



MILFORD HAVEN WATERWAY
ENVIRONMENTAL SURVEILLANCE GROUP

GRŴP CADW GOLWG AMGYLCHEDDOL
AR DDYFRFFORDD ABERDAUGLEDDAU



Annual Report 2022



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COVER IMAGE

Front cover: Winter waders (Bar-tailed Godwit in background and Redshank in foreground).
Photo: Mike Camplin

MILFORD HAVEN WATERWAY ENVIRONMENTAL SURVEILLANCE GROUP

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Pembrokeshire County Council
Port of Milford Haven
Puma Energy Ltd
RWE Generation UK plc
South Hook LNG Terminal Company LTD
Valero Energy Ltd
Valero Pembrokeshire Oil Terminal Ltd
Neyland Yacht Haven Ltd

Contact the MHWESG by e-mail at
mhwesg@gmail.com or see <https://www.mhwesg.org.uk/>

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 UK Marine Monitoring and Assessment: Clean and Safe Seas Evidence Group
 Dwr Cymru-Welsh Water
 EA Environmental Monitoring and Assessment, Peterborough
 Pembrokeshire Marine SAC officer
 Skomer MCZ personnel in NRW
 Skomer MCZ Advisory Committee Chair

**Milford Haven Waterway Environmental Surveillance Group
Report 2022**

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Chair's Foreword

2022 is the year most of us will remember for that hot and prolonged summer of no rain, where 'Climate Change' as a topic of conversation was heard more regularly in the media, in homes and the work-place. It is at times like these that long term datasets, such as those gathered through the MHWESG, come in to their own. The group has been established now for at least 30 years, with the intention to continue for at least another 30, collecting data that will be a valuable reference for documenting changes in the natural environment through climate change.

2022 was a relatively quiet year in terms of field work for the Group. But this belies the work that continued steadily throughout the year in preparation for a busy 2023 when the Group hope to embark on a one-off project to collect isotope dated cores to uncover the ever-evolving human use of the Milford Haven Waterway over the past 150 years. This is a significant and novel project for MHWESG and I am looking forward to seeing what emerges in the coming year. Watch this space!

Paul Howells, Dragon LNG Ltd

Chair MHWESG

Cyflwyniad y Cadeirydd

Bydd y rhan fwyaf ohonom yn cofio 2022 fel blwyddyn yr haf hirfelyn tesog a sych pan oedd 'Newid Hinsawdd' yn destun sgwrs mwy rheolaidd ar y cyfryngau, mewn cartrefi ac yn y gweithle. Ar adegau fel hyn y mae setiau data hirdymor, fel y rhai a gasglwyd drwy MHWESG, yn dod i amlygrwydd. Mae'r grŵp wedi'i sefydlu bellach ers o leiaf 30 o flynyddoedd gyda'r bwriad o barhau am o leiaf 30 mlynedd arall yn casglu data fydd yn gyfeirnod gwerthfawr ar gyfer dogfennu newidiadau yn yr amgylchedd naturiol oherwydd newid hinsawdd.

Roedd 2022 yn flwyddyn gymharol dawel i'r Grŵp yn nhermau gwaith maes. Er hynny, parhaodd y gwaith yn gyson drwy gydol y flwyddyn er mwyn paratoi at 2023 brysur pan mae'r Grŵp yn gobeithio dechrau ar brosiect unwaith mewn oes i gasglu creiddiau isotop wedi'u dyddio er mwyn datgelu defnydd cyson a chynyddol pobl o Ddyfrffordd Aberdaugleddu dros y 150 o flynyddoedd diwethaf. Mae hwn yn brosiect newydd ac unigryw i MHWESG ac rwy'n edrych ymlaen at weld beth a ddatgelir yn ystod y flwyddyn. Cadwch lygaid barcud ar yr hyn sy'n digwydd!

Paul Howells, Dragon LNG Ltd

Cadeirydd MHWESG

1. Introduction

This annual report marks the 32nd year of the Milford Haven Waterway Environmental Surveillance Group, covering the period from January to December 2022.

