Spiorad na Mara Offshore Wind Farm

Offshore Project

Environmental Impact Assessment Report

Annex 10.1.1: Water Framework Directive Water Body Data, Volume 2c

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1 ANNEX 10.1.1 WATER FRAMEWORK DIRECTIVE WATER BODY DATA

1.1.1.1 This annex is intended to support the **Appendix 10.1: Water Framework Directive, Volume 2c**.

1.2 BASELINE CHARACTERISTICS – WFD QUALITY ELEMENTS

1.2.1.1 **Table 1-1** - **Table 1-4** provide an overview of the WFD status of the coastal and groundwater bodies that the Offshore Project directly intersects (see **Table 4-1** of **Appendix 10.1, Volume 2c**) based on data from SEPA's Water Classification Hub. Information for all inland waterbodies is also available from the same source.

Table 1-1 Summary of the WFD status of the Gallan Head/*Àird Uig* to the Butt of Lewis/*Rubha Robhanais* water body (ID: 200476). Data recorded for 2023 unless stated otherwise.

Gallan Head/*Àird Uig* to the Butt of Lewis/*Rubha Robhanais* (ID 200476)	**Status**
Water body type	Coastal
River basin district/catchment	Scotland/*Alba*
Water body area	402.6 km^2
Artificial	No
Heavily modified	No
Overall ecological status / potential	High
Current overall status / potential	High
Status objective (overall)*	High
Chemical status	Not assessed
Priority substances	Not assessed
Higher sensitivity habitats present	Subtidal kelp Maerl or coarse shell gravel with burrowing sea cucumbers Native oysters
Lower sensitivity habitats present	None
Protected area designation	N/A
Biological quality elements	
Overall biological quality	High
Invertebrate animals	Not assessed
Benthic invertebrates	Not assessed
Macroalgae	High
Phytoplankton	High
Physico-chemical quality elements	
Dissolved oxygen	Not assessed
Dissolved inorganic nitrogen	Not assessed

Gallan Head/*Àird Uig* to the Butt of Lewis/*Rubha Robhanais* (ID 200476)	**Status**
Water quality status	High
Water quality objective*	High
Specific pollutants	Not assessed
Unionised ammonia	Not assessed
Hydromorphological quality elements	
Hydromorphology	High
Morphology	High

Table 1-2: Summary of the WFD status of the Loch Roag/*Loch Ròg* water body (ID: 200205). Data recorded for 2023 unless stated otherwise.

Loch Roag/*Loch Ròg* (ID 200205)	**Status**
Water body type	Coastal
River basin district/catchment	Scotland/*Alba*
Water body area	75.1 km^2
Artificial	No
Heavily modified	No
Overall ecological status/potential	Good/High
Current overall status/potential	Good/High
Status objective (overall)*	High
Chemical status	Pass
Priority substances	Pass
Higher sensitivity habitats present	Subtidal seagrass Subtidal kelp beds Mussel beds Native oysters Blue mussels Inshore deep mud with burrowing heart urchins 'Reefs' Saltmarsh
Lower sensitivity habitats present	Intertidal mudflats Low or variable salinity habitats Tide swept algal communities Sea lock egg wrack beds Mudflats and sandflats not covered by seawater at low tide
Protected area designation	Loch Roag/*Loch Ròg* Shellfish Water Protected Area (ID: SWPA52)
Biological quality elements	
Overall biological quality	Good
Invertebrate animals	Good
Benthic invertebrates	Good

Loch Roag/*Loch Ròg* (ID 200205)	Status
Macroalgae	High
Phytoplankton	High
Physico-chemical quality elements	
Dissolved oxygen	High
Dissolved inorganic nitrogen	Good
Water quality status	Good
Water quality objective*	High
Specific pollutants	Pass
Copper	Pass
Zinc	Pass
Unionised ammonia	Pass
Hydromorphological quality elements	
Hydromorphology	High
Morphology	High

Table 1-3: Summary of the WFD status of the Loch Carloway water body (ID: 200204). Data recorded for 2023 unless stated otherwise.

