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IOSEA6

SCOPING REPORT - APPENDIX C

C.9 WATER QUALITY

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Intertek Energy & Water Consultancy Services
Exchange House, Station Road, Liphook, Hampshire GU30 7DW, United Kingdom

C.9 WATER QUALITY

This section aims to describe the Water Quality baseline within and around the IOSEA6 Study Areas, this includes contaminants of interest, coastal and transitional water quality, crude oil fate and behaviour during spills and ocean circulation. This section describes the baseline, existing environmental sensitivities and potential sensitives of Water Quality to the Plan. The baseline draws on information from IOSEA4 and IOSEA5, providing updates where applicable.

The key pieces of legislation which apply to water quality in Ireland are The Marine Strategy Framework Directive (MSFD) (European Directive 2008/56/EC) and The EU Water Framework Directive (WFD) (2000/60/EC). Monitoring and reporting to comply with these directives is undertaken in Ireland and has been used to inform this section's baseline.

The Marine Strategy Framework Directive

The MSFD was established in Ireland in 2012 with the purpose of protecting the marine environment. An ecosystem-based approach to the management of human activities, enabling a sustainable use of marine goods and services is required to implement it (Marine Institute, 2022).

In order to implement the Directive each member state is required to:

- describe what they consider is a clean, healthy and productive sea i.e. Good Environmental Status (GES);
- monitor and assess the quality of their seas against Good Environmental Status, and
- ensure they take appropriate action by 2020 to maintain or achieve Good Environmental Status.

The Department of Housing, Local Government and Heritage (DHLGH) repeat the above process every six years. The latest MSFD report was issued in 2020. The assessment process considers 11 qualitative descriptors for determining GES which are under Article 9 of the Directive (DHLGH, 2020). Additionally, a Commission Decision (2017/848) sets out 'Primary and Secondary Criteria' across each of the descriptors which provide for a clearer framework (DHLGH, 2020).

Water Framework Directive

The WFD requires all Member States to protect and improve water quality in all waters so that member states can achieve good ecological status by 2015 or, at the latest, by 2027 (DHLGH, 2022). It was given legal effect in Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003). It applies to rivers, lakes, groundwater and transitional coastal waters (DHLGH, 2022). The Directive requires that management plans be prepared on a river basin basis and specifies a structured method for developing these plans (DHLGH, 2022).

A new directive 2013/39/EC amended Directives 2000/60/EC and 2008/105/EC 'requirement of phasing out of priority hazardous substances and reducing pollution from discharges of priority substances and compliance with the environmental quality standards'(SEPA, n.d.). This new directive was established in 2013, the 46 substances are outlined in Table C-48.

Table C-48 irective Priority Substances

No	EU number	Name of Priority Substance
1	240-110-8	Alachor
2	204-371-1	Anthracene
3	217-617-8	Atrazine

No	EU number	Name of Priority Substance
4	200-753-7	Benzene
5	not applicable	Brominated diphenylethers
6	231-152-8	Cadmium and its compounds
7	287-476-5	Chloroalkanes, C 10-13
8	207-432-0	Chlorfenvinphos
9	220-864-4	Chlorpyrifos (Chlorpyrifos-ethyl)
10	203-458-1	1,2-dichloroethane
11	200-838-9	Dichloromethane
12	204-211-0	Di(2-ethylhexyl)phthalate (DEHP)
13	206-354-4	Diuron
14	204-079-4	Endosulfan
15	205-912-4	Fluoranthene
16	204-273-9	Hexachlorobenzene
17	201-765-5	Hexachlorobutadiene
18	210-168-9	Hexachlorocyclohexane
19	251-835-4	251-835-4
20	231-100-4	Lead and its compounds
21	231-106-7	Mercury and its compounds
22	202-049-5	Naphthalene
23	231-111-4	Nickel and its compounds
24	not applicable	Nonylphenols
25	not applicable	Octylphenols(6)
26	210-172-0	Pentachlorobenzene
27	201-778-6	Pentachlorophenol
28	not applicable	Polyaromatic hydrocarbons (PAH)(7)
29	204-535-2	Simazine
30	not applicable	Tributyltin compounds
31	234-413-4	Trichlorobenzenes
32	200-663-8	Trichloromethane (chloroform)
33	216-428-8	Trifluralin
34	204-082-0	Dicofol
35	217-179-8	Perfluorooctane sulfonic acid
36	not applicable	Perfluorooctane sulfonic acid its derivatives (PFOS)
37	not applicable	Quinoxyfen
38	277-704-1	Dioxins and dioxin-like compounds

No	EU number	Name of Priority Substance
39	255-894-7	Aclonifen
40	248-872-3	Bifenox
41	257-842-9	Cybutryne
42	200-547-7	Cypermethrin(10)
43	not applicable	Dichlorvos
44	200-962-3/	Hexabromocyclododecanes (HBCDD)
45	212-950-5	Heptachlor and heptachlor epoxide
46	886-50-0	Terbutryn

(DIRECTIVE 2013/39/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 12 August 2013 amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy)

River Basin Management Plans

River Basin Management Plans (RBMPs) aim to protect the water environment. The plans are reviewed every six years and set out the actions that are needed to improve water quality. The latest RBMP covers the period of 2022-2027. The plan has undergone consultation stage and will be finalised in the coming months.

Bathing Water Directive

Bathing water directive aims to introduce stricter standards of water quality and along with a higher quality of testing to enhance the protection and health of sea swimmers. This method of assessment allows for the management of bathing waters and pollution risks to be handled in a more proactive manner. This directive allows for the increased level of information transfer between the authorities and the general public. The bathing water directive categorises bathing waters into four categories, ranging from "'Excellent' 'Good', 'Sufficient', or 'Poor' with a minimum target of 'Sufficient' required to be achieved for all bathing waters"(Wise Freshwater, 2020). This directive involves the assessment of bathing water by monitoring two types of bacteria, Escherichia coli and intestinal enterococci, these two bacterium mainly come from raw sewage, as well as live stock breeding. This piece of legislation is one of the oldest pieces of law developed by the EU, in terms of Ireland, the EPA is responsible for monitoring bathing water quality. In 2022 the organisation found that the bathing water quality of Ireland is continuing to improve with "97% of sites across the country meeting or exceeding minimum standard"(Hennessy, 2022). '115 of the 148 designated bathing water sites were of excellent standard' (EPA, 2022).

"Balbriggan's Front Strand beach in Dublin received a poor quality rating as it is impacted by sewage discharges and misconnections; faeces from dogs, birds and other animals and contaminated surface streams flowing through the town"(Hennessy, 2022).

85 beaches were awarded blue flag status in 2021, along with 10 Marinas in Ireland. The blue flag award is a world renowned eco-label, the blue flag programme aims to promote environmental awareness and promote comprehensive environmental management of beaches, marinas and eco-tourism boats around the world.

The ten marina's that were awarded blue flag status in 2021 were:

Table C-49 Blue Flag Marinas (Beach Award's, 2022)

County	Marina
Cork	Kinsale Yacht Club
Cork	The Royal Cork Yacht Club Marina
Clare	Kilrush Marina
Donegal	Greencastle Marina
Donegal	Rathmullan Marina
Kerry	Fenit Marina
Kerry	Portmagee Seasonal Marina
Westmeath	Quigley's Marina
Wexford	Kilmore Quay Marina
Wexford	New Ross Marina

Shellfish Directive

The shellfish directive was introduced to Irish law in 2006, the aim of the directive is to "protect or improve shellfish waters in order to support shellfish life and growth" (Irish River Project, 2021). Aquatic environment species such as bivalve's and gastropod molluscs, which include oysters, mussels, cockles, scallops and clams. Ireland must comply with EU requirements in terms of microbiological, physical and chemical targets, which must be adhered to or bettered for the safety of the shellfish population. There are 64 established shellfish sites that must adhere to the shellfish directive.

C.9.2 Contaminates of Interest

Contaminants are substances that are introduced into the environment by people at concentrations or in areas that they would not ordinarily occur. Contaminants can enter marine systems through a variety of channels or mechanisms. The sources of input are mainly through land-based sources, such as run-off from industrial activity but can also be introduced within the marine environment, for example from shipping, accidental spills or operational discharges (Tornero and Hanke, 2016; EC, 2022).

A study conducted by Tornero and Hanke (2016) focusing on European waters identified a list of 276 potential contaminants which can be emitted into the sea from sea based sources. They found that offshore oil and gas operations contribute the highest number of substances followed by shipping and mariculture activities.

Contaminants can influence biological processes through direct acute or chronic toxicity at high enough concentrations. Chronic impacts include altered food and nutrient availability, higher mutation rates interference with reproductive function, and mortality. Contaminants have the ability to disturb ecological systems at both the species and community levels if they are present in high enough concentrations. Synthetic substances can linger in the environment for a long time and many of them are toxic to biota.

C.9.2.1 MSFD Descriptor 8: Contaminants

Descriptor 8 of the MSFD relates to Contaminants and provides an assessment of contaminants in the maritime area which covers the IOSEA6 Study Area. The MSFD determines GES for contaminants when 'Concentrations of contaminants are at levels not giving rise to pollution effects' (DHLGH, 2020).