In a review of the 30 year shelduck dataset a few years ago, the British Trust for Ornithology (BTO) recommended that additional information should be extracted retrospectively from 3 decades of shelduck field notes and reports. The BTO also recommended reformatting the shelduck data archive to better facilitate data analysis. Both these exercises were completed this year. The annual shelduck survey report in Section 2.1 is the first year following a new report format and data archive method, both of which have proven to make data validation and data archiving simpler.

Documentation of methods used for each of the MHWESG's long-term surveillance projects is important if data comparability is to be preserved over time. For this reason, a contract was let to document the method used for the annual summer shelduck populations surveys. This includes survey preparation, field work, data entry and also information on shelduck use of the Milford Haven Waterway (section 2.2).

Section 2.3 includes a synthesis of information on wetland birds in the waterway over the last 3 years. This information is also presented in the context of the status of wetland birds in the UK and elsewhere.

Brief descriptions of quadrat maintenance of rocky shore quadrat markers and review of the Knowledge Collaboration Agreement are to be found in Sections 2.4 and 2.5 respectively.

More general information on the MHWESG and summaries of reports are available at <http://mhwesg.org.uk>. Full reports for all MHWESG commissioned work are available from mhwesg@gmail.com.

2. MHWESG projects 2022

2.1 Daugleddau Estuary and Milford Haven Waterway: annual surveillance of summer shelduck populations 2022

Jane Hodges, Ecologist

Executive summary

The Daugleddau Estuary and Milford Haven Waterway hold regionally important numbers of shelducks during the winter months. There is also a small summer population that has been the subject of annual surveillance between 1991 and 2021. In 2022, the annual surveillance of summer shelduck populations was repeated as part of a programme of environmental surveillance work in the estuary system coordinated by the Milford Haven Waterway Environmental Surveillance Group (MHWESG).

The aims, objectives and methods used to carry out the annual surveillance, and the data obtained, are described in this report.

The total number of broods seen in the estuary system during the 2022 annual surveillance was ten, four fewer than in 2021 (which was, along with the 2019 breeding season, the best since 2006), and it was the lowest number of broods recorded during the surveys since 2017 (when seven broods were recorded). Since 2018, the number of broods seen in the estuary system during the annual surveillance has fluctuated between 10 and 14, and no clear upwards or downwards trend has emerged during this period.

The overall mean brood size was marginally higher in 2022 than it was in the preceding four seasons.

As in previous years, predation (by avian and/or mammalian predators) is likely to have been a (or the most) significant factor affecting the number and sizes of broods recorded in the estuary system during the 2022 surveys. Adverse weather conditions (e.g., heavy rain accompanied by low temperatures) in late April, May and June can impact on the survival of eggs to hatching and/or recently hatched ducklings. In 2022, however, it is very unlikely that the weather conditions during the spring (April-June) had any significant impact on nesting shelducks, the number of ducklings that managed to make it onto the water after leaving their nests or the survival of young once they had reached the water.

Disturbance e.g., from recreational activities (on land and/or on the water) may also affect breeding success and subsequent survival of young. Levels of recreational activity on the Milford Haven Waterway in 2022 were significantly higher than pre-pandemic levels, especially paddle-boarding and kayaking (the latter being an activity that takes place in the upper, quieter reaches of the Daugleddau Estuary). Given the relatively high levels of waterborne recreation in the summer 2022, it is perhaps inevitable that there will have been some interaction between recreational users and wildlife. However, there were no reports or documented evidence of disturbance of shelducks as a consequence of waterborne recreational activities in the estuary system in 2022.

Other factors such as the extent and quality of foraging habitat may have affected the survival and development of the young in parts of the estuary system. These are, however, not known or understood.

The number of non-breeding shelducks seen in June 2022 was 52, nearly twice the number seen in 2021. It is highly likely that the increase in the numbers of non-breeders present in spring is directly linked to the much higher numbers of shelducks present in the estuary system in the late winter of 2021/22 than in the previous few years.

