGNATIONS	
Landscape designations — *Designation*	**Llŷn AONB**
Relevant special qualities	• Landscape, coast and sea • A clean environment and tranquillity

	Notes	The management plan expands on the special qualities. It states that Llŷn is an area of beautiful coastal landscape that offers striking views. These include from hilltops with excellent views in every direction. The sea has greatly influenced the area's character. The peninsula, particularly at its western point, is one of the few areas where peace and tranquillity can be found with the absence of large scale development and light. The area is heritage coast on the western part of the southern coast.
	Designation	**Snowdonia National Park**
	Relevant special qualities	Diversity of high quality landscapes and coastal areas– ranging from coast rolling uplands to the rugged mountains. Areas of tranquillity and solitude.
	Notes	The mountains contribute to the coastal character providing a strong backcloth. In addition to the coast, the coastal slopes and peaks allow views out to sea from elevated locations.
	Designation	**Ceredigion Heritage Coast**
	Relevant special qualities	Special qualities are not defined.
	Notes	The Ceredigion Heritage Coast was established in 1982 and comprises four separate sections of coast, two of which are in this area: • Borth – Clarach • Monks Cave – Llanrhystud (part) It is generally associated with the dunes and coastline at Ynyslas to the north and a more varied hilly coastline with cliffs to the south.
	Designation	**Pembrokeshire Coast National Park** (including Pembrokeshire Heritage Coast)
	Relevant special qualities	Coastal splendour; islands; remoteness tranquillity and wildness; space to breathe. Opportunities for recreation leisure and learning combined with areas of tranquillity and solitude.
	Notes	The designation is focused primarily on its coast and islands and spectacular sea views whilst also covering inland hills which contribute to coastal character and also allow views of the sea.
Historic designations	*Registered historic landscapes*	Llŷn and Bardsey Island Ardudwy Aberglaslyn around Porthmadog

		Mawddach Dysynni Valley, Upland Ceredigion Newport and Carningli Preseli PenCaer: Garn Fawr and Strumble Head St David's Peninsula and Ramsey Island
	Historic parks and gardens	-
	Key scheduled monuments	Carn Fadrun Hillfort SH 2835 [inland] Criccieth Castle (also Guardianship site) SH 4937 Moel y Gest Hillfort SH 5538 Moel Goedog Hillfort SH 6132 Harlech Castle (also Guardianship and World Heritage Site) SH 5831 Tal y Garreg Hillfort SH5703 Aberystwyth Castle SN 5781 Pendinas Hillfort SN 5880 Pendinaslochdyn Hillfort SN 3154 Carn Ingli Hillfort SN 0637 Garn Fawr Hillfort SM8938 St David's Head Promontory Fort SM 7227
Nature conservation designations	*SPA*	-
	SAC	-
	Ramsar	-
LANDMAP visual and sensory value in areas with sea views		Outstanding value at the end of the Llŷn peninsula and Bardsey Island, on Snowdonia's peaks, the Mawddach estuary, Dyfi estuary and parts of upland Ceredigion, around Llanrhystud and Aberaeron, St Dogmaels Heritage Coast, Carningli and the Preseli Hills, Strumble Head, Carn Llidi, St David's Head and Ramsey Island. High value on parts of the coast on Llŷn, Snowdonia's coast facing slopes and Ceredigion's coast and coastal slopes In north Pembrokeshire, outstanding value areas with sea views include St Dogmaels Heritage Coast, Carningli and the Preseli Hills, Strumble Head, Carn Llidi, St David's Head and Ramsey Island. Much of the rest of the coast is high value, with the exception of urban settlements.
SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	Large scale open sea.
	Openness and	Very open away from the coast but perception of land

	enclosure	on three sides.
	Coastal aspect	Large curving west facing bay.
	Coastal and hinterland form	Indented rocky coasts with cliffs to the north and south, backed by plateau hinterlands (and the Preseli Hills), with smoother hinterland to the east backed either by Snowdonia mountains to the north or the Cambrian Mountains and coastal hills to the south.
Existing development	*Coastal settlement/ development pattern and foci*	Mainly rural coasts with small well-spaced settlements, the largest being Aberystwyth, Fishguard/Goodwick and Porthmadog. Settlement tends to be less to the western fringes of Llŷn and Pembrokeshire.
	Marine development and use	Commercial fishing, occasional yachting.
Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	The area is remote, wild, and tranquil open sea (exposed to south westerlies depending on weather conditions).
	Dark skies/ Lighting	The area has no light sources and is dark. The coasts particularly on western Llŷn and Pembrokeshire are predominantly dark.
Cultural associations	*Cultural associations*	Cantre'r Gwaelod legend of drowned lands may impinge on this area.
VISUAL SUSCEPTIBILITY		
Distance offshore- range		22.6km to 44km from shore
Size of turbines potentially having low magnitude of effect		• Turbines below 145m would not be likely exceed low magnitude of effect. • Turbines 145-175m would not be likely to exceed low magnitude of effect beyond 24.4km from shore. • Turbines 175-225m would not be likely to exceed low magnitude of effect beyond 28.5km from shore. • Turbines 225-300m would not be likely to exceed low magnitude of effect beyond 41.6km from shore. • Turbines 300-350m would be likely to exceed low magnitude of effect.
Size of turbines potentially having medium magnitude of effect		• Turbines below 145m would be likely to exceed medium magnitude of effect less than14km from shore. • Turbines 145-175m would be likely to exceed medium magnitude of effect less than18.8km from shore.

		• Turbines above 175m would be likely to exceed medium magnitude of effect.
Visual experience	*Seascape Pattern and Foci*	There are views across the bay from the mainland and the Llŷn peninsula to the western headlands. Snowdonia allows wide views across the bay and out to sea. In Pembrokeshire, there are wide views out to undeveloped seascapes from exposed peninsulas, framed views from bays e.g. Newport Bay and estuaries eg Teifi/Poppit Sands, views towards islands and islets eg Ramsey. There are also long views along the coast with headlands and islands as main foci. Commercial ferries are regularly visible from Strumble Head.
	Contribution to the setting of a coast or seascape character area	The bay is framed by the peninsula headlands and Snowdonia. The seascape provides an essential wild and generally unspoilt setting for the varied coastline of Llŷn and Pembrokeshire and their islands. It adds to its sense of remoteness and tranquillity. It also forms part of the special qualities of both designations.
	How seascape is experienced	From the popular Wales Coast Path, from remote and more popular beaches, from sailing/boating activities, scattered settlements eg Aberaeron, roads such as the A487. A key feature is the sunset across the bay.
Key visual receptors	*In nationally designated landscapes*	Wales Coast Path, end of the Llŷn peninsula including Braich y Pwll, and Bardsey Island/Mynydd Enlli, Aberdaron, around Trwyn Cilan, Moel-y-Gest environs, Harlech Castle, users of Snowdonia open access land, Aberdyfi seafront, Dinas Head, Strumble Head, St David's Head, Ramsey Island; coastal hills including Mynydd Carningli, the Preseli Hills, Carn Llidi; enclosed bays with focussed views out such as Newport; scheduled monuments (see above); open access land, minor road network, scattered settlement, and other areas of open access.
	Outside nationally designated landscapes	Wales Coast Path Ynyslas dunes Pendinas (Aberystwyth)
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		Offshore from: 12: Llŷn and South West Anglesey Open Waters (part) 13: Llŷn and Bardsey Island (part)