The assessment was carried out against two primary criteria and one secondary criteria (EC, 2017):

- D8C1 (Primary) Concentrations of Contaminants
- D8C2 (Secondary) Biological Effects
- D8C3 (Primary) Acute Pollution Events

The assessment highlights the following (DHLGH):

- Concentrations of priority substances in water in coastal and transitional water bodies are typically low and compliant with Environmental Quality Standards;
- Concentrations of contaminants in shellfish are generally above OSPAR background levels, however, they are not at levels where adverse effects would be expected to occur;
- Although many legacy pollutants are highly persistent in the environment, where significant temporal trends in contaminant concentrations are evident, they are typically downwards;
- There has been a marked improvement in reproductive condition in dogwhelks following the banning of TBT as a marine antifoulant; and
- Monitoring indicates a low impact of acute pollution events in the maritime area.

Within its coastal territory, Ireland has obtained Good Environmental Status for pollutants in fish and seafood for human consumption (DHLGH, 2020).

Persistent organic compounds are a large, diverse group of synthesised chemicals that due to their structure are not readily degraded in the environment. The group includes a wide range of chlorinated hydrocarbons and organometals some of which are known to be environmentally damaging. Many persistent organic compounds are known to exhibit relatively high acute and/or chronic toxicities to marine life and are liable to bio-accumulate in biological tissues (Harmon, 2015; Honda and Suzuki, 2020).

Between 2012 and 2017, seafood samples taken from shellfish growing waters and commercial fishing sites around Ireland showed a continuously high level of compliance (99.7%) with the Maximum Limits set out in Commission Regulation 1881/2006 EC, as amended (DHLGH, 2020). Mercury, cadmium, lead, indicator polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins, and polychlorinated dibenzofurans (PCDD/Fs – dioxins), sum of PCDD/Fs and dioxin-like PCBs, and polyaromatic hydrocarbons are all examples of pollutants (PAH) (DHLGH, 2020).

An overall compliance of 99.5 percent was attained out of 1422 individual test results for metals in all samples. For 853 individual test results, organic compounds showed 100 percent compliance. The overall compliance rating for 2273 test sites was 99.7% (DHLGH, 2020).

C.9.3 Coastal and Water Quality

Transitional and coastal waters in Ireland cover an area of over 14,000 km^2 (transitional 844 km^2; coastal 13,325 km^2) and include lagoons, estuaries, large coastal bays, and exposed coastal portions. Estuaries and lagoons are classified as transitional waters (EPA, 2019b). The majority of marine pollution occurs around the shore and has been linked to the rise in large-scale industry and agricultural practises over the last century (Beiras, 2018). Contaminants reach the maritime environment mostly through direct transfer from dumping, discharges into rivers and air emissions.

Water Quality in Ireland

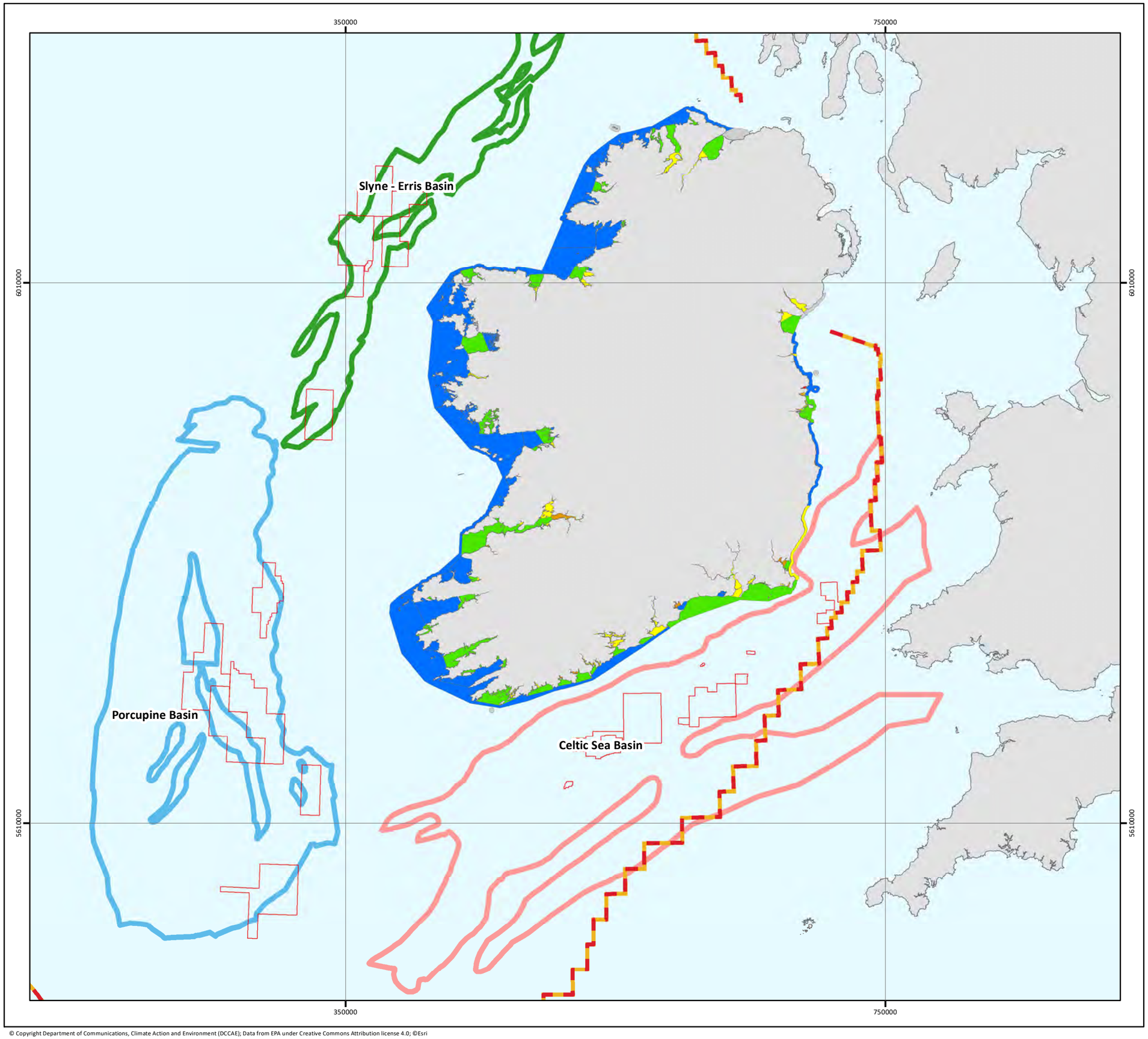
Since the implementation of the WFD, the EPA has produced a report every six years on the ecological status of water quality in Ireland (EPA, 2019b). The latest report is available for the period 2013 to 2018. Ireland's saline waters are made up of 304 water bodies (110 coastal and 194 transitional), with about 40% of them being monitored as part of the national WFD monitoring programme (EPA, 2019b).

In addition to monitored status, information on unmonitored water bodies is also presented. This is done by extrapolating status from monitored water bodies to comparable unmonitored water bodies under similar pressures (EPA, 2019b).

The results of the transitional and coastal water quality monitoring are taken from the EPA 2019 report as follows:

- 30 transitional water bodies (38%) are in high or good ecological status and 49 (62%) are in moderate, poor or bad ecological status.
- 36 coastal water bodies (80%) are in high or good ecological status which is substantially higher than the European average of 54.6%. Nine coastal water bodies (20%) are in moderate ecological status and a single water body is in bad status (Rincarna Pools Lagoon, Co. Galway). In terms of surface area, 93% of coastal waters are in high or good ecological status.
- Ten transitional water bodies improved in status, 13 declined and 47 remained unchanged. This represents a net decline in status of three water bodies since 2010- 2015.
- Eleven coastal water bodies improved in status, 9 declined and 22 remained unchanged. This represents a net improvement in the ecological status of two water bodies since 2010-2015.
- A quarter (24.5%) of transitional and coastal water bodies failed the environmental quality standard and assessment criteria for dissolved inorganic nitrogen (DIN).
- Loadings of phosphorus and nitrogen to the marine environment have started to increase after many years of reductions. The average total nitrogen and total phosphorus loads have increased by 8,806 tonnes (16%) and 329 tonnes (31%), respectively, since 2012-2014.

Current status of the coastal and transitional WFD waterbodies is shown in Figure C-44 (Drawing Reference: P2510-WAT-003).