Data collected for other wetland birds once again underlined the importance of the estuary system during migration, especially for species such as curlew.

The report concludes with a recommendation that the annual surveillance of the summer shelduck population in the estuary system be continued as part of the MHWESG's annual work programme. In addition to this recommendation, potential lines of inquiry into the distribution and abundance of the favoured prey of shelducks (the mud snail *Peringia ulvae*) and links to factors affecting environmental conditions in the estuary system are identified for further consideration by the MHWESG and/or individual group members.

2.2 Shelduck data extraction, data archive reformat and production of a method statement for the annual summer shelduck survey

Jane Hodges, Ecologist

Following a recommendation by the British Trust for Ornithology (Green et al., 2020), additional data was extracted retrospectively from field notes and reports for the shelduck survey between 1992-2021. This information included dates for each data record and also the number of adults accompanying each brood.

The British Trust for Ornithology also recommended reformatting the Excel database used to archive the shelduck data into a format that would be compatible with statistical analysis software e.g. 'R'.

A comprehensive method statement for the annual shelduck survey was documented by the shelduck surveyor. This includes information on all stages of the annual summer shelduck surveys, i.e. survey preparation, methods for boat and land surveys, data entry, data archiving and data reporting. The method statement also provides an outline of the ecology and demographics of the shelduck in the estuary system, a glossary of terms, in particular for the various age and breeding status of shelduck.

The method statement is sufficiently detailed to allow other future ornithological surveyors to carry out the surveys to the same method and standard as is currently used.

Reference

Green, R. M. W., Burton, N. H. K. and Cook, A. S. C. P. 2020. *A review of shelduck data (1992-2019) for the Milford Haven Waterway, Pembrokeshire*. A report to the Milford Haven Waterway Environmental Surveillance Group

2.3 A review of the status of wetland birds in the Milford Haven Waterway and Daugleddau Estuary, 2022

Annie Haycock, Pembrokeshire WeBS Coordinator

Executive Summary

The Milford Haven Waterway - Daugleddau Estuary system (“the estuary system”) is an important wintering ground for waders and wildfowl because of its sheltered location and open mudflats.

The estuary system is of international importance by virtue of hosting an average of over 20,000 waterbirds of around 60 species each winter. It is of (UK) national importance for its populations of wintering pale-bellied Brent geese, wigeon, dunlin and greenshank. It ranks in the top five sites in Wales for shelduck, teal, golden plover, lapwing, snipe, black-tailed godwit, curlew, redshank, grey heron, little egret, and little grebe.

The estuary system holds some 14.5% of the Welsh waterbirds (on WeBS sites) in mid-winter, and just under 1% of the UK waterbirds counted on WeBS sites.

- **Light-bellied Brent Geese** breeding in the Canadian Arctic include the estuary system in their wintering/migration sites. Nationally important numbers are regularly found commuting between the Gann and Angle Bay.
- Almost all the **shelduck** in Pembrokeshire in winter are found on the estuary system. Numbers of wintering shelduck have fallen, both here and across the UK. Breeding success fell to an all-time low in 2012, but has recovered slightly.
- **Wigeon** numbers have increased dramatically since 2003, particularly on Pembroke River and Angle Bay. They move on, either to other parts of the estuary system or out of the estuary system altogether, as soon as one of their main food resources (*Zostera*) is exhausted in mid-winter.
- **Teal** numbers have fluctuated over the past decade, thought to be caused by the recent run of mild winters and an increase in the number of protected areas on mainland Europe allowing larger numbers of birds to remain further north and east.
- Mid-winter peak counts of **Curlew** have decreased on the estuary system, and in both the UK (33% decline in 25 years) and Europe in general. However, data indicate that the estuary system is still an important migratory stop-over for curlew.
- **Greenshank** numbers have increased following a period of low counts in the 1990s. The estuary system is one of the top fifteen wintering sites for this species in the UK, and almost half of the birds wintering in Wales are found here.
- The **Canada goose** population rose considerably in the 1990s, in line with the trends for the Welsh and the UK populations. Birds are most often found between Llangwm and Boulston, although they also feed away from the estuary. There is no clear evidence yet that they are affecting the numbers or distribution of other bird species, however, they may have an effect on the flora through trampling and eutrophication.