Loch Carloway water body (ID: 200204). (ID 200204)	Status
Water body type	Loch
River basin district/catchment	Scotland/*Alba*
Water body area	1.2 km^2
Artificial	No
Heavily modified	No
Overall ecological status/potential	Good
Current overall status/potential	Good
Status objective (overall)*	Good
Chemical status	Pass
Priority substances	Pass
Higher sensitivity habitats present	Macrophyte-dominated littoral zones Oligotrophic and dystrophic loch habitats Peatland-fringe and wetland margins Freshwater pearl mussel habitat (if present in inflows/outflows) Spawning grounds for salmonids (trout/salmon) Charophyte beds
Lower sensitivity habitats present	Open water pelagic zone Sandy or silty littoral zones without macrophyte cover Common reed beds (*Phragmites australis*) General benthic invertebrate habitats in deeper sediments

Loch Carloway water body (ID: 200204). (ID 200204)	Status
	Areas dominated by filamentous algae
Protected area designation	N/A
Biological quality elements	
Overall biological quality	Good
Invertebrate animals	Good
Benthic invertebrates	Good
Macroalgae	High
Phytoplankton	High
Physico-chemical quality elements	
Dissolved oxygen	High
Dissolved inorganic nitrogen	Good
Water quality status	Good
Water quality objective*	High
Specific pollutants	Pass
Unionised ammonia	Pass
Hydromorphological quality elements	
Hydromorphology	High
Morphology	High

Table 1-4: Summary of the WFD status of the Lewis and Harris groundwater body (ID: 150695). Data recorded for 2023 unless stated otherwise.

Lewis and Harris groundwater body (ID: 150695	Status
Water body type	Groundwater
River basin district/catchment	Scotland/A*lba*
Water body area	2,108.9 km^2
Overall status	Good
Quantitative Status	
Overall status	Good
Saline intrusion	Good
SW Interaction	Good
Water balance	Good
Chemical Status	
Saline intrusion	Good
SW Interaction (SWI)	Good
Diffuse impacts	Good
Point source impacts	Good
SWI – Specific pollutants	Good
SWI Cadmium	Good
SWI Lead	Good
Drinking Water Protected Areas (DWPA)	Good
DWPA _ Priority Substances	Good

Lewis and Harris groundwater body (ID: 150695	Status
DWPA - Atrazine	Good
DWPA - Simazine	Good
DWPA – Other Substances	Good
DWPA - Epoxyconazole	Good
DWPA - Nitrate	Good
Chemical – General tests (CGT)	Good
CGT – Priority substances	Good
CGT - Atrazine	Good
CGT - Simazine	Good
CGT - Trichloroethene	Good
CGT - Benzene	Good
CGT – Specific pollutants	Good
CGT - Chromium	Good
CGT – Other substances	Good
CGT – Electrical Conductivity	Good
CGT - Epoxyconazole	Good
CGT - Nitrate	Good
CGT – Free Product	Good
CGT – Vinyl Chloride	Good
Water Quality Status	Good

1.2.1.2 Under the WFD, surface water bodies are assessed using a set of quality elements that indicate their ecological condition. These elements (described below) provide a consistent framework for determining whether a water body is at risk of deterioration or failing to achieve its environmental objectives.

1.2.2 HYDROMORPHOLOGY QUALITY ELEMENTS FOR SURFACE WATER BODIES.

1.2.2.1 The hydromorphology quality elements for the Gallan Head/*Àird Uig* to the Butt of Lewis/*Rubha Robhanais*, and Loch Roag/*Loch Ròg* water bodies are currently both assessed as High. Activities where the footprint of the activity exceeds the criteria listed in paragraph 4.2.1.5 of **Appendix 10.1, Volume 2c** may have potential to cause changes in the quality elements described below.

1.2.3 TIDAL REGIME

1.2.3.1 Tides in the Outer Hebrides/*Na h-Eileanan Siar* are dominated by 2 semidiurnal constituents: the M1 and the S2 constituents. Both constituents follow the same distribution, either the S2 constituent having a tidal amplitude of 40% that of the M2 constituent, which falls between 1.1–1.2 m throughout the Array Area (Inall and Sherwin, 2006).

1.2.3.2 Standard astronomical tide levels were obtained from the UK Hydrographic Office (UKHO) Admiralty Total Tide (ATT) software. Levels for the nearest reference point (Carloway) were extracted. Carloway/*Càrlabhagh* is a Secondary Non-Harmonic port approximately 15 km from the centre of the Array Area and 20 km southwest of the OCAS. The tide type is Semi-Diurnal, with typical levels summarised in **Table 1-5**.