IOSEA6 - ENVIRONMENTAL REPORT

WATER

Water Framework Directive (WFD)
Transitional and Coastal Waters

Drawing No: P2510-WAT-003 | **B**

Legend

- IOSEA6 Area
- EEZ Boundary
- 12 NM Limit

Transitional and Coastal Water Ecological Status

2013-2018

- High
- Good
- Moderate
- Poor
- Bad
- Unknown

Offshore Geological Basin

- Celtic Sea Basin
- Porcupine Basin
- Slyne - Erris Basin

NOTE: Not to be used for Navigation

Date	15 November 2022
Coordinate System	ED 1950 UTM Zone 29N
Projection	Transverse Mercator
Datum	European 1950
Data Source	DECC; EPA; ESRI
File Reference	J:\P2510\Mxd\11_WAT\ P2510-WAT-003.mxd
Created By	Lewis Castle
Reviewed By	Emma Kilbane
Approved By	Emma Langley

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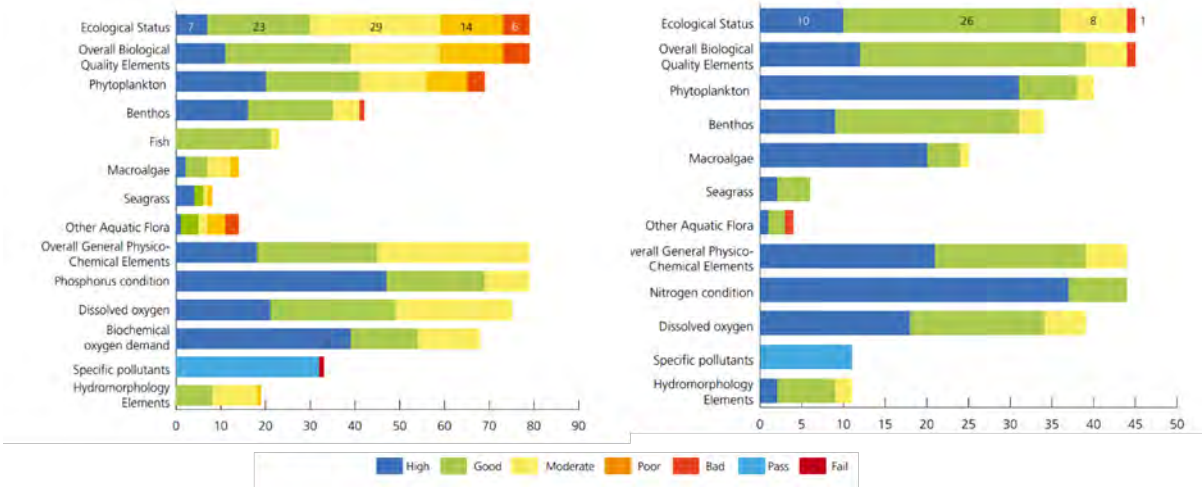
Figure C-46 Ecological status and condition of individual biological quality elements, physicochemical elements and hydro-morphological quality elements in coastal waters in 2013- 2018. Nitrogen condition is based on the assessment of dissolved inorganic nitrogen (DIN).



Note: Figure A represents Transitional Waters, Figure B represents Coastal Water (Note fish is not used an indicator in coastal waters). (Figures taken from EPA, 2019b)

Over three-quarters of monitored coastal water bodies and just under one-third of monitored transitional waters are at 'high' or 'good' ecological status. This means that a quarter of coastal waters and two-thirds of transitional waters need action in order to achieve the objectives of the WFD (EPA, 2022b). Figure C-45 displays the individual status for biological, physiochemical and hydro-morphological elements in coastal waters.

C.9.3.2 Bathing Waters

The EU Bathing Water Directive (2006/7/EC), implemented in Ireland under the Bathing Water Regulations (S.I. No. 79/2008). The Environmental Protection Agency (EPA) collaborates with the Health Service Executive (HSE) and local governments to ensure that swimming is safe at designated beaches and lakes. The EPA defines bathing water quality as 'good', 'sufficient' or 'poor' the status of bathing water quality on identified beaches is updated during the bathing water season which runs from the June 1st to September 15th (EPA, 2022a). The EPA monitors locations which are known " Identified Bathing Water" and other smaller less popular beaches known as 'Other Monitored Waters' are assessed by local authorities as a public health measure.

Identified Bathing Waters

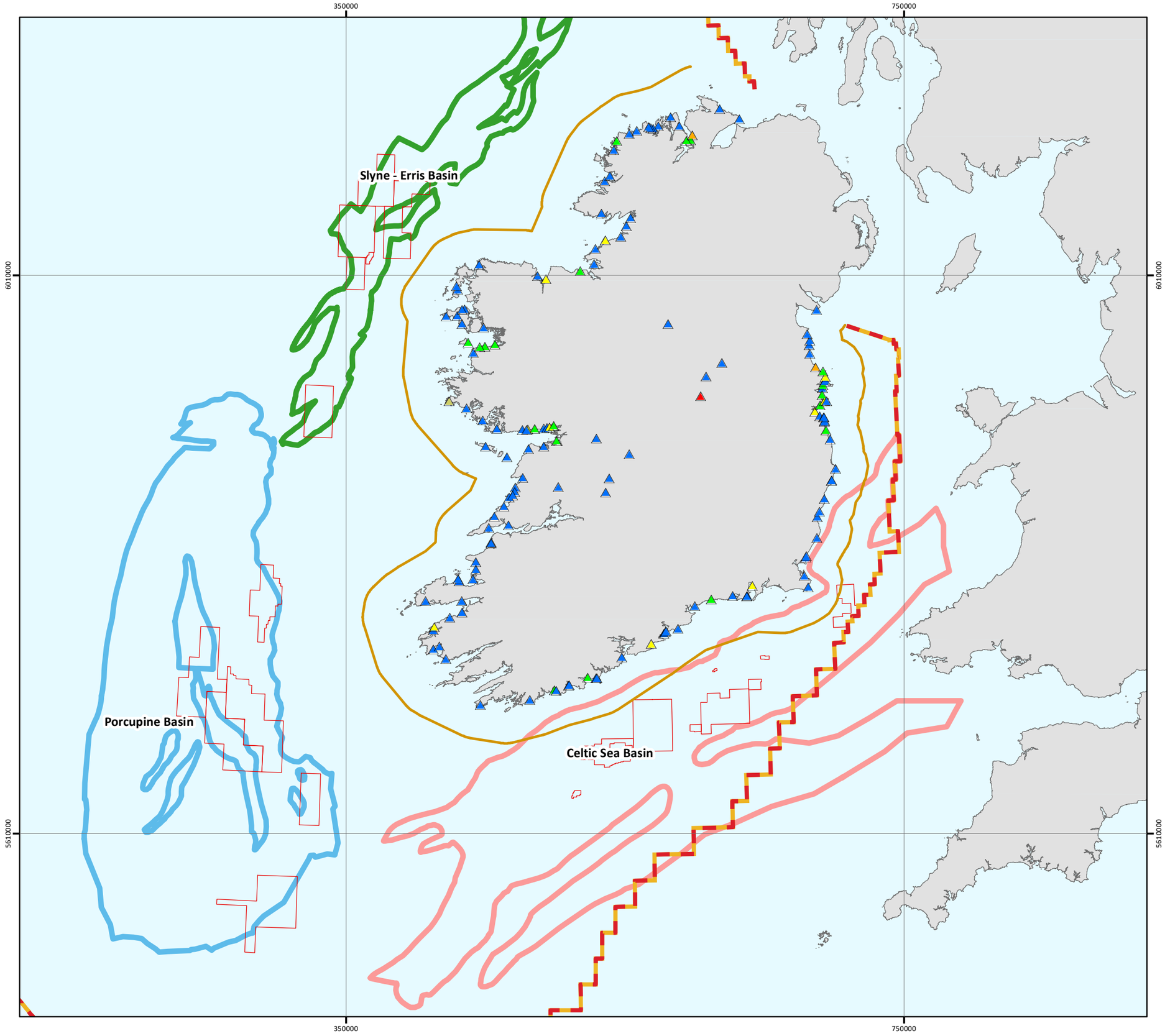
The latest EPA bathing water quality report was released for 2021 and indicated that bathing water continued to improve in 2021. 148 identified bathing waters were assessed and 144 (97%) met or exceeded the minimum required standard to achieve a 'sufficient' classification (EPA, 2021a). Only two classifications of 'Poor' bathing water quality were classified: these were Lady's Bay, Buncrana, Co Donegal; and Balbriggan, Front Strand Beach, Co. Dublin (Figure C-46, Drawing Reference: P2510-WAT-002). This 2021 classification was down by two in comparison to four classifications of 'poor' water quality in 2020 (EPA, 2021a). The main sources of pollution for Balbriggan, Front Strand Beach were sewage discharges and misconnections, faeces from animals and contaminated surface streams flowing from Balbriggan town (EPA, 2021). The Buncrana waste water treatment plant and combined stormwater overflows and surface run-off were highlighted as the sources of pollution at Lady's Bay.

Irish Water have plans in place for both sites to upgrade the pumping stations at these locations which is expected to improve water quality (EPA,2021).

The EPA received 42 reports of bathing water pollution in 2021, compared to 57 in 2020. When reporting events, the local authorities take a preventive approach, which means that not all incidences result in a decrease in bathing water quality. This technique is implemented in order to preserve the health of bathers. Likely causes of the pollution incidents were reported to be the following (EPA, 2021):

- Diffuse pollution from agriculture (29%);
- Urban waste water (19%);
- Proliferation of Cyanobacteria/ Macro-algae (9.5%);
- Contamination from Animals/Birds (24%);
- Misconnections/ run-off from urban areas (9.5%);
- Pollution from Boats (7%); and
- Septic tanks (2%).