	14: Tremadog Bay and Dwyryd Estuary 15: Cardigan Bay (north) and Estuaries 16: Cardigan Bay (south) 17: Outer Cardigan Bay 18: West Pembrokeshire Coastal Waters and Islands (part) 19: West Pembrokeshire Islands, Bars and Inshore Waters (part)
Local seascape character areas Snowdonia Seascape Character Assessment to the north and Pembrokeshire Coast Seascape Character Assessment of the south	*Offshore from (to the north):* 19 Criccieth to Mochras 20 Porthmadog and Glaslyn Estuary 21 Dwyryd Estuary and Morfa Harlech 22 Mochras to Fairbourne and Sarn Badrig 23 Mawddach Estuary 24 Fairbourne to Tonfannau 25 Tywyn and Sarn-Y-Bwlch 26 Borth 27 Dyfi Estuary 33 Tremadog Bay 34 Barmouth Bay 35 Aberdyfi Bay 36 Cardigan Bay *Offshore from (to the south):* 1 Teifi Estuary 2 Cardigan Island and Cemmaes Head 3 Pen y Afwr to Pen y Bal 4 Newport Bay 5 Dinas Island 6 Fishguard Bay west 7 Fishguard and Goodwick Harbours 8 North open sea 9 Newport and Fishguard outer sand bar 10 Crincoed Point and Strumble Head 11 Strumble Head to Penbwchdy 12 Strumble Head deep water 13 Penbwchdy to Penllechwen 15 St David's Head 16 Whitesands Bay 17 Ramsey Sound 18 Ramsey Island coastal waters 19 Bishops and Clerks

Zone No: 11	Name: St George's Channel Offshore
Location	
The zone is located in the outer offshore area of St George's Channel west of Cardigan Bay.	
OVERALL SENSITIVITY	
Sensitivity	Medium
Summary	
This zone is centrally located at the outer edges of Cardigan Bay, at least 44 km offshore from the tip of the Llŷn Peninsula, and the Pembrokeshire coast. It lies further away from Snowdonia and the Ceredigion coasts. To the north lies the remote, tranquil indented rocky peninsula of Llŷn with Bardsey Island. There would be views out beyond the island from the peninsula towards this area. To the south lies Wales' most westerly peninsula, Pembrokeshire, with its remote exposed rocky indented coastline and Ramsey Island. There would be views out into the unspoilt bay from the entire coastline including the Preseli Hills and Carningli. Depending on the time of year the views look across the zone towards the sunset. The sea is open and exposed with few commercial vessels which would be unlikely to be visible from the coast. The area's susceptibility lies predominantly in combined views from the Llŷn peninsula and Pembrokeshire Coast offshore from Cardigan Bay. Development may be apparent in sunset conditions. The value associated with the zone lies in its relationship with Llŷn AONB and Pembrokeshire Coast National Park and associated Heritage Coasts. Particularly sensitive receptor locations include Bardsey Island and the tip of the Llŷn peninsula, Strumble Head, St David's Head, Ramsey Island, the Preseli Hills and Carningli.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
The zone has potential to accommodate all scales of offshore wind farm development if designed in a coherent manner but it would be desirable to minimise the height of turbines in order to minimise any effects from the highly sensitive peninsula receptors.	
VALUE- DESIGNATIONS	
Landscape designations	*Designation*	**Llŷn AONB**
	Relevant special qualities	• Landscape, coast and sea • A clean environment and tranquillity
	Notes	The management plan expands on the special qualities. It states that the Llŷn is an area of beautiful coastal landscape that offers striking views. These include from hilltops with excellent views in every direction. The sea has greatly influenced the area's character. The peninsula, particularly at its western point, is one of the few areas where peace and tranquillity can be found with the absence of large

		scale development and light. The area is heritage coast on the western part of the southern coast.
	Designation	**Snowdonia National Park**
	Relevant special qualities	Diversity of high quality landscapes and coastal areas– ranging from coast rolling uplands to the rugged mountains. Areas of tranquillity and solitude.
	Notes	The mountains contribute to the coastal character providing a strong backcloth. In addition to the coast, the coastal slopes and peaks allow views out to sea from elevated locations.
	Designation	**Ceredigion Heritage Coast**
	Relevant special qualities	Special qualities are not defined.
	Notes	The Ceredigion Heritage Coast was established in 1982 and comprises four separate sections of coast, two of which are in this area: • Borth – Clarach • Monks Cave – Llanrhystud (part) It is generally associated with the dunes and coastline at Ynyslas to the north and a more varied hilly coastline with cliffs to the south.
	Designation	**Pembrokeshire Coast National Park** (including Pembrokeshire Heritage Coast)
	Relevant special qualities	Coastal splendour; islands; remoteness tranquillity and wildness; space to breathe. Opportunities for recreation leisure and learning combined with areas of tranquillity and solitude.
	Notes	The designation is focused primarily on its coast and islands and spectacular sea views whilst also covering inland hills which contribute to coastal character and also allow views of the sea.
Historic designations	*Registered historic landscapes*	Llŷn and Bardsey Island Ardudwy Aberglaslyn around Porthmadog Mawddach Dysynni Valley, Upland Ceredigion Newport and Carningli Preseli Pen Caer: Garn Fawr and Strumble Head St David's Peninsula and Ramsey Island
	Historic parks and gardens	-

	Key scheduled monuments	Carn Fadrun Hillfort SH 2835 [inland] Criccieth Castle (also Guardianship site) SH 4937 Moel y Gest Hillfort SH 5538 Moel Goedog Hillfort SH 6132 Harlech Castle (also Guardianship and World Heritage Site) SH 5831 Tal y Garreg Hillfort SH5703 Aberystwyth Castle SN 5781 Pendinas Hillfort SN 5880 Pendinaslochdyn Hillfort SN 3154 Carn Ingli Hillfort SN 0637 Garn Fawr Hillfort SM8938 St David's Head Promontory Fort SM 7227
Nature conservation designations	*SPA*	-
	SAC	-
	Ramsar	-
LANDMAP visual and sensory value in areas with sea views		Outstanding value at the end of the Llŷn peninsula and Bardsey Island, on Snowdonia's peaks, the Mawddach and Dyfi estuaries, parts of upland Ceredigion, Llanrhystud stretch and around Aberaeron, St Dogmaels Heritage Coast, Carningli and the Preseli Hills, Strumble Head, Carn Llidi, St David's Head and Ramsey Island. High value on parts of the coast on Llŷn, Snowdonia's coast facing slopes and Ceredigion's coast and coastal slopes. In north Pembrokeshire, outstanding value areas with sea views include St Dogmaels Heritage Coast, Carningli and the Preseli Hills, Strumble Head, Carn Llidi, St David's Head and Ramsey Island. Much of the rest of the coast is high value, with the exception of urban settlements.
SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	Large scale open sea.
	Openness and enclosure	Very open away from the coast but perception of land on three sides.
	Coastal aspect	Large curving west facing bay.
	Coastal and hinterland form	Indented rocky coasts with cliffs to the north and south, backed by plateau hinterlands (and the Preseli Hills), with smoother coasts to the east backed either by Snowdonia mountains to the north or the Cambrian Mountains and coastal hills to the south.
Existing development	*Coastal*	Mainly rural coasts with small well-spaced settlements,

	settlement/ development pattern and foci	the largest being Aberystwyth, Fishguard/Goodwick and Porthmadog. Settlement tends to be less to the western fringes
	Marine development and use	Commercial fishing and other traffic
Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	The area is remote, wild, tranquil and exposed to south-westerlies depending weather conditions.
	Dark skies/ Lighting	The area has no light sources and is dark. The coasts on the western peninsulas are predominantly dark.
Exposure		Highly exposed
Cultural associations	*Cultural associations*	-
VISUAL SUSCEPTIBILITY		
Distance offshore- range		Beyond 44km from shore
Size of turbines potentially having low magnitude of effect		• All turbines below 350m are likely to have less than low magnitude of effect.
Size of turbines potentially having medium magnitude of effect		• All turbines below 350m are likely to have less than medium magnitude of effect.
Visual experience	*Seascape Pattern and Foci*	Views across this zone are at distance and mainly from the Llŷn peninsula, especially its western headlands and Bardsey Island. From Pembrokeshire there are wide views out to undeveloped seascapes from exposed peninsulas, framed views from bays e.g. Newport Bay and estuaries eg Teifi/Poppit Sands, views towards islands and islets eg Ramsey Island. There are also long views along the coast with headlands and islands as main foci. Commercial ferries into Fishguard are potentially visible..
	Contribution to the setting of a coast or seascape character area	Greater Cardigan Bay is framed by the Llŷn and Pembrokeshire peninsulas and their headlands. The seascape provides an essentially wild and undeveloped setting for the varied coastline of Llŷn and Pembrokeshire and their islands. This adds to the sense of remoteness and tranquillity, being special qualities of both designations.
	How seascape is experienced	From the popular Coast Footpath, from remote and more popular beaches, from sailing/boating activities, scattered settlements eg Aberaeron, roads such as the A487. A key feature is the sunset across the bay.
Key visual receptors	*In nationally designated landscapes*	Wales Coast Path, end of the Llŷn peninsula including Braich y Pwll, and Bardsey Island, Aberdaron, around Trwyn Cilan, Moel-y-Gest environs, Harlech Castle,