Table 1-5 Carloway standard tidal levels

Tide Level	Acronym	Chart Datum	mOD
Highest Astronomical Tide	HAT	4.7 m	2.5 m
Mean High Water Springs	MHWS	4.1 m	1.9 m
Mean High Water Neaps	MHWN	3.2 m	1.0 m
Mean Sea Level	MSL	2.43 m	0.23 m
Mean Low Water Neaps	MLWN	1.7 m	-0.5 m
Mean Low Water Springs	MLWS	0.7 m	-1.5 m
Lowest Astronomical Tide	LAT	0.2 m	-2.0 m

1.2.3.3 The maximum astronomical tidal variation is 4.5 m (between HAT and LAT). As noted in ERM (2023), ABPmer (2008) modelled the mean spring tidal range in the Array Area as 3.3 m, and 1.5 m during the mean neap tide, which is in close agreement with the values presented in **Table 1-5**. Whilst the peak spring tidal excursion ellipse is equal to an approximate 6 km offset from the Array Area and OCAS.

1.2.4 DEPTH VARIATION

1.2.4.1 The Array Area lies within water depths of approximately 50-70 m, whilst the OCAS lies within water depths of approximately 5-50 m. Rock outcrops are seen along the coast, extending across the OCAS and into the southeastern edge of the Array Area.

1.2.5 QUALITY, STRUCTURE AND SUBSTRATE OF THE BED

1.2.5.1 The regional bedrock geology of the Offshore Project Boundary is characterised by complex lithologies of Lewisian gneiss, Torridonian sandstone, and Mesozoic sedimentary rocks. The Lewisian gneiss complex, some of the oldest rocks in Europe, underlies much of the Outer Hebrides/*Na h-Eileanan Siar* and extends offshore beneath a veneer of Quaternary deposits. These ancient metamorphic rocks form a structurally complex basement, often overlain by younger sequences of sandstones, siltstones and mudstones deposited during the Mesozoic and Palaeozoic eras.

1.2.5.2 Superficial geological deposits are largely the result of glacial and post-glacial processes. Quaternary sediments include till, glaciofluvial sands and gravels, and post-glacial marine deposits. The glacial history of the region has led to variable sediment thickness across the Offshore Project

Boundary, with some areas displaying thin sediment cover over bedrock, while others contain infilled depressions or palaeochannels with significantly thicker accumulations.

1.2.6 STRUCTURE OF THE INTERTIDAL ZONE

1.2.6.1 The intertidal area of the Offshore Project is composed predominantly of boulders and bedrock. Solid bedrock is predominant in more exposed regions while cobbles and sand are present in sheltered bays. EUNIS habitat data from 2019 suggests that the intertidal zone within the Offshore Project Boundary is composed of A3: infralittoral rock and other substrata (EMODnet, 2025).

Freshwater zone

1.2.6.2 The Isle of Lewis/*Eilean Leòdhais* contains an assemblage of surface watercourses, lochs and lochans draining extensive areas of blanket bog. Several river water bodies drain into the Gallan Head/*Àird Uig* to the Butt of Lewis/*Rubha Robhanais* coastal water body; however, no transitional or estuarine water bodies are present where the watercourses meet the sea. Some rivers drain into lochs that then drain into the sea via small channels. Conductivity, Temperature, Depth (CTD) data was collected quarterly from January 2023 until July 2024 at 2 site locations off Lewis/*Eilean Leòdhais* (P2: 58˚23.276'N, 006˚47.264'W & P1: 58˚24.377'N, 006˚47.510'W). The mean salinity recorded between October to December 2023, January to May 2024 and May to July 2024 was 34.87, 34.78, and 34.66PSU, respectively. Using these monitored parameters, marine water quality at the Offshore Project is comparable to typical salinity in the open sea (typically 34 salinity units around the UK, with electrical conductivity of seawater typically around 50 mS/cm), demonstrating the minimal influence of freshwater inputs on marine water quality at the Offshore Project.

Wave exposure

1.2.6.3 ABPmer (2018), developed the SEASTATES hindcast database covering a period from 1979 onwards, to provide water level and flow parameters generated by both astronomical (tidal) and metrological forces across the North West Continental Shelf and North Sea. The model wave climate indicates a predominant westerly direction with up to approximately 10% of the westerly waves being greater than 4 m in height (H_s). A smaller proportion of waves originate from southwest, northwest, north and northeasterly directions with significant wave heights from these directions also exceeding 4 m.