All the IOSEA6 Study Areas are located offshore and, therefore, there are no identified bathing waters within the IOSEA6 Study Areas. Additionally, there are no 'poor' bathing water quality locations adjacent to any of the IOSEA6 Study Areas.



IOSEA6 - ENVIRONMENTAL REPORT

WATER
Bathing Waters

Drawing No: P2510-WAT-002 | **B**

Legend

- IOSEA6 Area

Bathing Water Quality

- Excellent
- Good
- Sufficient
- Poor
- New (not yet classified)
- Changed (not yet classified)
- No Data
- EEZ Boundary
- 12 NM Limit

Offshore Geological Basin

- Celtic Sea Basin
- Porcupine Basin
- Slyne - Erris Basin

N W E S

NOTE: Not to be used for Navigation

Date	15 November 2022
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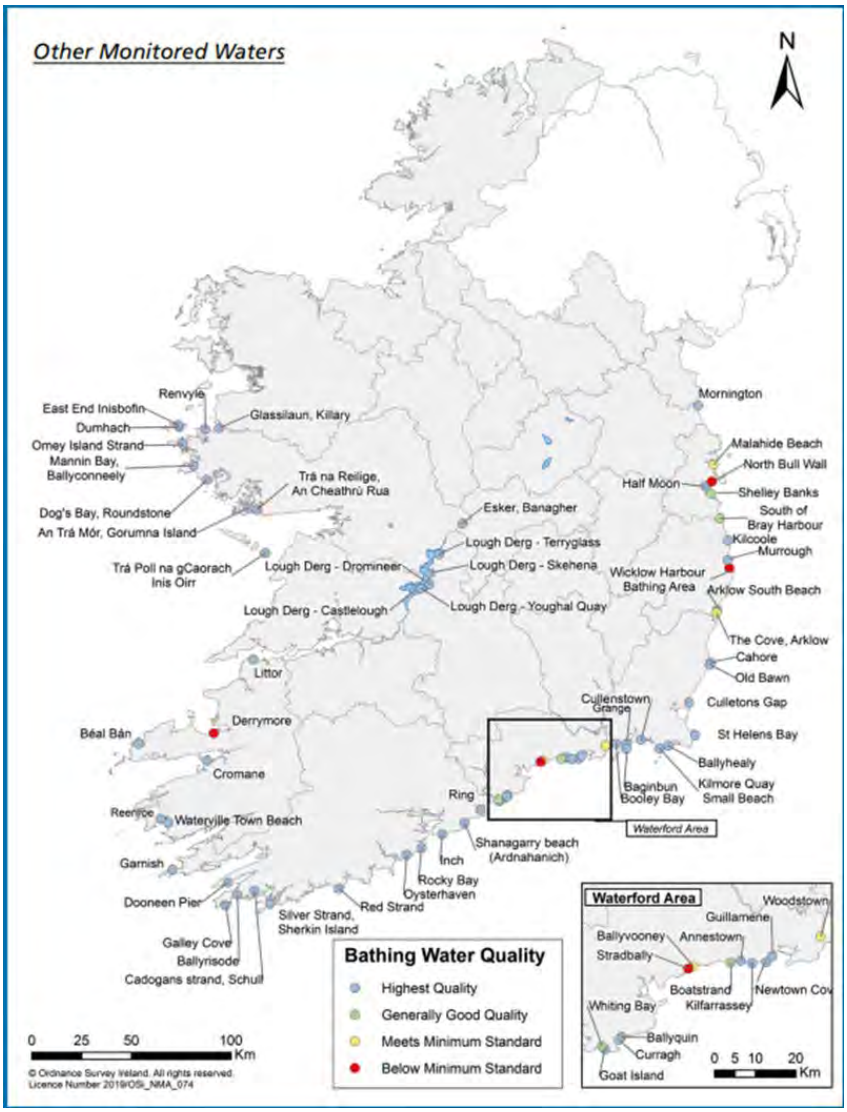
Other Monitored Waters

Other monitored waters are not formally managed under the Bathing Water Regulations but as an interest of public health. Four sites were reported as being below minimum standard for water quality. These sites were Derrymore in Co Kerry, Stradbally, Co. Waterford, Arklow South Beach, Co. Wicklow and, North Bull Wall Co. Dublin. The location and water quality classification of other monitored waters are shown in Figure C-47.

As the IOSEA6 Study Areas are located offshore there are no other monitored bathing waters located with the sites, however, Derrymore is adjacent to the Porcupine IOSEA6 Study Area and Stradbally is adjacent to the Celtic Sea IOSEA6 Study Area.

Figure C-48 Other Monitored Waters Locations and Water Quality Classification (Taken from EPA, 2021)

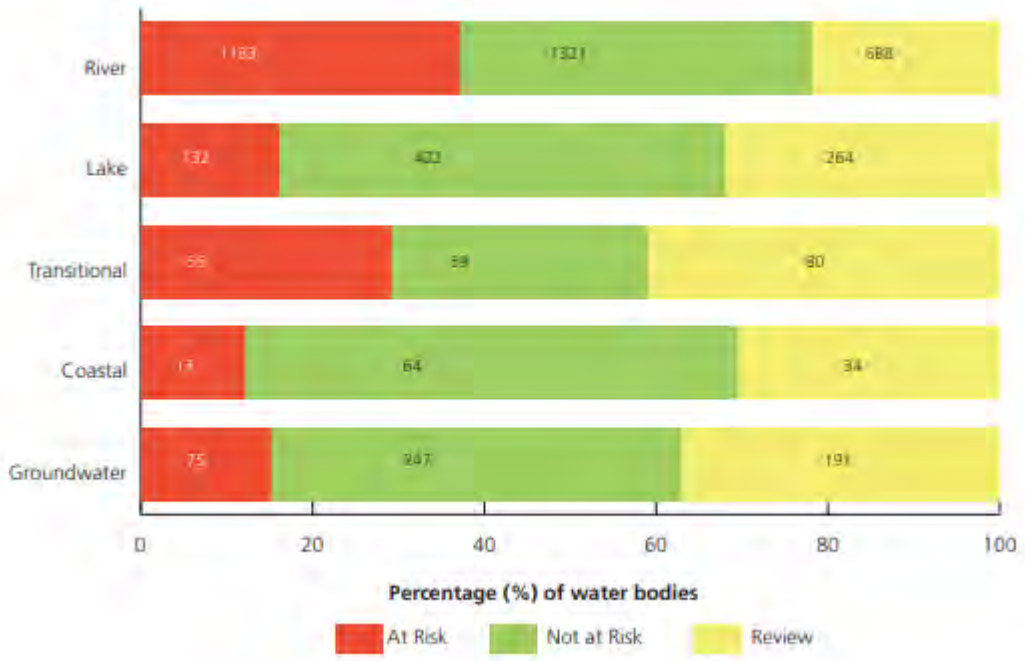


C.9.4 Surface Waters

The WFD requires all Member States to protect and improve water quality in all waters so that Ireland can achieve good ecological status by 2015 or, at the latest, by 2027 (DHLGH, 2022). It was given legal effect in Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003). It applies to rivers, lakes, groundwater and transitional coastal waters (DHLGH, 2022). The Directive requires that management plans be prepared on a river basin basis and specifies a structured method for developing these plans (DHLGH, 2022).

The most recent national WFD monitoring programme for Ireland was completed for 2019-2021. During this assessment 84 transitional water bodies and 47 coastal water bodies were monitored (EPA, 2021b). A number of water bodies now identified as Priority Areas for Action, but previously unmonitored, have been added to the programme (e.g. Bannow Bay). The percentage of water bodies at risk are displayed in Figure C-48.

Figure C-49 Distribution of risk across each of the five individual water categories (Taken from EPA, 2021b)



C.9.4.2 Shellfish Water Quality

The Shellfish Water Directive (SWD) (2006/113/EC), implemented in Ireland under the European Communities (Quality Of Shellfish Waters) (Amendment) Regulations 2009 (S.I. No. 464 of 2009). The aim of the SWD was to protect or improve shellfish waters in order to promote the survival and growth of shellfish. Oysters, mussels, cockles, scallops, and clams are among the bivalve and gastropod molluscs whose aquatic environment is being protected.

In 2013 the SWD was repealed and included into the WFD. Areas used for the production of shellfish that were designated under the SWD, are protected under the WFD as 'areas designated for the protection of economically significant aquatic species' (DHLGH, 2021a). The requirement from a WFD perspective is to ensure that water quality does not impact on the quality of shellfish produced for human consumption. The same protections and parameters are afforded to shellfish waters under the

WFD but the SWD parameter of faecal coliforms was updated to the microbiological criterion *E.coli* as an indicator of faecal contamination (AAC, 2019) .