		users of Snowdonia open access land, Aberdyfi seafront, Dinas Head, Strumble Head, St David's Head, Ramsey Island; coastal hills including Mynydd Carningli, the Preseli Hills, Carn Llidi; enclosed bays with focussed views out such as Newport; scheduled monuments (see above); open access land, minor road network, scattered settlement, and other areas of open access.
	Outside nationally designated landscapes	Wales Coast Path
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		Offshore from: 12: Llŷn and South West Anglesey Open Waters (part) 13: Llŷn and Bardsey Island (part) 14: Tremadog Bay and Dwyryd Estuary 15: Cardigan Bay (north) and Estuaries 16: Cardigan Bay (south) 17: Outer Cardigan Bay 18: West Pembrokeshire Coastal Waters and Islands (part) 19: West Pembrokeshire Islands, Bars and Inshore Waters (part)
Local seascape character areas Snowdonia Seascape Character Assessment to the north and Pembrokeshire Coast Seascape Character Assessment of the south		*Offshore from (to the north):* 19 Criccieth to Mochras 20 Porthmadog and Glaslyn Estuary 21 Dwyryd Estuary and Morfa Harlech 22 Mochras to Fairbourne and Sarn Badrig 23 Mawddach Estuary 24 Fairbourne to Tonfannau 25 Tywyn and Sarn-y-Bwlch 26 Borth 27 Dyfi Estuary 33 Tremadog Bay 34 Barmouth Bay 35 Aberdyfi Bay 36 Cardigan Bay *Offshore from (to the south):* 1 Teifi Estuary 2 Cardigan Island and Cemmaes Head 3 Pen y Afwr to Pen y Bal 4 Newport Bay 5 Dinas Island 6 Fishguard Bay west

	7 Fishguard and Goodwick Harbours 8 North open sea 9 Newport and Fishguard outer sand bar 10 Crincoed Point and Strumble Head 11 Strumble Head to Penbwchdy 12 Strumble Head deep water 13 Penbwchdy to Penllechwen 15 St David's Head 16 Whitesands Bay 17 Ramsey Sound 18 Ramsey Island coastal waters 19 Bishops and Clerks

Zone No: 12	Name: Pembrokeshire coast inshore and Carmarthen Bay
Location	
The zone forms the inshore waters off the coast of Pembrokeshire running from just south of New Quay around to Worms Head on the Gower peninsula.	
OVERALL SENSITIVITY	
Sensitivity	High
Summary	
This area comprises the inshore waters of Wales' most westerly peninsula with its exposed rocky indented coastline with cliffs, headlands, beaches, bays, coves and islands such as Ramsey, Skokholm, Skomer and Caldey. This rugged, exposed coast contrasts with the broad sweep of Carmarthen Bay and Pendine Sands and the sheltered waters of Milford Haven and the estuaries of the Teifi, Taf, Tywi, Gwendraeth rivers and the Burry Inlet. The eastern extent of Carmarthen Bay is marked by Gower's Rhossili Down and beach, and the highly distinctive Worms Head. The Preseli Hills and Carningli overlook the northern coastal waters of Cardigan Bay. Settlement and development is limited with the exceptions of: Milford Haven and Pembroke Dock, which are set back from the coast; Fishguard, with its ferry port; and various coastal resorts whose main concentration is on the more sheltered south coast, notably historic Tenby, with associated leisure boating and beach use. Commercial shipping uses the harbour at Milford Haven and some ships anchor offshore at St Bride's Bay. The MOD uses the Castlemartin peninsula for practice and this occasionally disturbs the tranquillity of the coast. There are historic settlements such as Newport on the north coast, but most settlements are located inland, mainly for reasons of shelter. The area is rich in heritage features such as castles and hillforts, with a largely pastoral incised plateau hinterland. The area's susceptibility lies in the remote and unspoilt character of the sea. This is seen in juxtaposition with the highly indented rocky coastal edge which frames views across the bays, including to the islands such as Ramsey, Skokholm, Skomer and Caldey. Iconic headlands add to this, such as St David's, Strumble Head, Worms Head and Rhossili Down. Views from the Coast Path are numerous and are experienced within a context of generally undeveloped rural character, remoteness and tranquillity. There are historic towns with framed views, such as Newport, and forts and castles with commanding view such as at Llanstephan. Many locations are key visitor attractions and the area is very well used for leisure and recreation by people who wish to experience the natural beauty of the area. The area's value lies in its proximity to, and overlooking by the Pembrokeshire Coast National Park and the Gower AONB, with their respective Heritage Coasts, and the many scheduled monuments and historic features overlooking the area.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
The zone has no ability to accommodate offshore wind farms without likely significant effects on the natural beauty of Pembrokeshire Coast National Park and Gower AONB.	

VALUE- DESIGNATIONS		
Landscape designations	*Designation*	**Pembrokeshire Coast National Park** (including Pembrokeshire Heritage Coast)
	Relevant special qualities	Coastal splendour; islands; remoteness tranquillity and wildness; space to breathe. Opportunities for recreation leisure and learning combined with areas of tranquillity and solitude.
	Notes	The designation is focused primarily on its coast and islands and spectacular sea views whilst also covering inland hills which contribute to coastal character and also allow views of the sea.
	Designation	**Gower AONB**
	Relevant special qualities	The special qualities of the AONB include landscape and seascape which is defined as an important aspect of the AONB character. Many of the classic views of Gower – such as Three Cliffs Bay feature the coastline and the sea beyond. The countryside is relatively undisturbed by noise and pollution; and an absence of 'sky glow' caused by light pollution.
	Notes	Gower AONB, Britain's first, covers much of the Gower peninsula and is renowned for its scenic quality, particularly the coastline, much of which is Heritage Coast, and prominent hills such as Cefn Bryn. The coastline is also designated as Heritage Coast – recognised as one of the most outstanding stretches of undeveloped coastline in England and Wales.
	Designation	**Ceredigion Heritage Coast**
	Relevant special qualities	Special qualities are not defined.
	Notes	The Ceredigion Heritage Coast was established in 1982 and comprises four separate sections of coast, two of which is in this area: • New Quay - Tresaith • Pen-peles – Gwbert It is generally associated with more varied hilly coastline with cliffs.
Historic designations	*Registered historic landscapes*	Newport and Carningli Preseli PenCaer: Garn Fawr and Strumble Head St David's Peninsula and Ramsey Island Stackpole