- **Greylag geese** were rarely recorded on the estuary system before 2005, but have since increased to over 100 (max 140 in 2018-19). There is increasing evidence of them breeding locally, and they may or may not be a future cause for concern.
- **Grey herons** breed at three main sites on the Cleddau estuary system, totalling around 15 nests each year in the 1990s. Numbers of nests appear to have declined, however, counts are sporadic and no conclusions can be drawn about the breeding population.
- Although **little grebes** no longer reach numbers of National Importance on the estuary system, 14% of the Welsh wintering population (on WeBS sites) are found here, and it is the fifth-most important site in Wales for them.

Most of the changes in bird populations on the estuary system are reflected at other sites, either in Wales or in the UK as a whole. For example, some of the observed changes in numbers using the estuary system in winter may reflect the run of mild winters between 1995 and 2009 (which may or may not suggest long-term climate change), so birds do not have to travel so far south and/or west to escape harsh winter weather. Data suggest that large numbers of birds are more likely to visit the estuary system during periods of extreme weather, but during normal weather would prefer the conditions (including a better food supply) on the east coast.

Winter distribution may also be affected by the increase in protected areas on the European mainland, which have resulted in birds, eg teal, that are susceptible to hunting pressure, to remain in those areas.

Counts done at low tide in 1997-98, 2005-06 and 2013-14 show the main feeding areas for most species to be Pembroke River, Angle Bay, Fowborough Point, Carew River and Gann Estuary.

Incidental data collected during annual breeding shelduck surveys in June/July and early August since 1992 have demonstrated the importance of the estuary system as a migration stop-over for several additional species, notably curlew.

The Cleddau estuary system continues to be of international importance for wintering and migrating wetland birds, and it is vital that the full range of their requirements (eg undisturbed good quality feeding habitat and high tide roosts) continue to be met here.

Why do we need to keep counting?

Annual monitoring will pick up trends in the numbers of birds at local and national levels, and will flag up changes that may require further consideration or investigation (eg water quality and recreational use) in the estuary system.

For example, in winter 2012-13 the wigeon arrived in September as usual, but left early, with the peak count some 3000 less than in previous winters. The peak count was 1200 lower still in 2013-14 but recovered in the two subsequent winters. Since 2018-19, a greater proportion have been using Angle Bay. These may be one-off or short-term events; they may have been caused by events away from the estuary; there may have been some disturbance that kept the birds away, or it may indicate some (temporary) change in the food supply in Pembroke River and Angle Bay.

Redshank numbers dropped by half in the early 1990s but have been reasonably stable since then. This is part of a national/international trend affecting other west coast estuaries.

Low tide counts are undertaken only every eight years or so. The 2013-14 counts indicated a considerable drop in dunlin numbers feeding on the mudflats. This was consistent with the regular high tide counts in that season. However, the annual monitoring showed that this was a one-off low season that affected all sites around Britain.

Long-running datasets are very rare but are extremely valuable in picking up both long-term and short-term changes. It is therefore important to continue with annual surveillance of wetland birds within the estuary system, both as part of the UK dataset and in terms of SSSI monitoring.

The effect of the Covid19 pandemic on the regular counts

Covid19 human movement restrictions came into force in late March 2020. This was after the date of the March 2020 WeBS count, so there was no effect in that season.

Surveillance of breeding shelduck in summer 2020 was affected, as the proximity of people on the boat was against the rules. Counts were done as far as possible from the land.

Covid restrictions had been relaxed in time for the September to December 2020 WeBS counts, but came into force again in January. These restrictions meant that several counters were not able to reach their regular sectors. However, regular counters living close to the estuary, plus a few other volunteers were able to cover all the major sectors except the Western Cleddau upstream of Little Milford and Angle Bay. The species totals suggest that a reasonable January count was achieved.