In order to maintain shellfish life and growth, the WFD Directive requires Member States to designate waters that require protection and monitor these waters against standard parameters to ensure they are maintained (DHLGH, 2021b). Tables C-40, C-41 and C-42 display the parameters of which member states need to comply for shellfish standards.

Table C-50 Shellfish Values Physical Parameters (European Parliament, 2006)

Physical	Guideline Values (G)	Mandatory Values (I)	Minimum sampling and measuring frequency
pH (pH units)		7 – 9 pH units	Quarterly
Temperature (°C)	A discharge affecting shellfish waters must not cause the temperature of the waters to exceed by more than 2°C the temperature of waters not so affected	No mandatory value set in the Directive	Quarterly
Colouration (after filtration) (mg Pt/l)		A discharge affecting shellfish waters must not cause the colour of the waters after filtration to deviate by more than 10 mg Pt/l from the colour of unaffected waters	Quarterly
Suspended Solids (mg/l)		A discharge affecting shellfish waters must not cause the suspended solid content of the waters to exceed the content in unaffected waters by more than 30%	Quarterly
Salinity (%)	12 to 38%	≤40% A discharge affecting shellfish waters must not cause their salinity to exceed the salinity of unaffected waters by more than 10%	Monthly

Table C-51 Shellfish Values Chemical Parameters (European Parliament, 2006)

Chemical	Guideline Values (G)	Mandatory Values (I)	Minimum sampling and measuring frequency
Dissolved oxygen (Saturation %)	≥80%	≥70% Should an individual measurement indicate a value lower than 70%, measurements shall be repeated An individual measurement may only indicate a value of less than 60% if there are no harmful consequences for the development of shellfish colonies	Monthly, with a minimum of one sample representative of low oxygen conditions on the day of sampling. However, where major daily variations are suspected, a minimum of two samples in one day shall be taken
Petroleum hydrocarbons		Hydrocarbons must not be present in the shellfish water in such quantities as to: - produce a visible film on the surface of the water and/or a deposit on the shellfish - have harmful effects on the shellfish	Quarterly
Organohalogenated substances	The concentration of each substance in shellfish flesh must be so limited that it contributes in accordance with Article 1 (of the Directive), to the high quality of shellfish products	The concentration of each substance in the shellfish water or in shellfish flesh must not reach or exceed a level which has harmful effects on the shellfish larvae	Half-yearly
Metals mg/l(mg/L): - Silver (Ag) - Arsenic (As) - Cadmium (Cd) - Chromium (Cr) - Copper (Cu) - Mercury (Hg) - Nickel (Ni) - Lead (Pb) - Zinc (Zn)	The concentration of each substance in shellfish flesh must be so limited that it contributes in accordance with Article 1 (of the Directive), to the high quality of shellfish products	The concentration of each substance in the shellfish water or in the shellfish flesh must not exceed a level which gives rise to harmful effects on the shellfish and their larvae The synergic effects of these metals must be taken into consideration	Half-yearly

Table C-52 Shellfish Values Other Parameters (European Parliament, 2006)

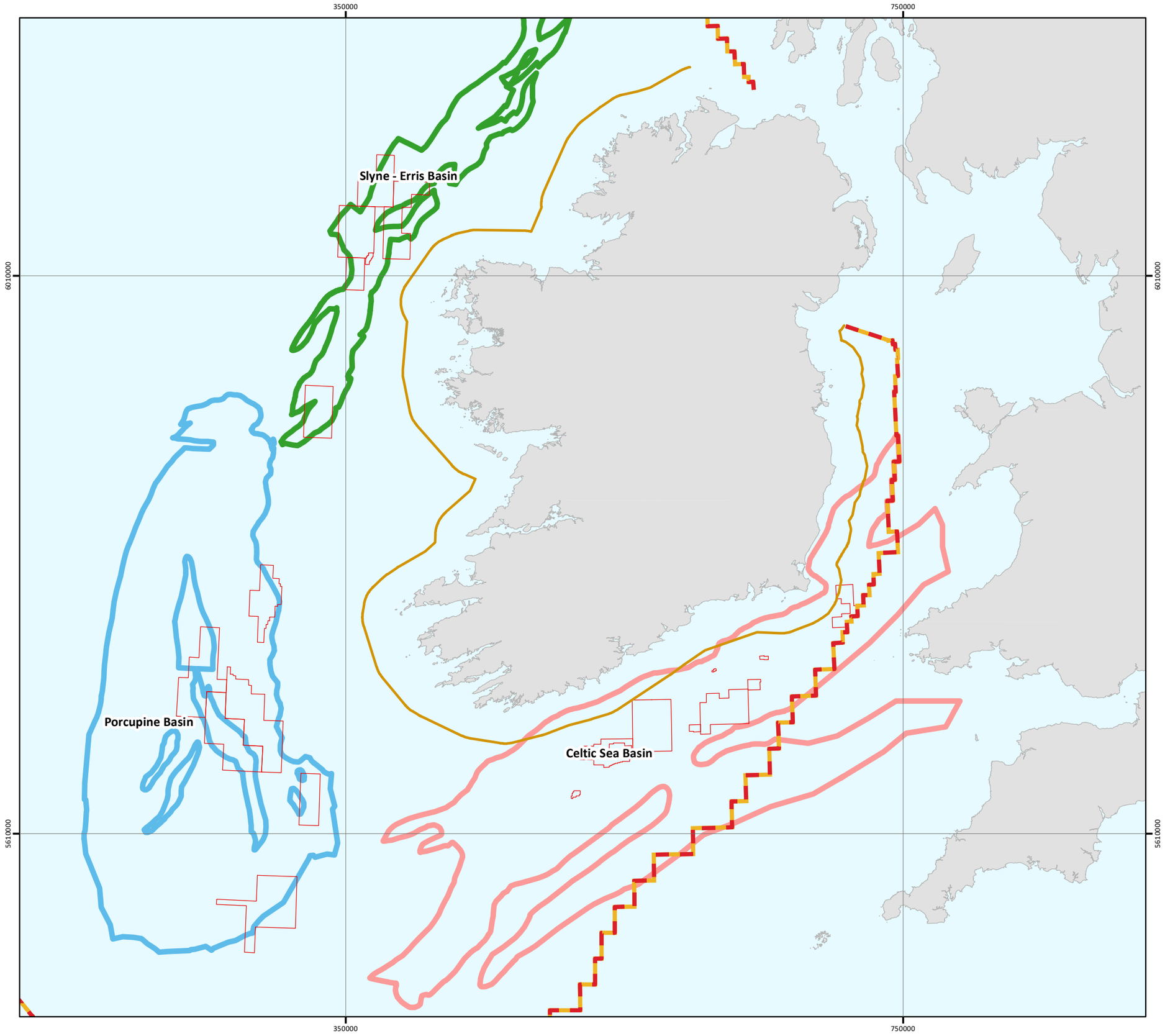
Others	Guideline Values (G)	Mandatory Values (I)	Minimum sampling and measuring frequency
E.coli (cfu/100ml)	≤230 in the shellfish flesh and intervalvular liquid	No mandatory value set in the Directive	Quarterly
Substances affecting the taste of shellfish		Concentration lower than liable to impair the taste of the shellfish	-
Saxitoxin (produced by dinoflagellates)	No limit given	No limit given	-

Designated Shellfish Waters in Ireland

Currently there are 64 sites within Ireland that are designated for Shellfish Waters (S.I. No. 268 of 2006, S.I. No. 55 of 2009, S.I. 464 of 2009) (Figure C-49, Drawing Reference: P2510-WAT-001) (DHLGH, 2021b).

Waterbodies containing designated shellfish waters are considered to be meeting their Protected Area objectives where a water quality parameter is below the concentrations given in the Regulations or where there is at least 75% compliance with the microbial guide value for shellfish based on quarterly sampling (DHLGH, 2021a).

The Marine Institute carries out assessment of shellfish waters and reported that average dissolved amounts of al metals in shellfish waters for the period 2016-2019 met environmental quality standards (DHLGH, 2021a). 82.5% of shellfish waters were compliant in terms of microbiological quality in shellfish flesh compared to the reference *E. coli* value. This was an improvement over the previous year's figure of 75% (DHLGH, 2021a).



IOSEA6 - ENVIRONMENTAL REPORT

WATER
Designated Shellfish Waters

Drawing No: P2510-WAT-001 | **B**

Legend

- IOSEA6 Area
- Designated SFW
- EEZ Boundary
- 12 NM Limit

Offshore Geological Basin

- Celtic Sea Basin
- Porcupine Basin
- Slyne - Erris Basin

N W E S

NOTE: Not to be used for Navigation

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C.9.4.3 Priority substances

As part of the WFD and the MSFD, priority substance and priority hazardous substances are monitored and physio-chemical monitoring is also undertaken. Chemical status is assessed against compliance with Environmental Quality Standards (EQS) for priority substances and priority hazardous substances (EPA, 2019b). These substances include metals, pesticides and various industrial chemicals.

Metals occur naturally in marine sediments and seawater, generally at trace levels (ng/l; OSPAR, 2000a). Many are essential components of biological processes; however, certain trace elements such as mercury, lead and cadmium are toxic at low concentrations and are of greatest concern. The concentration of naturally occurring metals in seabed sediments is closely related to sediment grain size and tends to be highest in the finest sediments accumulating in quiescent areas.