		Manorbier Taf and Tywi estuary
	Historic parks and gardens	-
	Key scheduled monuments	Pendinaslochdyn Hillfort SN 3154 Carn Ingli Hillfort SN 0637 Garn Fawr Hillfort SM8938 St David's Head Promontory Fort SM 7227 Solva Head Promontory Fort SM 8023 Deer Park Promontory Fort SM 7509 Castle Head Promontory Fort SM 7905 Dale Promontory Fort SM 8205 St Govan's Chapel SM 95059 Tenby Castle SN 1300 Laugharne Castle (also Guardianship site) SN 3010 Llansteffan Castle (also Guardianship site) SN 3510
Nature conservation designations	*SPA*	Skokholm and Skomer and seas off Pembrokeshire, Castlemartin Coast, Grassholm, Ramsey and St David's Peninsula Coast, Carmarthen Bay, Burry Inlet
	SAC	Cardigan Bay (part), Pembrokeshire Marine, Carmarthen Bay and Estuaries, Limestone Coast of SW Wales cSAC: Bristol Channel Approaches
	Ramsar	Burry Inlet
LANDMAP visual and sensory value in areas with sea views		Outstanding value areas with sea views include St Dogmaels Heritage Coast, Carningli and the Preseli Hills, Strumble Head, Carn Llidi, St David's Head and Ramsey Island, Skomer, Marloes Sands, Freshwater West, St Govan's Head, Stackpole Head, Caldey Island, and the Western Gower. Much of the rest of the coast is high value, with the exception of MOD areas and urban settlements.
SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	Varies from large and open to medium and small scale in indented coastal bays and inlets.
	Openness and enclosure	Very open along the exposed coasts and headlands and in the larger bays. Enclosed in estuaries and Milford Haven.
	Coastal aspect	The aspect varies with peninsulas and bays affording views and exposure in many directions, predominantly to the north across Cardigan Bay, west and south, and also views across Carmarthen Bay to and from the Gower.
	Coastal and hinterland form	Pembrokeshire is primarily a rocky indented coastline with cliffs and headlands interspersed with wide

		beaches, bays, coves and occasional estuaries and the drowned ria of Milford Haven. Islands such as Ramsey, Skokholm, Skomer and Caldey lie offshore with islets such as the Bishops and Clerks lying further west. To the east is the broad sweep of Carmarthen Bay with its dunes and vast uninterrupted beaches such as Pendine Sands, and the estuaries of the Teifi, Taf, Tywi, Gwendraeth rivers and Burry Inlet. The west facing Rhossili Bay on Gower is backed by the large landform of Rhossili Down. Inland Pembrokeshire is generally gently undulating plateau with narrow valleys approaching the coast rising to a high point at the Preseli Hills.
Existing development	*Coastal settlement/ development pattern and foci*	The main urban centres on the coast are at Goodwick and the associated ferry port and Fishguard to the north, along the Milford Haven with associated industrial uses and its deep-water port, and Tenby, Saundersfoot and associated tourism and associated coastal development including caravan sites. Newport overlooks its bay to the north, while Kidwelly, Llanstephan and Ferryside lie in the three rivers of the Burry Inlet in Carmarthen Bay. St David's lies inland hidden from the sea. There are occasional caravan sites along the coast.
	Marine development and use	Oil tankers and other commercial traffic are present in relation to the terminals and power station in the deep-water port at Milford Haven and the ferry terminal at Goodwick. There are many leisure and recreational uses from sailing and surfing, to swimming and popular beaches.
Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	In many places the coast is relatively remote and inaccessible, especially in the stretch from Strumble Head to St Anne's Head, and wild in places such as around St David's Head and Ramsey Island. Tranquillity is high, with the exceptions of the Castlemartin Range, port areas and tourism centres.
	Dark skies/ Lighting	Generally dark, with minor foci of lighting around Cardigan, Newport and Tenby, with the focus of lighting at Fishguard and Goodwick Harbour and in Milford Haven. Lighthouses are located at Strumble Head, the Bishops and Clerks, St Anne's Head and Skokholm Island.
Exposure		The most exposed areas are those facing south west

		and west into the prevailing winds. The extremities of peninsulas are particularly exposed. Areas facing north and east and to be less exposed. Shelter lies in estuaries and the Haven.
Cultural associations	*Cultural associations*	There are associations with Gerald of Wales, J.M.W. Turner, Dylan Thomas, and historic events such as the abortive French landing of 1797, early Christian and Medieval legendary, and Viking associations and place names. Newport is an historic planted town with a Medieval charter. There are large areas of open land such as Mynydd Carningli, Mynydd Dinas, the Preselis and Garn Fawr.
VISUAL SUSCEPTIBILITY		
Distance offshore- range		Shore to 22.6 km
Size of turbines potentially having low magnitude of effect		• All turbine sizes would be likely to exceed low magnitude of effect.
Size of turbines potentially having medium magnitude of effect		• Turbines below 145m would be likely to exceed medium magnitude of effect less than14km from shore. • Turbines 145-175m would be likely to exceed medium magnitude of effect less than18.8km from shore. • Turbines above 175m would be likely to exceed medium magnitude of effect.
Visual experience	*Seascape Pattern and Foci*	There are wide views out to unspoilt seascapes from exposed peninsulas, framed views from bays e.g. Newport Bay Whitesands Bay, Marloes Sands and Rhossili and estuaries eg Teifi/Poppit Sands, views towards islands and islets eg Ramsey, the Bishops and Clerks and Skomer, across Carmarthen Bay to and from the Gower peninsula. There are also views along the coast with headlands and islands as main foci. Large commercial ships enter Milford Haven and some are seen at anchor in views across St Brides Bay along with the chimneys of the refineries at Milford Haven. Commercial ferries are regularly visible from Strumble Head. On very clear days Lundy Island is visible to the south. Near shore leisure craft are visible particularly along the south coast around Tenby.
	Contribution to the setting of a coast or seascape character	The seascape provides an essentially wild and generally undeveloped setting for the varied coastline

	area	of Pembrokeshire Coast National Park and its islands, and the western Gower AONB coastline. This adds to a sense of remoteness and tranquillity, being special qualities of both designations.
	How seascape is experienced	From the popular Wales Coast Path, from remote and more popular beaches, from sailing/boating activities, scattered settlements. A key feature is the sunset across the bay.
Key visual receptors	*In designated areas*	Wales Coast Path, headlands such as Dinas Head, Strumble Head, St David's Head, the Marloes peninsula, Worms Head; islands such as Ramsey, Skokholm, Skomer and Caldey; coastal hills including Mynydd Carningli, the Preseli Hills, Carn Llidi; enclosed bays with focussed views out such as Newport, Whitesands, Marloes Sands, Freshwater West, Broadhaven (Bosherton), Barafundle, Rhossili; scheduled monuments including St Govan's Chapel and others (see above); open access land, minor road network, scattered settlement, and other areas of open access.
	Outside designated areas	Wales Coast Path Llanstephan Castle Pendine and Pembrey Sands.
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		16: Cardigan Bay (south) (part) 17: Outer Cardigan Bay (part) 18: West Pembrokeshire Coastal Waters and Islands 19: West Pembrokeshire Islands, Bars and Inshore Waters 20: Irish Sea Offshore (part) 21: Milford Haven 22: South Pembrokeshire Coastal and Inshore Waters 23: South Pembrokeshire Open Waters (part) 24: Carmarthen Bay and Estuaries
Local seascape character areas (Pembrokeshire Coast study followed by Carmarthen Bay, Gower and Swansea Bay study)		1 Teifi Estuary 2 Cardigan Island and Cemmaes Head 3 Pen y Afwr to Pen y Bal 4 Newport Bay 5 Dinas Island 6 Fishguard Bay west 7 Fishguard and Goodwick Harbours 8 North open sea 9 Newport and Fishguard outer sand bar

	10 Crincoed Point and Strumble Head 11 Strumble Head to Penbwchdy 12 Strumble Head deep water 13 Penbwchdy to Penllechwen 15 St David's Head 16 Whitesands Bay 17 Ramsey Sound 18 Ramsey Island coastal waters 19 Bishops and Clerks 20 St Brides Bay coastal waters north 21 St Brides Bay coastal waters east 22 St Brides Bay coastal waters south- Borough Head 23 St Brides Bay south coastal waters - The Nab Head 24 St Brides Bay 25 Skomer Island and Marloes Peninsula 26 Skokholm and Gateholm coastal waters 27 Grassholm and the Smalls 28 West open sea 29 Southern inshore waters 30 Southern offshore waters 31 Outer Milford Haven 32 Inner Milford Haven 33 Daugleddau 34 Freshwater West 35 Castlemartin coastal waters 36 Stackpole coastal waters 37 Freshwater East and Manorbier 38 Lydstep Haven coastal waters 39 Tenby and Caldey Island 40 Carmarthen Bay west 41 Carmarthen Bay north- Pembrey 42 Carmarthen Bay 43 Bristol Channel offshore 44 Western offshore- very deep water *From the east:* 1 Afon Tywi, Taf and Gwendraeth estuaries 2 Carmarthen Bay- East 3 Loughor Estuary 4 Rhossili Bay