The BTO suspended all counts in February, and although restrictions were lifted somewhat by March, no counts were done then either. However, as most species peak counts occurred before February, meaningful data was still obtained for the season.

Normal counts were resumed for the 2021-22 season.

The lack of data from much of Britain during the 2020-21 season has meant that national peak counts and indices could not be calculated (Frost & Calbrade 2022). In this report, therefore, comparisons with the national picture can be made only until the 2019-20 season. 2021-22 data will not be available until spring 2023.

Numerical summary of importance

Most recent figures from the BTO website.

Species	Cleddau 5-year average (2015/16 – 2019/20)	UK threshold for national importance	Cleddau rank in a Welsh context
Wigeon	6555	4500	1
Greenshank	36	8	2
Dunlin	3788	3400	4

Light-bellied Brent	78	7	5
Curlew	1071	1200	4
Shelduck	368	470	7
Teal	2291	4300	2
Golden Plover	3514	4000	1
Little Egret	56	110	4
Little Grebe	27	150	5
Grey Heron	27	500	4
Lapwing	4810	6200	1
Snipe	137	10,000	4
Black-tailed Godwit	184	390	4
Redshank	688	940	5
Lesser Black-backed Gull	410	1200	4

2.4 Maintenance of intertidal rocky shore markers

The intertidal rocky shore survey is scheduled to occur every 3 years. This survey involves repositioning quadrats at the same position at 6 different locations in the Milford Haven Waterway – Dale Point, Gelliswick, Llanreath, Cosheston Folly, Great Castle Head and Sawdern Point.

Quadrats are repositioned using 'permanent' fixed markers in the form of stainless steel bolts and large screws. In the 3 years between each survey, these markers can become overgrown with marine life and difficult to spot. They can also become dislodged for a number of reasons.

A contract was let this year to maintain these markers approximately mid-way between scheduled surveys as this allows the surveyors to make best use of tidal windows to undertake the surveys rather than spend time locating and maintaining quadrat markers.

This work was carried out during the summer, and quadrat relocation notes updated accordingly.

2.5 MHWESG Knowledge Collaboration Agreement

In 2015 the MHWESG's Memorandum of Agreement was out of date, as the majority of the members had been subject to name changes, dissolution or merging, and no longer reflected the actual membership. Over the next two years, a comprehensive 'Collaboration Agreement' was negotiated with between members' legal representatives. This agreement outlined the governance and *modus operandi* of the Group, providing a framework for the MHWESG to operate within and addressing details such as financial management, liability and intellectual property rights etc. The first iteration of the Collaboration Agreement was signed by MHWESG members in January 2017.

Section 16.1 of this Collaboration Agreement states *'This Agreement will be subject to full review and reaffirmation at five yearly intervals from the date of the Agreement.'*

Following a review exercise, the Collaboration Agreement was resigned by members in January 2022. This version of the Collaboration Agreement will underpin the MHWESG work going forward (see Appendix 2 for revised version).

3. Work programme 2023

It is anticipated that the annual shelduck survey and synthesis of wetland birds report will go ahead in 2023.

The intertidal rocky shore survey is scheduled to occur in 2023. It is also anticipated that the project involving isotope dating of cores will also progress in the coming year. As with all projects, whether these go ahead is subject to there being sufficient funds available.

Appendices

Appendix 1: Purpose and terms of reference

The Milford Haven Waterway¹ is an extensive natural inlet of the sea with a long and distinguished maritime history. Its deep waters provide a natural harbour of significant economic importance. It is one of the best examples of a ria system in Britain and supports a particularly diverse range of high quality marine and estuarine habitats and biological communities.

The identification and consideration of political and management issues or the setting of environmental standards are specifically excluded from these Terms of Reference. However, group members are free, and are expected to use the group's outputs to help meet their own requirements.