1.2.6.4 ERM (2023) states that the annual mean significant wave height (H_s) is 2.29 m within the Study Area (ABPmer, 2008), with seasonal mean H_s values of 3.02 m in winter to 1.57 m in summer (2.18 m in spring and 2.42 m in autumn) (ABPmer, 2008).

1.2.6.5 Measured data from within the Offshore Project Boundary (collected between October 2023–May 2024) broadly aligns with the values obtained from the ABPmer SEASTATES data (**Table 1-6**). Refer to **Chapter 9, Volume 2a** of the EIAR for a more detailed description of the wave climate within the Offshore Project Boundary.

Table 1-6: Wave statistics derived from measured Directional Wave Rider buoy (October 2023 – May 2024).

Parameter	Min	Max	Mean
Wave Period, Tp	4.2 s	22.2 s	11.4 s
Significant Wave Height, Hs	0.62 m	9.79 m	2.90 m

1.2.7 BIOLOGICAL QUALITY ELEMENTS FOR COASTAL SURFACE WATER BODIES

Phytoplankton

1.2.7.1 The phytoplankton quality element for coastal waters is assessed using the Coastal Water Phytoplankton Tool[1]. This considers 3 separate indices covering:

- Phytoplankton biomass (based on chlorophyll measurement);
- Number of occasions in a season when phytoplankton numbers exceed a defined threshold (number of 'blooms');
- Seasonal ratios of diatoms and dinoflagellates.

1.2.7.2 The 3 indices are averaged to provide an overall phytoplankton assessment. The measured conditions (observed values) are compared against those described for reference conditions (minimally disturbed) to provide an Ecological Quality Ratio (EQR), whose values are used to indicate the status of the water body.

1.2.7.3 The phytoplankton quality element status is affected by nutrient concentrations in the coastal water, thus any activity involving discharge of or mobilisation of nutrients has the potential to affect the WFD status.

1.2.7.4 Phytoplankton in the Gallan Head/*Àird Uig* to the Butt of Lewis/*Rubha Robhanais* and Loch Roag/*Loch Ròg* water bodies are both currently assessed as High.

1.2.7.5 No phytoplankton data were recorded during the site-specific surveys for the Offshore Project Area. However, Marine Scotland monitor plankton in Scottish coastal waters[2]. The highest number of diatoms in the water on the Scottish West Coast is observed in March. Since monitoring began there has been a change in the dominant species of the spring diatom bloom. The diatom genus *Chaetoceros* was observed to be more abundant in the 1990s, but more recently the diatom *Skeletonema* has been observed to be dominant.

[1] UKTAG (2014) *UKTAG Coastal Water Assessment Method: Phytoplankton. Coastal Water Phytoplankton Tool*. Published by Water Framework Directive – United Kingdom Technical Advisory Group (WFD-UKTAG). April 2014

[2] Scottish Government (2023) *Scotland's Marine Atlas: Information for The National Marine Plan*. Available online: PLANKTON - Scotland's Marine Atlas: Information for The National Marine Plan - gov.scot (www.gov.scot) [Accessed 24 February 2026].

Angiosperms

1.2.7.6 Angiosperms were not identified within site specific surveys for the Offshore Project. Loch Roag/*Loch Ròg* Lagoons SAC however is known to have eelgrass (*Zostera spp*.) beds in the Tob Valasay lagoon. The following eelgrass biotopes are also recorded as present within Loch Roag/*Loch Ròg*: *Zostera marina/angustifolia* beds on lower shore or infralittoral clean or muddy sand, *Zostera noltii* beds in littoral muddy sand and *Zostera noltii* beds in littoral muddy sand and *Zostera marina/angustifolia* beds on lower shore or infralittoral clean or muddy sand (NatureScot, 2025).

Macroalgae

1.2.7.7 A comprehensive PMF survey was therefore conducted by OEL utilising Unmanned Aerial Vehicle (UAV) and Remotely Operated Vehicle (ROV) to capture more seabed imagery of the area to better characterise the seabed and map the extent of kelp beds within the OCAS.