Zone No: 13	Name: Pembrokeshire coast Offshore
Location	
The zone is located offshore west of the Pembrokeshire peninsula.	
OVERALL SENSITIVITY	
Sensitivity	High/medium
Summary	
This zone lies offshore from Wales' most westerly peninsula. It includes the Smalls and associated lighthouse on its eastern edge and is an area of open, remote and wild sea fully exposed to the prevailing south westerlies. It is used for commercial fishing and as a commercial route around the treacherous waters between the Smalls and Bishops and Clerks further towards the coast. The zone forms part of the western outlook beyond the islands for the Pembrokeshire coast. This coast is exposed, rocky and indented, with cliffs, headlands, beaches, bays, coves and islands such as Ramsey, Skokholm, Skomer and Caldey. Headlands include St David's Head and Strumble Head, and there are framed views from beaches such as Whitesands Bay and Marloes Sands. Settlement and development is limited with the exceptions of Milford Haven and Pembroke Dock set back from the coast. Commercial shipping uses the harbour at Milford Haven and some ships anchor offshore at St Bride's Bay. The MOD uses the Castlemartin peninsula for practice and this occasionally disturbs the tranquillity of the coast. The area is rich in heritage features such as castles and hillforts, with a largely pastoral incised plateau hinterland. The area's susceptibility lies in the remote and unspoilt character of the sea directly west of the highly indented rocky coast. This coast frames views across the bays, beyond the islands and iconic headlands and out to zone 13 and beyond. Views are numerous from the Wales Coast Path, and are from a context of generally undeveloped rural character, to remote and tranquil seascapes. Some views west from the coast at sunset may be impacted by any development. Many locations are key visitor attractions and the area is very well used for leisure and recreation by people who wish to experience the natural beauty of the area. The area's value lies in its proximity to, and overlooking by the Pembrokeshire Coast National Park, and its Heritage Coast, and the many scheduled monuments and historic features overlooking the area, albeit at some distance from zone 13.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
The zone has very limited ability to accommodate wind turbines without likely significant effects on the natural beauty of views from the coast. That limited ability is most likely to be found in the far south of the zone if using smaller turbines as there is slightly more marine activity and coastal settlement on the south coast and this area does not interfere with views to sunsets. However, it is subject to considering the impact on Lundy Island, which is beyond the scope of this study.	

VALUE- DESIGNATIONS		
Landscape designations	*Designation*	**Pembrokeshire Coast National Park** (including Pembrokeshire Heritage Coast)
	Relevant special qualities	Coastal splendour; islands; remoteness tranquillity and wildness; space to breathe. Opportunities for recreation leisure and learning combined with areas of tranquillity and solitude.
	Notes	The designation is focused primarily on its coast and islands and spectacular sea views whilst also covering inland hills which contribute to coastal character and also allow views of the sea.
Historic designations	*Registered historic landscapes*	PenCaer: Garn Fawr and Strumble Head St David's Peninsula and Ramsey Island Stackpole
	Historic parks and gardens	-
	Key scheduled monuments	Garn Fawr Hillfort SM8938 St David's Head Promontory Fort SM 7227 Solva Head Promontory Fort SM 8023 Deer Park Promontory Fort SM 7509 Castle Head Promontory Fort SM 7905 Dale Promontory Fort SM 8205
Nature conservation designations	*SPA*	Skokholm and Skomer and seas off Pembrokeshire
	SAC	Pembrokeshire Marine
	Ramsar	-
LANDMAP visual and sensory value in areas with sea views		Outstanding value areas with sea views include Strumble Head, Carn Llidi, St David's Head and Ramsey Island, Skomer, Marloes Sands, Freshwater West, Stackpole Head, Caldey Island. Much of the rest of the coast with the exception of MOD areas are high value.
SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	Large scale open sea.
	Openness and enclosure	Very open away from the coast.
	Coastal aspect	The aspect varies with peninsulas and bays affording views and exposure in many directions but is predominantly to the west across the open sea.
	Coastal and hinterland form	Pembrokeshire is primarily a rocky indented coastline with cliffs and headlands interspersed with wide beaches, bays, coves and occasional estuaries and the drowned ria of Milford Haven. Islands such as

		Ramsey, Skokholm, Skomer and Caldey lie offshore with islets such as the Bishops and Clerks and Smalls lying further west. Inland Pembrokeshire is generally a gently undulating plateau, from which narrow valleys issue at the coast. The Preseli Hills rise to form the highest point.
Existing development	*Coastal settlement/ development pattern and foci*	The main urban centres are set back from the coast along the Milford Haven, with associated industry including the deep-water port and oil refineries. St David's lies inland hidden from the sea, and there are occasional caravan sites along the coast.
	Marine development and use	Commercial fishing and other traffic, occasional yachting.
Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	The zone is remote, wild and tranquil (and exposed depending on weather conditions).
	Dark skies/ Lighting	Apart from the Smalls lighthouse, the area has no light sources and is dark. The coast to the west is predominantly dark.
Exposure		Very exposed
Cultural associations	*Cultural associations*	Tales related to the Smalls Lighthouse.
VISUAL SUSCEPTIBILITY		
Distance offshore- range		22.6km to 44km from shore
Size of turbines potentially having low magnitude of effect		• Turbines below 145m would not be likely exceed low magnitude of effect. • Turbines 145-175m would not be likely to exceed low magnitude of effect beyond 24.4km from shore. • Turbines 175-225m would not be likely to exceed low magnitude of effect beyond 28.5km from shore. • Turbines 225-300m would not be likely to exceed low magnitude of effect beyond 41.6km from shore. • Turbines 300-350m would be likely to exceed low magnitude of effect. • However, existing windfarms may modify the likely impacts.
Size of turbines potentially having medium magnitude of effect		• Turbines below 145m would be likely to exceed medium magnitude of effect less than14km from shore. • Turbines 145-175m would be likely to exceed medium magnitude of effect less than18.8km

		from shore. • Turbines above 175m would be likely to exceed medium magnitude of effect. • However, existing windfarms may modify the likely impacts.
Visual experience	*Seascape Pattern and Foci*	There are wide views out to unspoilt seascapes from exposed peninsulas, framed views from bays e.g. Whitesands Bay, Marloes Sands, views towards islands and islets eg Ramsey, the Bishops and Clerks and Smalls, and Skomer. There are also long views along the coast with headlands and islands as main foci. Large commercial ships enter Milford Haven and some are seen at anchor in views across St Brides Bay along with the chimneys of the refineries at Milford Haven to the south. Commercial ferries are regularly visible from Strumble Head. On very clear days Lundy Island is visible to the south.
	Contribution to the setting of a coast or seascape character area	The seascape provides an essential wild and generally unspoilt setting for the varied coastline of Pembrokeshire and its islands. It adds to its sense of remoteness and tranquillity. It also forms part of the special qualities of the designation.
	How seascape is experienced	From the popular Wales Coast Path, from remote and more popular beaches, from sailing/boating activities, scattered settlements. A key feature is the sunset across the sea.
Key visual receptors	*In designated areas*	Wales Coast Path, headlands such as Strumble Head, St David's Head, the Marloes peninsula; islands such as Ramsey, Skokholm, Skomer, Caldey; coastal hills including Carn Llidi; enclosed bays with focussed views out such as Whitesands, Marloes Sands, Freshwater West; scheduled monuments (see above); open access land, minor road network, scattered settlement, and other areas of open access.
	Outside designated areas	-
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		Offshore from: 18: West Pembrokeshire Coastal Waters and Islands 19: West Pembrokeshire Islands, Bars and Inshore Waters 20: Irish Sea Offshore (part) 21: Milford Haven 22: South Pembrokeshire Coastal and Inshore Waters