Priority Substance Monitoring

Monitoring of priority substances was carried out during the EPA 2013-2018 water quality assessment. In the years 2013-2018, 322 water bodies were sampled, including 179 river water bodies, 98 lakes, 33 transitional waters, and 12 coastal waters (EPA, 2019b). The parameters causing poor chemical status in biota were mercury, heptachlor and heptachlor epoxide (insecticides), and poly brominated diphenyl ethers (PBDEs) (flame retardants used in many manufactured goods) (EPA, 2019b). The parameter causing poor chemical status in water samples was benzo(a)pyrene, which is a polyaromatic hydrocarbon (PAH). These substances are ubiquitous in the water environment across Europe (EPA, 2019b).

A quarter of the water bodies studied (80 water bodies) are in poor chemical condition, having failed to achieve their respective EQS. Rivers contain the biggest percentage of water bodies in poor chemical condition, at 43 percent, followed by lakes (16%) and transitional waters (5.8%). Coastal waters did not have failures regarding priority substance monitoring assessments.

C.9.4.4 Hydrocarbons

Hydrocarbons occur naturally in seawater and marine sediments. Background concentrations in the marine environment are below a few mg/l and are not considered harmful to biota. Anthropogenic sources of hydrocarbons enter the marine environment from natural oil seeps and from shipping, petrochemical industries emissions, atmospheric sources and accidental releases. Riverine inputs also contribute a significant proportion of hydrocarbons entering coastal waters.

Several accidental spills have occurred within or reached IOSEA6 waters, such as oil from the Betelgeuse tanker explosion in Bantry Bay in 1979, the Kowloon Bridge ore carrier wreck off Baltimore, Co. Cork in 1986, the Sea Empress tanker spill off Milford Haven in 1996, Hickson's fire in Cork Harbour 1996, and more recently in 2009 a slick caused by a refuelling Russian warship in the Celtic Sea.

During the evaluation period of 2014 to 2018, extensive monitoring for acute pollution incidents discovered one oil spill from a ship, showing a very low impact in the MSFD area (DHLGH, 2020). While there was no estimate of volume or allegations of following harm, surveillance flights and satellite pictures were used to monitor the situation (DHLGH, 2020).

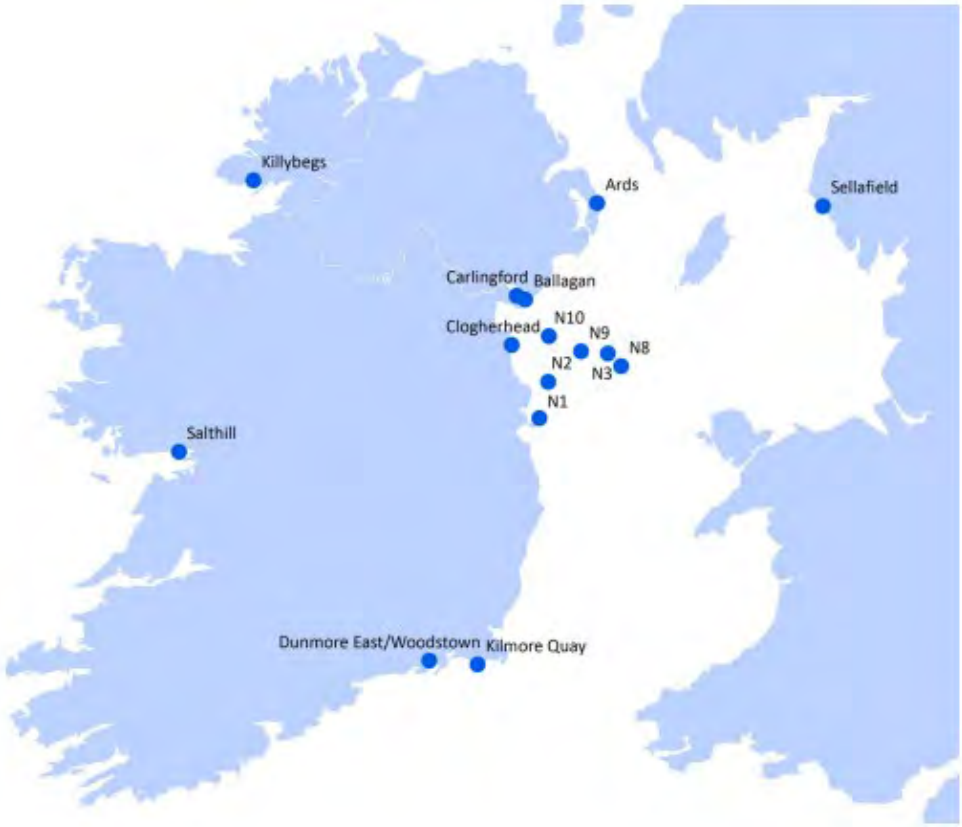
Polycyclic aromatic hydrocarbons (PAHs) are a group of organic chemicals with three or more fused benzene rings. PAHs are toxic, bio-accumulate and some are known to be carcinogens and are emitted from a wide variety of sources: notably the combustion of fossil fuel, wood preservatives and road traffic, as well as other sources including dredged materials, shipping and offshore oil and gas discharges. The two main contributors to PAHs in the environment are fossil fuels (mainly crude oil) and the incomplete combustion of organic material. Due to their hydrophobic nature PAH compounds tend to accumulate in sediments; this is particularly true of PAH compounds with a high molecular weight (OSPAR, 2004). PAH concentrations vary widely across the OSPAR regions and can reach

concentrations of 8,500ng/l in estuarine and coastal waters. Concentrations of PAHs were found to be above acceptable levels at more sites tested in OSPAR Region III (Celtic Seas) than any other.

C.9.4.5 Radionuclides

The marine environment is exposed to both natural and artificial radiation. Naturally occurring radionuclides are derived from the earths' crust and cosmic rays, artificial radionuclides are released from a range of past and present human activities including military operations and the nuclear power generation industry. Nuclear installations are the main source of radionuclide entry into the marine system in the OSPAR Celtic Seas Region III (OSPAR, 2010). The radionuclides which are used as indicator species for discharges from nuclear installations include caesium-137,technetium-99 and actinides (isotopes of plutonium and americium The most significant source of artificial radioactivity in the Irish marine environment is the discharge of radioactive waste from the Sellafield Nuclear Fuel Reprocessing Plant in Cumbria, UK (EPA, 2017). The Radiological Protection Institute of Ireland (RPII) undertakes an ongoing study of radioactivity in the marine environment and in particular relating to discharges from Sellafield (Figure C-50).

Figure C-51 Marine Sampling Location of the Radiological Protection Institute 2014-2015 study (Taken from EPA, 2017)



In the 2014-2015 the study found that levels of artificial radioactivity in the marine environment remain detectable; however, they are low and do not pose a significant risk to human health. In the marine environment radionuclides are largely restricted to the eastern area of the Irish Sea, in the immediate vicinity of Sellafield. Of the Sellafield derived caesium-137 does reach Irish waters, the majority is found on the north-east coast of Ireland in line with water circulation patterns (RPII, 2008).

The results of the analyses of caesium-137 and tritium (H-3) in coastline and offshore seawater (in the western Irish Sea) are presented in Table C-53.

Table C-53 Radioactivity in seawater 2014-2015 (Taken from (EPA, 2017)

Sampling location	Month	Concentration (Bq/l)	
		H-3	Cs-137
2014			
Ards	Jun	Nd	0.009
Ballagan	Feb	Nd	0.005
	May	Nd	0.007
	Jul	Nd	0.009
	Oct	Nd	0.005
	Mean	**-**	**0.007**
Dunmore East	May	Nd	0.001
Salthill	Jun	Nd	0.001
Irish Sea-N1	Nov	Nd	0.003
Irish Sea-N2	Nov	Nd	0.003
Irish Sea-N3	Nov	Nd	0.002
Irish Sea-N4	Nov	Nd	0.003
Irish Sea-N5	Nov	Nd	0.003
Irish Sea-N6	Nov	Nd	0.005
2015			
Ards	Sep	Nd	0.009
Ballagan	Feb	Nd	0.005
	Mar	1.4	0.005
	May	Nd	0.008
	Jul	Nd	0.008
	Sep	Nd	0.009
	Oct	Nd	0.009
	Nov	Nd	0.012
	Mean	**=**	**0.008**

C.9.5 Offshore Water Quality

C.9.5.1 MSFD Descriptor 5: Eutrophication

The MSFD considers Eutrophication of the marine environment as Descriptor 5 with GES determined when 'Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters' (DHLGH, 2020).

Under the OSPAR convention, eutrophication is defined as, “The enrichment of water by nutrients causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned and, therefore, refers to the undesirable effects resulting from anthropogenic enrichment by nutrients” (OSPAR, 2022).