1.2.7.8 The shallow (<20 m) eastern area of the OCAS features a large expanse of bedrock and stony reef supporting kelp wherein the dominant EUNIS biotope identified in both DDC and ROV imagery was A3.214 '*Laminaria hyperborea* and foliose red seaweeds on moderately exposed infralittoral rock'. This area represents the PMF habitat 'Kelp beds'.

1.2.7.9 Kelp beds were mapped across a 9.7 km^2 area. ROV imagery was utilised alongside acoustic data and UAV outputs to define boundaries and map the extent of this PMF habitat. Kelp beds were found to be almost continuously present along the entire length of the nearshore region of the PMF survey area, mapped with high confidence in the north and central regions and low confidence to the south due to sparser ground-truthing data. Interpretation of the acoustic data identified some potential gaps in the extent of kelp, the most prominent of which was located within the area of search of cable route option 2B.

1.2.7.10 DDC stills and videos captured during the environmental characterisation survey identified EUNIS biotopes within the Offshore Project Boundary which included biotopes defined by the presence of macroalgae species. 3 different macroalgal biotopes were recorded within the Offshore Project Boundary. The macroalgal biotopes recorded in the surveyed areas were:

- A3.214 *Laminaria hyperborea* and foliose red seaweeds on moderately exposed infralittoral rock;
- A3.116: Foliose red seaweeds on exposed lower infralittoral rock;
- A4.2141: *Flustra foliacea* on slightly scoured silty circalittoral rock.

1.2.7.11 In addition to the biotopes recorded in the environmental characterisation survey, EUNIS habitat data is available from 2011 surveys conducted between Siadar and Coig Peighinnean Bhuirgh by Royal Haskoning for the Lewis Wave Array Project (Royal Haskoning, 2011). This survey suggests that the intertidal regions within the Offshore Project Boundary are composed of several macroalgal biotopes including:

- A1.21 Barnacles and fucoids on moderately exposed shores (LR.MLR.BF);
- A1.211 *Pelvetia canaliculata* and barnacles on moderately exposed littoral fringe rock (LR.MLR.BF.FvesB);
- A1.213 *Fucus vesiculosis* and barnacle mosaics on moderately exposed mid eulittoral rock (LR.MLR.BF.FvesB);
- A1.2141 *Fucus serratus* and red seaweeds on moderately exposed lower eulittoral rock (LR.MLR.BF.Fser.R);
- A1.411 Corraline crust-dominated shallow eulittoral rockpools (LR.FLR.Rkp.Cor);
- A1.4111 Corraline crusts and Corallina officinalis in shallow eulittoral rockpools (LR.FLR.Rkp.Cor.Cor);
- A1.421 Green seaweeds (*Enteromorpha spp.* and *Cladophora spp*.) in shallow upper shore rockpools (LR.FLR.Rkp.G);
- A3.2111 *Laminaria digitata* on moderately exposed sublittoral fringe bedrock (IR.MIR.KR.Ldig.Ldig);
- A3.2112 *Laminaria digitata* and under-boulder fauna on sublittoral fringe boulders (IR.MIR.KR.Ldig.Bo).

Benthic Invertebrates

1.2.7.12 Within the 11 macrobenthic samples collected across the Offshore Project Boundary during the environmental characterisation survey, a total of 957 individuals and 95 taxa were recorded. Nematoda (roundworms) were the most abundant taxa (20.7%) closely followed by the bivalve *Goodallia triangularis* and the polychaete *Pisione remota*. The family of polychaete *Polygordius, P.remota* and Nematoda were the most frequently occurring species appearing in all of the 11 samples. Annelida taxa were the highest contributors to overall abundance and diversity. Abundance and diversity were relatively homogenous across the Offshore Project Boundary as grab samples were only collected in areas of soft sediments with similar characteristics therefore supporting a similar macrobenthic community.

1.2.7.13 Across the Offshore Project Area, 2 taxa of interest were identified, the polychaete *Goniadella gracilis* and one juvenile belonging to the economically important family of clams Veneridae. However, no species of conservation interest were sampled.

1.2.7.14 Seabed imagery collected using DDC was analysed for the most commonly occurring epifauna. The analysis identified that the most commonly occurring epifauna were tubeworms of the family Serpulidae, identified in 318 of the 550 images analysed. The encrusting bryozoan *Parasmittina trispinosa* was the second most common species identified in 232 images followed by cup corals (109 images) and the soft coral *Alcyonium digitatum* (103 images). Echinoderms such as the brittlestars *Ophiothrix fragilis* and *Ophiocomina nigra* were also common.