Purpose

To provide high quality environmental information to enable members of the Group, and other authorities and industry working in and adjacent to the Waterway, to contribute to the maintenance and enhancement of the rich and diverse marine environment of the Waterway.

Terms of Reference

The Milford Haven Waterway Environmental Monitoring Steering Group will:

1. Maintain surveillance of the quality of the marine physico-chemical environment, marine biology and ornithology of the Milford Haven Waterway
2. Undertake surveillance of the foreshore, seabed and waters of the Milford Haven Waterway from a line between St Anne's Head and Sheep Island to the tidal reaches of the Eastern and Western Cleddau Rivers and other tributaries to normal tidal limits by:
 - 2.1 keeping under review all relevant survey, surveillance and monitoring;
 - 2.2 commissioning surveys to fill gaps in knowledge and to establish baselines;
 - 2.3 undertaking surveillance projects;
 - 2.4 maintaining a literature and information database.
3. Jointly maintain, and keep under review, a prioritised programme of survey and surveillance projects.
4. Share technical output equally under joint ownership and copyright.
5. Function as a technical, science based, group.
6. Form and appoint specific sub-groups to undertake specific responsibilities as required.

¹ The term Waterway in this document specifically refers to the waters, seabed and foreshore of the Milford Haven Waterway and the Daugleddau Estuary from a line between St Anne's Head and Sheep Island to the tidal reaches of the Eastern and Western Cleddau Rivers and other tributaries to normal tidal limits.

7. Publish an annual report which will comprise a summary of work undertaken, the executive summaries from individual project reports, a financial statement and the planned work programme.
8. Make its output available to the wider community in addition to its membership.

Membership and Funding

Membership is comprised of statutory authorities, industry and others with an interest in the environmental quality of the Waterway. Membership will be at the invitation and discretion of the Group's existing members.

Each member will contribute to the functioning of the group, either in monetary terms or 'in kind'.

Appendix 2: Milford Haven Waterway Environmental Surveillance Group Knowledge Collaboration Agreement



Dated: 12 January 2022

DRAGON LNG LIMITED

MILFORD HAVEN PORT AUTHORITY

NATURAL RESOURCES WALES

PEMBROKESHIRE COAST NATIONAL PARK AUTHORITY

PEMBROKESHIRE COUNTY COUNCIL

PUMA ENERGY (UK) LTD

RWE GENERATION UK PLC

VALERO PEMBROKESHIRE OIL TERMINAL LTD

SOUTH HOOK LNG TERMINAL COMPANY LTD

VALERO ENERGY LTD

PEMBROKESHIRE COASTAL FORUM

NEYLAND YACHT HAVEN LTD

Knowledge Collaboration Agreement
relating to the Milford Haven Waterway Environmental Surveillance Group
12 January 2022 (Issue 3)

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Issue 1 of this Agreement was made on the 17th day of January 2017.

Issue 2 of this Agreement was made on the 6th day of August 2019 with update to members details only.

Issue 3 of this Agreement was made on the 12th day of January 2022 as part of a 5 year review.

BETWEEN:

DRAGON LNG LIMITED, a company incorporated in England and Wales, Registered Number

04562711, whose registered office is at Main Road, Waterston, Milford Haven, Pembrokeshire, SA73 1DR;

MILFORD HAVEN PORT AUTHORITY, a Trust Port, whose Head office is at Gorsewood Drive, Hakin, Milford Haven, Pembrokeshire SA73 3EP;

NATURAL RESOURCES WALES, a Welsh Government Sponsored body, whose office is at Ty Cambria, 29 Newport Road, Cardiff CF24 0TP;

PEMBROKESHIRE COAST NATIONAL PARK AUTHORITY, a special purpose authority, whose office is at Llanion Park, Pembroke Dock, Pembrokeshire SA72 6DY;

PEMBROKESHIRE COUNTY COUNCIL, a Multi-purpose local government authority, whose head office is at County Hall, Haverfordwest, Pembrokeshire. SA61 1TP;