This MSFD descriptor was assessed for the maritime area with three primary criteria, with OSPAR threshold values being used for assessing the offshore area (DHLGH, 2020):

- D5C1 Nutrients in the water column: Dissolved Inorganic Nitrogen (DIN), Dissolved Inorganic Phosphorus (DIP);
- D5C2 Chlorophyll a; and
- D5C5 Dissolved oxygen in the bottom of the water column.

The areas deemed to be at risk of eutrophication, according to the assessment, are mostly inshore, primarily along the eastern, south-eastern and southern coasts.

There are no signs of eutrophication in the coastal and offshore areas and trend analysis shows no rise in nutrient levels in Ireland's marine waters. Overall, 286km2 (0.05 percent of the maritime area) of Ireland's maritime region is classed as a problem area for eutrophication and it is restricted to estuary and nearshore coastal waters (DHLGH, 2020).

The updated targets for the 2020 assessment are (DHLGH, 2020):

- Environmental target D5T2: Chlorophyll a concentrations are not at levels that indicate adverse effects of nutrient enrichment; and.
- Environmental target D5T5: The concentration of dissolved oxygen is not reduced, due to nutrient enrichment.

The IOSEA6 Study Areas are within an area assessed as a ‘Non-Problem Area’ in regard to eutrophication (see Figure C-51). Overall, the offshore water quality is assessed as being in Good Environmental Status (GES) (DHLGH, 2020).

Figure C-52 OSPAR Eutrophication Assessment result in Irish Waters (2009-2014) (Taken from DHLGH, 2020))

C.9.6 Crude oil fate and behaviour during spills

Crude oils and refined products are complex combinations of hydrocarbon compounds and molecules that contain additional elements such as sulphur, oxygen, and nitrogen, as well as aromatic carbon. Crude oils and refined products are an excellent supply of carbon and energy for organisms that can use them, mostly bacteria. However, this is a long process and spilled oil is usually subjected to many physical processes before being biodegraded.

Hydrocarbons are found naturally in saltwater and marine sediments and background concentrations in the marine environment are less than a few mg/per litre and are not toxic to biota. Natural oil seeps, shipping, petrochemical industry emissions, atmospheric sources, and unintentional releases all contribute to petrogenic hydrocarbons entering the marine environment. Riverine inputs can deliver a substantial number of hydrocarbons to coastal waterways. The behaviour of oil spills in the marine environment is critical for carrying out effective first reaction measures, such as assessing whether to conduct a response at all, selecting appropriate strategy and safely carrying out clean-up operations (Dachev et al., 2020). The International Tanker Owners Pollution Federation Ltd. (ITOPF)

provides information on the oil spills and describes the individual processes of 'weathering' which describes oil behaviour (ITOPF, 2011). The weathering processes are as follows:

- **Spreading** - When oil is spilled it will immediately spread throughout the sea surface, the speed at which this occurs is determined by the viscosity of the oil and volume spilled.
- **Evaporation -** The oil's more volatile constituents will evaporate into the atmosphere. Evaporation rates are affected by ambient temperatures and wind speed. In temperate settings, oil components with a boiling point below 200°C will typically evaporate within 24 hours.
- **Dispersion** - The velocity of dispersion is mostly determined by the composition of the oil and the state of the sea, with low viscosity oils moving the fastest in the presence of breaking waves. Waves and turbulence at the sea surface can break up a slick into little droplets that mix into the upper levels of the water column.
- **Emulsification** - Many oils absorb water and form emulsions of water and oil. This can raise the volume of the pollutant by up to four times. Emulsions form most easily in oils with a combined Nickel/Vanadium concentration greater than 15ppm or an asphaltene content greater than 0.5 percent when spilled. The rate at which emulsions form is determined by the presence of these substances and sea conditions, typically greater than Beaufort Force 3 (wind speed 3–5ms-1 or 7–10 knots).
- **Dissolution** - The rate and extent to which an oil dissolves is determined by its composition, spreading, water temperature, turbulence, and dispersion degree. Lighter chemicals, particularly PAHs like benzene and toluene, are marginally soluble in sea water, but heavier components of crude oil are totally insoluble.
- **Photo-oxidation** - When hydrocarbons react with oxygen, they can produce either soluble compounds or long-lasting tars. Sunlight promotes oxidation and while it occurs throughout the spill, its overall impact on dissipation is small compared to that of other weathering processes.
- **Sedimentation and sinking** - Oil droplets dispersed in the water column can combine with sediment particles and organic debris suspended in the water column to become thick enough to sink slowly to the seabed.
- **Shoreline interaction** - The nature and size of the shoreline substrate, as well as the levels of energy to which the beach is exposed, determine how stranded oil interacts with shorelines. Oil stranding on sand shorelines causes sediment interaction, which leads to sinking. Seasonal cycles of sediment build-up (accretion) and erosion on exposed sand beaches may cause oil layers to be repeatedly buried and resurfaced. Stranded oil can be hidden by wind-blown sand even on less exposed sand beaches. If oil is carried back into near-shore seas by tidal rise and fall or storms after it has mixed with sand, it will sink.
- **Biodegradation** - A variety of marine microorganisms capable of metabolising oil molecules can be found in seawater. Bacteria, moulds, yeasts, fungus, unicellular algae and protozoa are among the organisms that can use oil as a source of carbon and energy.
- **Combined processes** – The combined effect of the individual processes is evident from the moment that the oil is spilled.

C.9.7 Ocean circulation

Ocean circulation is vital, not least to understand and inform oil spill modelling and spread of contamination and cuttings.

C.9.7.1 Irish and Celtic Seas:

Seasonality is an important factor affecting the circulation and stratification of differing water masses in the Irish Sea. Relatively high tidal velocities ensure that the majority of the Irish Sea is vertically

mixed throughout the year (Hill et al., 1992). However, waters in the western Irish Sea become stratified in spring and summer due to deep water and weaker tides (Hill et al., 1996).

Ocean circulation in the Celtic Sea and on the continental shelf is strongly influenced by the Shelf Edge Current (SEC) which flows poleward from the Bay of Biscay (IOSEA4; White & Bowyer, 1997). Current flow in the centre of the Celtic Shelf is weak and becomes stratified in summer (Fernand et al., 2006).

C.9.7.2 Atlantic Ocean:

Irish Atlantic waters fall between two major circulation features of the North Atlantic; the subpolar and sub-tropical gyres bounded by the region's major ocean currents. The North Atlantic Current (NAC) forms the southern boundary of the sub-polar gyre and heads eastwards from the western North Atlantic. The main branch of the NAC then passes north of Irish waters to the west of the Rockall Bank, with a southern branch of the NAC flowing south-east into the Bay of Biscay.

At the edge of the continental margin is a north flowing slope current which includes the relatively warm and saline SEC and below this, deep ocean circulation, with Sub-Arctic Intermediate Water (SAIW) and Labrador Sea Water (LSW) masses flowing southwards from the Arctic. Large scale eddies formed by water moving around seamounts and across rapidly changing depth contours causes variability in both upper and deep water currents. Wind induced shelf waves may also add to the variability (White & Bowyer, 1997).

C.9.8 Existing Environmental Problems

C.9.8.1 Agriculture

Agriculture spans more than 65% of Ireland's land area and is the most common substantial pressure in water bodies that aren't fulfilling their WFD targets (DHLGH, 2019). Excess nutrients and silt in water are the main issues caused by farming (DHLGH, 2019). For rivers and lakes, excess phosphorus and silt are common problems, while too much nitrogen is the main problem in estuaries and coastal waterways. In some waterbodies, too much ammonium can be an issue. These losses occur as a result of either point sources, such as farmyards, or diffuse sources, such as fertiliser and manure distribution (DHLGH, 2019).

C.9.8.2 Hydromorphology

Hydromorphological modification means change to the physical habitat conditions or a water bodies' natural functioning caused by, for example, dredging and straightening of rivers (channelisation), land drainage, or hard infrastructure such as dams, weirs, barriers, locks, embankments, culverts, piers, ports and sea walls (DHLGH, 2019). In recent years, understanding of how hydromorphological pressures affect water quality has progressed, and water quality impact evaluations are increasingly focusing on this topic (DHLGH, 2019).

C.9.8.3 Urban Runoff Pressures

Direct surface water discharges to water and storm water overflows from combined sewers are the main sources of urban runoff pressure on water quality (DHLGH, 2021a). Separated sewers that discharge rainfall could be a major conduit for contaminants like metals and plastics. The constraints on water quality are exacerbated by urban run-off, which is a mix of sewer leaks, run-off from paved and unpaved areas, and misconnections. In some areas, these effects may include the quality of bathing water (DHLGH, 2021a). Soil sealing, or the loss of soil resources owing to the covering of land for homes, roads, or other construction activities, has increased surface water runoff in metropolitan areas in recent years (DHLGH, 2021a).

Climate change will make managing urban water more difficult, particularly when it comes to coping with increasingly frequent and strong rains in urban areas (DHLGH, 2021a). As a result of the recent consultation on Ireland's Significant Water Management Issues, one of the key concerns to be included in the third-cycle of the RMBP is to improve performance in the field of nature-based sustainable urban drainage (DHLGH, 2019).