1.2.8 PHYSICO-CHEMICAL QUALITY ELEMENTS AND WATER QUALITY

1.2.8.1 WFD targets in the form of EQS are set out in *The Scotland River Basin District (Standards) Directions 2014*.

1.2.8.2 During baseline data collation for the assessment of marine water quality, Met Ocean data on CTD was collected quarterly from January 2023 until July 2024. Data was collected at 2 site locations off Lewis (P2: 58˚23.276'N, 006˚47.264'W & P1: 58˚24.377'N, 006˚47.510'W). Data collected from site P2 (near bed RBR) is presented below in **Table 1-7**.

Table 1-7: Quarterly CTD monitoring results

	Minimum			Mean			Maximum		
Parameter	**Oct - Dec 2023**	**Jan - May 2024**	**May - Jul 2024**	**Oct - Dec 2023**	**Jan - May 2024**	**May - Jul 2024**	**Oct - Dec 2023**	**Jan - May 2024**	**May - Jul 2024**
Depth (m)	43.5	44.27	44.28	45.58	46.69	46.22	48.24	49.66	48.16
Salinity (PSU)	34.59	34.42	34.48	34.87	34.78	34.66	35.01	35.03	34.89
Temperature (˚C)	9.33	7.72	9.1	10.93	8.53	10.92	12.42	9.62	12.93

Specific Pollutants, Priority Substances, and Priority Hazardous Substances

1.2.8.3 Whilst specific pollutants, priority substances and priority hazardous substances in water were not surveyed during site specific water quality surveys, seabed sediments were surveyed and analysed for contaminants. Sediment quality analysis identified 2 samples that exceeded CEFAS action level 2 (AL2) for Nickel (Ni), and one station that exceed OSPAR BAC for Ni. However, no other reference levels were exceeded, see **Table 1-8** for all metal concentrations.

1.2.8.4 Elevated metal sediment concentrations do not necessarily imply toxicity to benthic communities (Rees *et al.*, 2007) as the bioavailability of these metals is more important than simply concentration levels. Despite the elevated Ni concentrations recorded at these 2 stations, across the Offshore Project Boundary as a whole, no macrobenthic anomalies were identified to suggest any adverse effects were present. No stations had metals concentrations above OSPAR BAC/ERL concentrations, overall meaning that adverse biological effects are unlikely.

Table 1-8: Summary of heavy and trace metal concentrations (mgkg^{-1}) across the Array Area for Marine Sediment and Water Quality

Station	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
ST003	5.7	0.11	4.2	3.2	3.5	< 0.01	9.8	10
ST004	5.6	0.07	4.3	3.9	4.9	< 0.01	7.7	10.7
ST023	5.3	0.06	10.7	14.7	3	< 0.01	**28.5**	9.7
ST035	5.2	0.1	3.7	2.8	3.9	< 0.01	13.3	12.1
STAD005	2.9	0.17	5	5.3	3.2	0.01	12.4	13.9
STAD007	4.8	0.11	4.7	3	3.3	< 0.01	8.4	10
STAD008	5.6	0.09	23.1	25	4	< 0.01	**58.2**	30.6
Min	2.9	0.06	3.7	2.8	3	<0.01	7.7	9.7
Max	5.7	0.17	23.1	25	4.9	0.01	58.2	30.6
Mean	5.01	0.10	7.96	8.27	3.69	<0.01	19.76	13.86
Standard error	0.34	0.01	2.48	2.97	0.23	-	6.43	2.64
CEFAS AL1	20	0.4	40	40	50	0.3	20	130
CEFAS AL2	100	5	400	400	500	3	200	800
OSPAR BAC	25	0.31	81	27	38	0.07	36	122
Effect Range Low (ERL)	8.2*	1.2	81	34	47	0.15	21*	150
Threshold Effect Level (TEL)	7.24*	0.7	52.3	18.7	30.2	0.1	-	124

1.2.8.5 PAH concentrations were compared to CEFAS Action Level 1 (AL1) (no CEFAS AL2 concentrations are available for PAHs), OSPAR Background Assessment Concentration (BAC) levels, Effects Range Low (ERLs), Threshold effect level (TELs) and Probable Effect Level (PELs) where possible. All the PAHs analysed were measured below the limit of detection (LoD). Ratios of hydrocarbons are typically used to assess the source origin of hydrocarbons and gain a better understanding of whether these contaminants are derived from anthropogenic activities or are of natural origin. However, as hydrocarbons were <LoD at all stations this assessment could not be carried out, overall indicating that hydrocarbon concentrations across the Project Area are of no concern. All PCBs, OCPs, dibutyltin (DBT), tributylin (TBT) and organotins were also measured <LoD at all stations.