PUMA ENERGY (UK) LIMITED, a company incorporated in England and Wales, Registered Number 09156625, whose registered office is at: Westerleigh Terminal, Oakleigh Green, Farm Lane, Westerleigh, Bristol BS37 8QE;

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SOUTH HOOK LNG TERMINAL COMPANY LTD, a company incorporated in England and Wales, Registered Number 04982132, whose registered office is at Dale Road, Herbrandston, Milford Haven, Pembrokeshire, SA73 3SU;

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PEMBROKESHIRE COASTAL FORUM, a company incorporated in England and Wales, Registered Number 8447094; whose registered office is at Pier House, Pier Road, Pembroke Dock, Pembrokeshire, SA72 6TR;

and

NEYLAND YACHT HAVEN LTD, a company incorporated in England and Wales, Registered Number 02751404; whose registered office is at King's Saltern Road, Lyminster, Hampshire, SO41 3QD.

PREAMBLE

The Milford Haven Waterway is an extensive natural inlet of the sea with a long and distinguished maritime history. Its deep waters provide a natural harbour of significant economic importance as a port handling strategic energy resources and ferry services sustaining many valuable long-term jobs in Pembrokeshire. It is one of the best examples of a ria system in Britain and supports a particularly diverse range of high quality marine and estuarine habitats and biological communities.

RECITALS

- (A) The Group Members agree to work collaboratively in a non-binding knowledge collaboration as the **Milford Haven Waterway Environmental Surveillance Group** in order to provide high quality environmental information to the Group Members, so enabling the Group Members to contribute to the maintenance and enhancement of the rich and diverse marine environment of the Waterway whilst sharing this information with the local and scientific communities, and to perform the objects set out in clause 3.2.
- (B) This Agreement serves to continue the successful collaborative Milford Haven Waterway Environmental Surveillance Group that began with establishment of the Milford Haven Waterway Environmental Monitoring Steering Group in 1991 and resulted in a Memorandum of Agreement being entered into by the members of the Group on 1 July 2004.
- (C) The Memorandum of Agreement has gradually been overtaken by time and is now recognised as being insufficiently flexible for an evolving membership.
- (D) Accordingly, on the date of Issue 1 of this Agreement the Group Members have agreed to terminate the Memorandum of Agreement on the basis that the Group would be reconstituted as a non-binding knowledge collaboration Group in order to continue fulfilling the Objects of the Group.
- (E) Consequently, the Group Members have agreed to enter into this Agreement on the terms and conditions set out below.

The Group Members agree as follows:

1. INTERPRETATION

- 1.1 In this Agreement, unless there be anything in the context inconsistent therewith the following expressions shall have the following meanings:

“**Committee**” has the meaning ascribed to it by clause 4.1;

“**Group**” means the Milford Haven Waterway Environmental Surveillance Group reconstituted under Issue 1 of this Agreement and any agreement supplemental to it;

“**Group Members**” means all of the parties listed on pages 3-4 of this Agreement and Group Member shall have a corresponding meaning;

“**Intellectual Property**” means all intellectual property rights of whatever nature including without limitation copyright, patents, know-how, trade secrets, trademarks, trade

names, design right, get-up, database right, utility models, service rights, moral rights, domain names and all similar rights and, in each case:

- (a) whether registered or not;
- (b) including any applications to protect or register such rights and the right to make such applications;
- (c) including all renewals, continuations and extensions of such rights or applications;
- (d) whether vested, contingent or future; and
- (e) wherever existing;

“IP Rights” all rights which may now or in the future subsist in respect of or derived from any Intellectual Property.

“Memorandum of Agreement” means the Memorandum of Agreement dated 1 July 2004 entered into between the parties;

“Objects” means the objects of the Group itemised in clause 3.2;

“Waterway” means the waters, seabed and foreshore of the Milford Haven Waterway and the Daugleddau Estuary from a line between St Anne’s Head and Sheep Island to the tidal reaches of the Eastern and Western Cleddau Rivers and other tributaries to the normal tidal limits.