C.9.8.4 Wastewater and Fouling

Ireland's population has grown by about a quarter of a million since 2013, resulting in an increase in the volume of wastewater that needs to be treated (EPA, 2019b). Irish Water is working to improve waste water treatment across the country, however, at 120 locations, the quality of treatment is still inadequate, and raw sewage from 36 towns and villages is being dumped into rivers (5 locations) and coastal waterways (31 locations) (EPA, 2019a). Discharges of elevated concentrations of phosphorus, ammonium and nitrogen impact on the ecology of surface waters, while elevated concentrations of bacteria and pathogens impact bathing waters and shellfish waters (DHLGH, 2019).

Additionally, bathing water is impacted by poor waste management such as urban waste water and fouling from dogs on beaches (EPA, 2021a). Waste water contributed to poor quality bathing water at three beaches in 2018 (EPA, 2019a). Threats to water quality from waste water are observed from intermittent releases of untreated waste water, for example through storm water overflows or sewer misconnections, rather than problems with the treated effluent from the treatment plants (EPA, 2019a).

C.9.8.5 Nutrient Input

The EPA highlights that water quality in Ireland has improved in some areas but quality has reduced in others leading to an overall net decline in water quality since 2013 (EPA, 2019b). This decline in ecological health has been attributed to the rise in nutrients in rivers and lakes. The main issue affecting Irish waters is nutrient pollution (nitrogen and phosphorus) that can induce excessive plant growth and increase the likelihood of dangerous algal blooms. In the south, excessive nitrogen has a negative influence on estuaries and coastal waterways. Losses to the maritime environment are high and increasing in the south-east of the country (EPA, 2019b). The soils in these locations are particularly free-draining and highly sensitive to nitrogen leaching from intensive agriculture (EPA, 2019b). Nitrate losses in these locations are tightly tied to farming intensity; the more nitrogen applied to land, the higher the nitrate concentrations in associated waters. Since 2013, nitrogen emissions have grown due to an increase in both cattle numbers and fertiliser use (EPA, 2019b). In these locations, nitrogen loss reduction strategies must be focused by enhancing nutrient usage efficiency and minimising the use of chemical fertilisers (EPA, 2019b).

Phosphorus has been highlighted as another concern for estuarine water (EPA, 2019b). Phosphorus levels are high in several areas of the country, including the north-west, north-east, east coast, south-east and south of the Shannon Estuary. Waste water discharges and runoff losses from agriculture on poorly draining soils are the main sources of phosphorus losses (EPA, 2019b).

C.9.8.6 Aquaculture

Aquaculture is a growing practise in Ireland, and with this process becoming more common, it presents a number of environmental problem's to water quality. Aquaculture requires a significant amount of fish feed in order to farm carnivorous species such as salmon. Waste from fishfeed often ends up polluting the waters surrounding the aquaculture sites, and contaminates the seabed sediment (Sustain, 2022). Aquaculture can often affect water filtration in sensitive coastal areas were aquaculture sites are commonly established.

C.9.9 Potential Sensitivities to the plan

A summary of the potential pressures and sensitive aspects of the topic are displayed in Table C-54.

Table C-54 Summary of potential pressures of the Plan on Water Quality

Plan activity	Aspect	Pressure	Sub-Topic	Key sensitivities
Seismic survey and drilling	Marine discharges (normal operations / drill rigs)	Deterioration of water quality	Coastal and transitional water quality Offshore water quality	Release of routine vessel discharges and wastes to the water may have a direct effect on the water quality. Impacts on water quality would indirectly impact ecology, recreation value (particularly bathing waters if sewage is discharged), and also have potential impacts for human health (via food uptake routes).
Seismic survey	Accidental events (e.g. loss of cable oil, diesel, equipment, collision)	Deterioration of water quality	Coastal and transitional water quality Offshore water quality	Release of diesel, chemicals etc. to the water, with a direct effect on the water quality. Impacts on water quality would indirectly impact ecology, recreation value, and also have potential impacts for human health (via food uptake routes).
Drilling	Presence of subsea equipment (including wellhead, anchors and chains etc)	Localised Turbidity increases	Ocean circulation	Potential effects may occur as a result of e.g. anchor chain movement causing localised disturbance to sediments resulting in localised increase in turbidity in the water column. However the likelihood of a significant effect through this route is considered to be low.
Seismic survey and drilling	Accidental events (e.g. loss of diesel, chemicals, base oil; worst case scenario - blowout)	Hydrocarbon & PAH contamination	Coastal and transitional water quality Offshore water quality Crude oil fate and behaviour during spills	Release of diesel, chemicals etc. to the water, with a direct effect on the water quality. Impacts on water quality would indirectly impact ecology, recreation value, and also have potential impacts for human health (via food uptake routes). If a large scale blowout occurred these effects may be major.
Drilling	Potential discharges from commissioning of drill rigs	Deterioration of water quality	Coastal and transitional water quality Offshore water quality	Release of oil and chemicals etc to the water, with a direct effect on the water quality. Impacts on water quality would indirectly impact ecology, recreation value, and also have potential impacts for human health (via food uptake routes).
Drilling	Mud, cement and cuttings release from tophole sections and WBM & WBM contaminated cuttings discharge from surface, including payzone cuttings	Water contamination	Coastal and transitional water quality Offshore water quality	Release of mud, cement and cuttings, oil, chemicals etc. to the water may have a direct effect on the water quality. Impacts on water quality would indirectly impact ecology, recreation value, and also have potential impacts for human health (via food uptake routes).

Plan activity	Aspect	Pressure	Sub-Topic	Key sensitivities
Drilling	Well testing (flaring)	Hydrocarbon & PAH contamination	Coastal and transitional water quality	Release of diesel, chemicals etc to the water, with a direct effect on the water quality. Impacts on water quality would indirectly impact ecology, recreation value, and also have potential impacts for human health (via food uptake routes).
			Offshore water quality	
Drilling	Drilling Activity	Deterioration of water quality	Coastal and transitional water quality	Release of oil and chemicals etc to the water, with a direct effect on the water quality. Impacts on water quality would indirectly impact ecology, recreation value, and also have potential impacts for human health (via food uptake routes).
			Offshore water quality	
Seismic survey and drilling	In-combination effect		Coastal and transitional water quality	The impacts of these should account for cumulative impacts from other industries (e.g. fishing, ferries etc)
			Offshore water quality	

C.9.10 Data Gaps

Table C-55 Summary of data gaps in topic Water Quality

Section	IOSEA5 identified data gap	Update for IOSEA6	IOSEA6 Data Gap	Availability of other datasets
Contaminants of interest	At present very minimal data on water quality exists for offshore waters, making any assessment of effects from oil and gas exploration difficult.	The MSFD, WFD and water quality reports have been produced and focus on contaminants.	Since most sources are terrestrial and marine sources are generally more concentrated in coastal waters, the Marine Institute's national monitoring for hazardous substances is risk-based and predominantly focused on coastal seas (e.g. shipping converging around ports). Monitoring is not routinely extended outside Irish coastal waters if problems are not discovered in inshore waters. unless there is a specific risk, such as specific offshore sources.	The WFD, MSFD and water quality reports are reviewed every six years. The RBMP is also under review. Data which is collected for these reports can all be used to inform future baselines.
Coastal and transitional water quality		The MSFD, WFD and water quality reports have been produced and focus on contaminants.		The draft RMBP (2022-2027) plan states that; Urban waste water discharges in the vicinity of shellfish waters are being assessed to determine if they are contributing to water quality failures. These assessments can be used in any future baseline of Shellfish Water Quality. The Sea fisheries Protection Authority is another possible data source to gain data on coastal and transitional water quality.
Offshore water quality		The MSFD, WFD and water quality reports have been produced and provides information on some factors of offshore water quality.		The WFD, MSFD and water quality reports are reviewed every six years. The RBMP is also under review. Data which is collected for these reports can all be used to inform future baselines.

Section	IOSEA5 identified data gap	Update for IOSEA6	IOSEA6 Data Gap	Availability of other datasets
Crude oil fate and behaviour during spills		Modelling of crude oil spills from certain offshore areas has been produced and will be used to further inform the IOSEA6 assessments.		
Ocean circulation				

C.9.11 Predicted future baseline for the topic

The MSFD and WFD monitoring programmes will be ongoing as compliance is required under the Directives. Updates to these assessments will provide more comprehensive assessment of the baseline water quality in the future to determine potential impacts of oil and gas operations.

GES of sites will continue to be aimed for and as such, site classifications can change under the monitoring scheme. To continue with improvements, the RBMP, will continue to be updated and adhered to and Irish Water has plans in place to improve infrastructure which will affect the future baseline of water quality.

The potential wastes and discharges produced by the oil and gas industry offshore are regulated by a suite of regulations and plans, seeking to limit the impact of those activities and operations, which seek to limit the impact. Reductions in emissions have been seen in recent years and may continue in the future, however, this will need to validated through assessment and monitoring.

Cumulative impacts from other industries in the area will in the future affect the water quality of the area. These impacts on water quality must be incorporated when assessing the future baseline.

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