Dissolved Oxygen

1.2.8.6 Time series data (1960-2010) of physical and chemical parameters, including dissolved oxygen from the west coast of the Outer Hebrides/*Na h-Eileanan an Iar* have been utilised (Marine Directorate, 2014). Shelf sea surface waters were generally found to be oxygen rich, with concentrations averaging 6-8 mgl^{-1} (Lozier *et al.,* 1995), corresponding to 90-106% saturation, and affected by seasonal variation in temperature influencing oxygen solubility (Marine Directorate, 2014) and by algal growth. Correspondingly, higher chlorophyll-a concentrations (1.87) are associated with the higher dissolved oxygen concentrations.

Turbidity

1.2.8.7 Total suspended sediment data from Cefas demonstrates the spatial distribution of average non-algal suspended particulate matter (Cefas, 2016). Data for the northeast of the Isle of Lewis/*Eilean Leòdhais* where the Offshore Project is located shows average levels of <1mgl^{-1} (average between 1998-2015). Even in winter suspended particulate matter is always <5mgl^{-1}.

Water Temperature

1.2.8.8 Water temperature exhibits seasonal variations in temperature at the quarterly sampling point, with the lowest temperature recorded in January–May 2024 (7.72°C) and the highest recorded in May–July 2024 (12.93°C).

1.2.9 GROUNDWATER BODY STATUS

1.2.9.1 The Lewis and Harris groundwater body (ID: 150695) lies within the Scotland River Basin District and covers an area of approximately 2,108.9 km^2. This groundwater body is underlain predominantly by Lewisian gneiss, a hard, crystalline bedrock associated with low-productivity fracture-flow aquifers (SEPA, 2015). As a result, groundwater on the island typically occurs in shallow discontinuous fractures, with limited storage, low transmissivity and short flow paths. These hydrogeological characteristics mean that groundwater flow systems tend to be highly localised and strongly influenced by surface topography (SEPA, 2015).

1.2.9.2 Despite the limited aquifer productivity, groundwater remains an important receptor in the Western Isles, supporting private water supplies, small springs, wetland habitats and baseflow contributions to local watercourses. However, unlike major sedimentary aquifers on the Scottish mainland, the groundwater system in Lewis and Harris is not heavily utilised and is not subject to significant abstraction pressures.

1.2.9.3 The Lewis and Harris groundwater body is consistently classified at Good overall status with both chemical and quantitative components meeting the requirements for Good status, with no recorded failures or deteriorating trends.

Chemical Status

1.2.9.4 All chemical quality elements assessed under the WFD are classified as Good. This includes:

- General chemistry (pH, dissolved oxygen, conductivity);
- Nutrients (e.g., nitrates);
- Major ions;
- Surface water interaction elements;
- Specific pollutants;
- Priority and hazardous substances.

1.2.9.5 No chemical quality elements indicate exceedances of environmental standards, nor are there any upward trends in pollutant concentrations. Overall, the status of the Lewis and Harris groundwater body demonstrates a stable and chemically robust groundwater environment with no evidence of significant anthropogenic contamination pressure.

Quantitative Status

1.2.9.6 Quantitative elements are also consistently classified as Good, demonstrating:

- No significant abstraction pressures;
- No evidence of saline intrusion;
- No groundwater-dependent surface water body deterioration;
- A stable groundwater balance.

1.2.9.7 These outcomes reflect the low-productivity nature of the bedrock aquifer and the absence of significant licensed abstractions or large-scale water demand across the Isle of Lewis/*Eilean Leòdhais*.

1.3 REFERENCES

SEPA (2015). Scotland's Aquifers and Groundwater Bodies. Available at: https://www2.bgs.ac.uk/groundwater/waterResources/ScotlandsAquifers.html [Accessed: January 2026].