	23: South Pembrokeshire Open Waters (part) 24: Carmarthen Bay and Estuaries 25: Gower and Helwick Coastal Waters (part)
Local seascape character areas (Pembrokeshire Coast study)	30 Southern offshore waters (part) 44 Western offshore- very deep water Offshore from: 11 Strumble Head to Penbwchdy 12 Strumble Head deep water 13 Penbwchdy to Penllechwen 15 St David's Head 16 Whitesands Bay 17 Ramsey Sound 18 Ramsey Island coastal waters 19 Bishops and Clerks 20 St Brides Bay coastal waters north 21 St Brides Bay coastal waters east 22 St Brides Bay coastal waters south- Borough Head 23 St Brides Bay south coastal waters - The Nab Head 24 St Brides Bay 25 Skomer Island and Marloes Peninsula 26 Skokholm and Gateholm coastal waters 27 Grassholm and the Smalls 28 West open sea 29 Southern inshore waters 30 Southern offshore waters 31 Outer Milford Haven 32 Inner Milford Haven 33 Daugleddau 34 Freshwater West 35 Castlemartin coastal waters

Zone No: 14	Name: Celtic Sea
Location	
The zone is located offshore south west of the Pembrokeshire peninsula in the Celtic Sea.	
OVERALL SENSITIVITY	
Sensitivity	Medium/low
Summary	
This zone lies offshore from Wales' most westerly peninsula. It is an area of open, remote and wild sea fully exposed to the prevailing south westerlies. It is used for commercial fishing and some commercial traffic access Milford Haven and other ports. The zone forms part of the western outlook beyond the islands for the Pembrokeshire coast. The coastline, albeit at some distance away, is exposed, rocky and indented, with cliffs, headlands, beaches, bays, coves and islands such as Ramsey, Skokholm Skomer and Caldey. Headlands include St David's Head and Strumble Head, and there are framed views from beaches such as Whitesands Bay and Marloes Sands. Settlement and development is limited with the exceptions of Milford Haven and Pembroke Dock set back from the coast. Commercial shipping uses the harbour at Milford Haven and some ships anchor offshore at St Bride's Bay. The MOD uses the Castlemartin peninsula for practice and this occasionally disturbs the tranquillity of the coast. The area is rich in heritage features such as castles and hillforts, with a largely pastoral incised plateau hinterland. The susceptibility of the zone lies in its remote and unspoilt character. The zone forms a distant seaward setting for views from the coast. The highly indented rocky coast has views across the bays, beyond the islands such as Ramsey, Skokholm, Skomer and Caldey and out to sea. These include views from iconic headlands such as St David's, Strumble Head, the views from the Wales Coast Path. These views form a backdrop to the coast's generally undeveloped rural character, remoteness and tranquillity. Some views at sunset may be impacted by development in the north of the zone. Many coastal locations are key visitor attractions and the area is very well used for leisure and recreation by people who wish to experience the natural beauty of the area. The area's value lies in its relationship to, and overlooking by the Pembrokeshire Coast National Park, and its Heritage Coast, and the many scheduled monuments and historic features overlooking the area. However, the level of impact from development in the zone would be moderated by the substantial distance from coastal receptors.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
The zone has potential to accommodate all scales of offshore wind farm development if designed in a coherent manner but it would be desirable to avoid development in the northern corner to avoid development off St David's Head and minimise the height of turbines on the eastern fringes of the area in order to minimise any effects on the highly sensitive peninsula receptors.	

VALUE- DESIGNATIONS		
Landscape designations	*Designation*	**Pembrokeshire Coast National Park** (including Pembrokeshire Heritage Coast)
	Relevant special qualities	Coastal splendour; islands; remoteness tranquillity and wildness; space to breathe. Opportunities for recreation leisure and learning combined with areas of tranquillity and solitude.
	Notes	The designation is focused primarily on its coast and islands and spectacular sea views whilst also covering inland hills which contribute to coastal character and also allow views of the sea.
Historic designations	*Registered historic landscapes*	PenCaer: Garn Fawr and Strumble Head St David's Peninsula and Ramsey Island Stackpole
	Historic parks and gardens	-
	Key scheduled monuments	Garn Fawr Hillfort SM8938 St David's Head Promontory Fort SM 7227 Solva Head Promontory Fort SM 8023 Deer Park Promontory Fort SM 7509 Castle Head Promontory Fort SM 7905 Dale Promontory Fort SM 8205
Nature conservation designations	*SPA*	Skokholm and Skomer and seas off Pembrokeshire
	SAC	Pembrokeshire Marine
	Ramsar	-
LANDMAP visual and sensory value in areas with sea views		Outstanding value areas with sea views include Strumble Head, Carn Llidi, St David's Head and Ramsey Island, Skomer, Marloes Sands, Freshwater West, Stackpole Head, Caldey Island. Much of the rest of the coast with the exception of MOD areas are high value.
SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	Large scale open sea.
	Openness and enclosure	Very open away from the coast.
	Coastal aspect	The aspect varies with peninsulas and bays affording views and exposure in many directions but is predominantly to the west across the open sea.
	Coastal and hinterland form	Pembrokeshire is primarily a rocky indented coastline with cliffs and headlands interspersed with wide beaches, bays, coves and occasional estuaries and the drowned ria of Milford Haven. Islands such as

		Ramsey, Skokholm, Skomer and Caldey lie offshore with islets such as the Bishops and Clerks and Smalls lying further west. Inland Pembrokeshire is generally gently undulating plateau from which narrow valleys approach the coast, and from which the higher land of the Preseli Hills rise.
Existing development	*Coastal settlement/ development pattern and foci*	The main urban centres are set back from the coast along the Milford Haven, with associated industrial uses including a deep-water port and oil refineries. St David's lies inland hidden from the sea, and there are occasional caravan sites along the coast.
	Marine development and use	Commercial fishing and other traffic.
Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	The zone is remote, wild and tranquil (and very exposed to south-westerlies depending on weather conditions).
	Dark skies/ Lighting	The area has no light sources and is dark. The coast to the west is predominantly dark.
Exposure		Very exposed
Cultural associations	*Cultural associations*	-
VISUAL SUSCEPTIBILITY		
Distance offshore- range		Beyond 44km from shore
Size of turbines potentially having low magnitude of effect		• All turbines below 350m are likely to have less than low magnitude of effect.
Size of turbines potentially having medium magnitude of effect		• All turbines below 350m are likely to have less than medium magnitude of effect.
Visual experience	*Seascape Pattern and Foci*	There are views at a distance out to this undeveloped seascape from exposed peninsulas, framed views from bays e.g. Whitesands Bay, Marloes Sands, views towards islands and islets eg Ramsey, the Bishops and Clerks and Smalls, and Skomer. There are also long views along the coast with headlands and islands as main foci. Large commercial ships enter Milford Haven and some are seen at anchor in views across St Brides Bay along with the chimneys of the refineries at Milford Haven. Commercial ferries are regularly visible from Strumble Head. On very clear days Lundy Island is visible to the south.
	Contribution to the setting of a coast or seascape character area	The seascape provides an essential wild and generally unspoilt setting for the varied coastline of Pembrokeshire and its islands. It adds to its sense of

		remoteness and tranquillity. Its nearer waters form part of the special qualities of the designation.
	How seascape is experienced	From the popular Coast Footpath, from remote and more popular beaches, from sailing/boating activities, scattered settlements. A key feature is the sunset across the sea.
Key visual receptors	*In designated areas*	Wales Coast Path, headlands such as Strumble Head, St David's Head, the Marloes peninsula; islands such as Ramsey Island, Skomer, Caldey Island; coastal hills including Carn Llidi; enclosed bays with focussed views out such as Whitesands, Marloes Sands, Freshwater West; scheduled monuments (see above); open access land, minor road network, scattered settlement, and other areas of open access.
	Outside designated areas	-
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		Offshore from: 18: West Pembrokeshire Coastal Waters and Islands 19: West Pembrokeshire Islands, Bars and Inshore Waters 20: Irish Sea Offshore (part) 21: Milford Haven 22: South Pembrokeshire Coastal and Inshore Waters 23: South Pembrokeshire Open Waters (part) 24: Carmarthen Bay and Estuaries 25: Gower and Helwick Coastal Waters (part)
Local seascape character areas (Pembrokeshire Coast study)		Offshore from: 11 Strumble Head to Penbwchdy 12 Strumble Head deep water 13 Penbwchdy to Penllechwen 15 St David's Head 16 Whitesands Bay 17 Ramsey Sound 18 Ramsey Island coastal waters 19 Bishops and Clerks 20 St Brides Bay coastal waters north 21 St Brides Bay coastal waters east 22 St Brides Bay coastal waters south- Borough Head 23 St Brides Bay south coastal waters - The Nab Head 24 St Brides Bay 25 Skomer Island and Marloes Peninsula 26 Skokholm and Gateholm coastal waters 27 Grassholm and the Smalls

	28 West open sea 29 Southern inshore waters 30 Southern offshore waters 31 Outer Milford Haven 32 Inner Milford Haven 33 Daugleddau 34 Freshwater West 35 Castlemartin coastal waters 44 Western offshore- very deep water

Zone No: 15	Name: Bristol Channel and Severn Estuary
Location	
The zone is located from Worms Head on Gower, eastwards to Goldcliff in the Severn Estuary.	
OVERALL SENSITIVITY	
Sensitivity	High
Summary	
The area is the northern part of a channel and estuary bounded by a diverse Welsh south-facing coast. This comprises of the rocky cliffs, headlands, sandy bays and coves of Gower to the west, the elegant sweep of Swansea Bay from the Mumbles to the industrial area of Port Talbot, the extensive dunes at Kenfig and Merthyr Mawr, the wave cut platforms and beaches of Glamorgan Heritage coast with cliff -top walks and incised valleys, and east past Penarth Head and Cardiff Bay, the flat Gwent Levels and exposed mud of the upper estuary. The channel and estuary is used by commercial shipping serving Avonmouth primarily, with some boats also serving Port Talbot docks and also Cardiff and Swansea. Leisure boating operates primarily out of Swansea and Cardiff/Penarth and leisure fishing is particularly popular along the south coast of the Gower. The English coast is generally less populated, particularly to the west, the massif of Exmoor creating a rugged backcloth to the seascape. The area's susceptibility lies in the location of this area between the coasts of England and Wales, with superb views across the water to the other coasts. For instance, Exmoor provides the backcloth to the Severn estuary in views from the distinctive lias Vale of Glamorgan Coast. The susceptibility also lies in the varied coastline of Gower with its. rocky cliffs, headlands, arches, coves and beaches which offer a combination of elevated and framed views and views to the islands of Flatholm and Steepholm in the eastern part of the zone. The Wales Coast Path runs along the majority of the coastline with the exception of Port Talbot. Three major cities lie on the coast- Cardiff, Swansea and Newport, along with towns at Porthcawl, Barry and Penarth. Structures at Port Talbot steelworks, Aberthaw power station, Uskmouth power station and the two Severn bridges along with some scattered wind turbines punctuate the coast. However, the urban character in places mean that many people enjoy views out to sea from promenades at Swansea, Porthcawl, Penarth and Cardiff Bay barrage. The area's value lies primarily in the proximity and overlooking by Gower AONB and the Glamorgan Heritage coast in Wales and the Exmoor National Park and the North Devon Coast and Quantock Hills AONBs in England.	
RECOMMENDATIONS FOR OFFSHORE WIND FARMS IN TERMS OF SEASCAPE AND VISUAL FACTORS	
Summary	
The area has no ability to accommodate offshore wind farms without likely significant effects on the natural beauty of views experienced from a number of Designated Landscapes.	

VALUE- DESIGNATIONS		
	Designation	**Gower AONB**
	Relevant special qualities	The special qualities of the AONB include landscape and seascape which is defined as an important aspect of the AONB character. Many of the classic views of Gower – such as Three Cliffs Bay feature the coastline and the sea beyond. The countryside is relatively undisturbed by noise and pollution; and an absence of 'sky glow' caused by light pollution.
	Notes	The Gower AONB, Britain's first, covers much of the peninsula and is renowned for its scenic quality, particularly the coastline, much of which is Heritage Coast, and prominent hills such as Cefn Bryn. The coastline is also designated as Heritage Coast – recognised as one of the most outstanding stretches of undeveloped coastline in England and Wales.
Landscape designations	*Designation*	**Glamorgan Heritage Coast**
	Relevant special qualities	An eroding south and south west facing coastline of imposing cliffs, wave cut platforms and beaches with reefs of significant nature conservation interest.
	Notes	Key views from the Wales Coast Path and recreation areas including Ogmore by Sea. Long open scenic views of the Bristol Channel are seen against the strong backcloth of the English coast including Exmoor. Scenic views are also possible along the coast with the open rural backcloth of the plateau inland. The highly distinctive strata of the limestone cliffs and rock platforms set this coast apart from others and its value for recreation and enjoyment is reinforced by its proximity to large centres of population such as Cardiff.
	Designation	**Exmoor National Park** *(in England)*
	Relevant special qualities	Large areas of open moorland providing a sense of remoteness and tranquillity rare in southern Britain. Spectacular coast with high sea cliffs. A timeless landscape mostly free from intrusive development, with striking views inside and out of the National Park, where the natural beauty of Exmoor and its dark skies can be appreciated.
	Notes	The area not only allows views from its spectacular

		coast but also from substantial elevated areas inland. These also act as a scenic backcloth in views across the Bristol Channel from the Welsh Coast. The National Park is the main designation on the English coast but there are also the North Devon Coast, Quantocks and Mendips AONBs which have views across the English waters towards Wales, and which need to be taken into account.
Historic designations	*Registered historic landscapes*	Gower Margam Abbey and Mountain Merthyr Mawr, Kenfig and Margam Burrows Gwent Levels
	Historic parks and gardens	Parc-le-Breos and Penrice Castle Dunraven Park The Knap and St Donats Alexandra Park and Windsor Gardens in Penarth
	Key scheduled monuments	The Knave Hillfort, 301326 Paviland Camp 301339 Goat's Hole Cave, Paviland 300251 Mynydd y Castell Hillfort SS 8086 Dunraven Hillfort SS 8872 Summerhouse Hillfort SS 9966 The Bulwarks Hillfort ST 0866
Nature conservation designations	*SPA*	Severn Estuary
	SAC	Kenfig, Dunraven Bay
	Ramsar	Severn Estuary
LANDMAP visual and sensory value in areas with sea views		Outstanding areas with sea views include Worms Head, Rhossili Bay and Down, Oxwich Bay, Three Cliffs Bay, Mumbles Hill, and the Glamorgan Heritage Coast. The rest of the southern Gower Coast is evaluated as high.
SEASCAPE SUSCEPTIBILITY		
Coastal geometry and landform	*Scale*	Generally medium to large scale due to the cliffs, simplicity and grand sweep of the Swansea Bay. On Gower scale is small in places due to the indented nature of the coast.
	Openness and enclosure	A mix of open and medium enclosed depending on aspect. Open but views south across the Bristol Channel and Severn Estuary to England provide a more enclosed seascape and views west.
	Coastal aspect	Mostly south and south-west including from the Gower and Glamorgan Heritage Coast but there are limited easterly views in Swansea Bay and around Penarth.
	Coastal and	The Gower coastline is a mix of rocky indented coast

	hinterland form	with cliffs and wave cut platforms and intervening sweeping sandy bays such as Port Eynon and Oxwich/Three Cliffs Bay. Inland there are hills, most notably Rhossili Down to the west and Cefn Bryn, both of which are visible from long distances. Swansea Bay is a broad sweeping sandy bay enclosed by Mumbles Head to the west and the edge of the South Wales Plateau to the north and east. The low-lying coastal plain and dunes at Kenfig and Merthyr Mawr to the east give way to the slightly concave Glamorgan coast with its distinctive high lias cliffs, wave cut platforms and beaches. This is backed by a gently undulating plateau hinterland. To the east is the relatively straight coastline of the coastal levels with coastal bund running from Cardiff and Newport to Chepstow.
Existing development	*Coastal settlement/ development pattern and foci*	The Gower has a few coastal settlements with associated tourism facilities, increasing in size and density to the east. East of the Gower, Swansea dominates Swansea Bay and its promenade and a corniche stretches from Mumbles Head to the Tawe and its marina. The Tata Steelworks at Port Talbot forms the major feature on the eastern edge of the bay with its large structures and occasional emissions of steam. Porthcawl with its promenade and caravan parks, Ogmore, Aberthaw power station and Barry with its leisure uses and docks interrupt the largely unsettled coastline to the east. Penarth, with its pier, lies at the termination of the lias cliff coast. The Cardiff Bay barrage allows views across the Severn estuary. The conurbation of Cardiff and Newport lie back from the coast on the coastal plain and levels. Large electricity pylons extend from the Uskmouth Power Station and there are some onshore turbines around the levels. The two Severn bridges, for the M4 and M48 motorways mark the eastern termination of the area.
	Marine development and use	Commercial navigation along the Bristol Channel/Severn Estuary to/from Avonmouth predominantly, but also out of Swansea, Port Talbot and Cardiff. Leisure boating operates primarily out of Swansea, Oystermouth/Mumbles and Cardiff/Penarth and leisure fishing is particularly popular along the south coast of the Gower. Swimming and other leisure marine use from beaches mainly in Gower and Porthcawl.

Remoteness, Tranquillity, Wildness	*Remoteness, Tranquillity, Wildness*	Few parts of the coast are very tranquil due to the popularity of the area but some areas are relatively remote such as western stretch between Mewslade Bay and Port Eynon. Parts of the Glamorgan Heritage Coast and Kenfig Sands afford tranquillity.
	Dark skies/ Lighting	Major concentrations of lighting are in Swansea Bay, the steelworks, Penarth, Cardiff and Newport. Other sources include Porthcawl, Trecco Bay, Barry, Ogmore by Sea, Aberthaw power station and the airports. The Mumbles, Nash Point and Flatholm have lighthouses.
Exposure		The area varies from very exposed at Worms Head, to moderately exposed in clifftop areas and beaches open to the south westerlies, but with sheltered coves and bays, and moderately exposed further east along the sea wall to the Gwent Levels.
Cultural associations	*Cultural associations*	Paleolandscapes of the Bristol Channel and Severn estuary; Swansea – docks and ship building (in the past). Swansea Bay, Mumbles and Porthcawl and Barry holiday resorts. Lavernock Point and Flatholm island are historically significant for the transmission of the first wireless telegraphy. Cardiff - city and capital of Wales, former coal port, home of National Assembly for Wales, Senedd, and the Millennium Centre. Sustrans Celtic Trail cycle path.
VISUAL SUSCEPTIBILITY		
Distance offshore- range		Shore to 22.6 km
Size of turbines potentially having low magnitude of effect		• All turbine sizes would be likely to exceed low magnitude of effect.
Size of turbines potentially having medium magnitude of effect		• Turbines below 145m would be likely to exceed medium magnitude of effect less than14km from shore. • Turbines 145-175m would be likely to exceed medium magnitude of effect less than18.8km from shore. • Turbines above 175m would be likely to exceed medium magnitude of effect.
Visual experience	*Seascape Pattern and Foci*	One of the main characteristics of this seascape is the view between the Welsh and English Coasts, most notably to Exmoor but also the North Devon Coast, which act as strong positive backcloths to views, especially from the Vale of Glamorgan Heritage Coast. There are wide views out to unspoilt seascapes from exposed peninsulas such as Worms Head, from clifftop

		walks such as east of Port Eynon and the Glamorgan Coast, framed views from bays e.g.Three Cliffs Bay. There are also long views along the coast with headlands as main foci eg Oxwich Point, Worms Head, the Mumbles, Trwyn-y-Witch, Monknash and Nash Point. Views to Flatholm and Steepholm are also distinctive. On very clear days Lundy Island is visible to the south. Large commercial ships are visible, mainly approaching Avonmouth on the English side of the channel but also occasionally locally to the Welsh ports. Near shore leisure craft are visible particularly along the south coast of Gower.
	Contribution to the setting of a coast or seascape character area	The seascape provides an essential wild and generally unspoilt setting for the varied coastline of the Bristol Channel and Severn Estuary, especially the western Gower and Glamorgan Heritage Coast coastlines. Exmoor and the English coast acting as the backcloth to the view is a particularly valuable characteristic of the setting further east. The seascape adds to its sense of remoteness and tranquillity. It also forms part of the special qualities of the Gower AONB.
	How seascape is experienced	From the popular Coast Footpath, from remote and more popular beaches, yachts, pleasure boats and settlements.
Key visual receptors	*In designated areas*	Wales Coast Path, popular beaches such as at Oxwich, Port Eynon and Three Cliffs Bay, coastal settlements such as Langland Bay and Caswell.
	Outside designated areas	Wales Coast Path and low-key recreation and accesses at Southerndown, Nash Point, Ogmore, and Cwm Colhuw; promenades at Swansea, Aberavon, Porthcawl and Penarth; Cardiff Bay barrage; Mumbles and Penarth Piers; corniche at Swansea; housing in all coastal settlements.
SEASCAPE CHARACTER CONTEXT		
National Marine Character Areas		25: Gower and Helwick Coastal Waters (part) 26: Swansea Bay and Porthcawl 27: Glamorgan Coastal Waters and Nash Sands 28: Bristol Channel (Wales) 29: Severn Estuary (Wales)
Local seascape character areas (Carmarthen Bay, Gower and Swansea Bay study)		5 Worms Head to Port Eynon Point 6 Oxwich and Port Eynon Bays 7 Pwlldu Head to Mumbles Head 8 Swansea Bay- west

	9 Swansea Bay- east 10 Neath estuary 11 Margam to Porthcawl 12 Porthcawl 13 Nash sand bar 14 Bristol Channel- south east 15 Bristol Channel- east 16 Mid Swansea Bay 17 Outer Swansea Bay 18 Offshore Oxwich Point to Mumbles Head 19 Bristol Channel- offshore 20 Bristol Channel - south west offshore

6. References

- Countryside Agency. 2002. Topic Paper 6: Techniques and criteria for judging capacity and sensitivity.
- Countryside Council for Wales. Briggs and White. 2009. Sensitivity of Welsh seascapes to offshore renewable energy developments. (Countryside Council for Wales Policy Research Report number 08/5).
- DTI. 2005. Guidance on the Assessment of the Impact of Offshore Windfarms: seascape and visual impact report.
- LI and IEMA. 2013. Guidelines for Landscape and Visual Impact Assessment. Edition 3, (GLVIA 3).
- Natural England. 2012. An approach to seascape character assessment. NECR 105.
- Natural Resources Wales. May and August 2018. Landscape Sensitivity and Capacity Assessment: Guidance for Wales and associated Annex 1- Draft for consultation.
- UK Offshore Energy Strategic Environmental Assessment 2. DECC. March 2011.
- UK Offshore Energy Strategic Environmental Assessment 3. DECC. March 2016.

Data Archive Appendix

Data outputs associated with this project are archived in [NRW to enter relevant corporate store and / or reference numbers] on server–based storage at Natural Resources Wales.

The data archive contains:

[A] The final report in Microsoft Word and Adobe PDF formats.

[B] A full set of maps produced in JPEG format.

[C] A series of GIS layers on which the maps in the report are based with a series of word documents detailing the data processing and structure of the GIS layers

[F] A full set of images produced in [jpg/tiff] format.

Metadata for this project is publicly accessible through Natural Resources Wales' Library Catalogue https://libcat.naturalresources.wales (English Version) and https://catllyfr.cyfoethnaturiol.cymru (Welsh Version) by searching 'Dataset Titles'. The metadata is held as record no [NRW to insert this number]

DO NOT DELETE THE SECTION BREAK BELOW

Published by:
Natural Resources Wales
Address line one
Address line two
Address line three
Post Code

0000 000 000

Further copies of this report are available from:

Email: library@cyfoethnaturiolcymru.gov.uk