2. TERMINATION OF THE MEMORANDUM OF AGREEMENT

- 2.1 The Group Members agree that as at the date of Issue 1 of this Agreement the Memorandum of Agreement shall immediately terminate and be replaced by the terms and conditions contained in this Agreement.
- 2.1 From the date of Issue 1 of this Agreement any monies held pursuant to the Memorandum of Agreement shall be subject to this Agreement and in particular the terms of clause 5.2.

3. SCOPE OF THE COLLABORATION

- 3.1 The Group Members agree with one another to enter into this Agreement to generate and share high quality environmental information to assist the Group Members to contribute to the maintenance and enhancement of the rich and diverse marine environment of the Waterway and to perform the objects set out in clause 3.2 under the terms of this Agreement.
- 3.2 The Objects of the Group are to maintain surveillance of the quality of the marine physico-chemical environment, marine biology and ornithology of the foreshore, seabed and waters of the Milford Haven Waterway, by:
 - a) keeping under review all relevant surveys, surveillance and monitoring;
 - b) undertaking surveys to improve current knowledge and establish baselines;
 - c) undertaking surveillance projects;

- d) maintaining a compilation of literature and information.

3.3 The Group will:

- a) maintain under review a work programme of agreed projects;
- b) share technical output equally under joint ownership and copyright;
- c) function as a technical, science based, group;
- d) make its findings available to the wider community in addition to the Group Members.

3.4 Membership of the Group comprises statutory authorities, industry and others with an interest in the environmental quality of the Waterway. Membership will be at the invitation and discretion of the Group's existing members.

3.5 Any Group Member may, at their discretion, share with the other Group Members any information and /or data generated by their own environmental survey, monitoring or surveillance activities. In these instances, any such member shall retain its IP rights to that information or data. However, for the avoidance of doubt, this clause does not constrain the Group's use of information provided by any member to regulatory authorities, for example to meet statutory consenting processes, which has thereby entered the public domain.

3.6 For the avoidance of doubt:

- a) any survey, surveillance and monitoring agreed by the Group will be limited to crown foreshore, seabed and/or waters of the Waterway and will specifically exclude the premises, whether freehold or held under the terms of a commercial operating lease or license of any Group Member;
- b) nothing in this Agreement shall be deemed to override or in any way restrict the statutory obligations of any of the Group Members;
- c) the identification and consideration of political and management issues or the setting of environmental standards are specifically excluded from this Agreement. However, Group members are free, and are expected to use the Group's outputs, to help meet their own requirements.

4. CONTROL AND MANAGEMENT

4.1 A Committee comprising of one or more representatives nominated by each of the Group Members will be maintained for the purposes of:

- (a) discussing, determining and approving the purpose, terms of reference and work programme of the Group;
- (b) exchanging information;
- (c) implementing the agreed work programme;
- (d) reporting on progress, including publishing an annual report that comprises of a summary of all work undertaken for the year and work planned for the forthcoming year.

- 4.2 Each Group Member shall notify the Chairperson, or Secretary, in writing of their nominated representative and shall be entitled to appoint alternative representatives.
- 4.3 The Committee shall appoint a chairperson from its number to chair Committee meetings and a vice chairperson to chair committee meetings in the absence of the chair. In the absence of both the chair and the vice chair those nominated representatives present shall appoint one of their members present to act as chair for that particular meeting. The appointment of the chair and the vice Chair will be subject to biennial review, at which time the incumbent vice chair will normally be expected to assume the role of chair and a new vice-chair appointed, subject at all times to principles of good governance and best practice. Notwithstanding the above and subject to the agreement of Committee representatives, the term of the serving chair may be extended or any other representative appointed chair, depending on the circumstances then prevailing.
- 4.4 The quorum for meetings of the Committee shall be 5 nominated representatives of the Group Members. Notes of all meetings of the Committee shall be taken and copies of such notes circulated to Group Members as soon as practicable after each meeting.
- 4.5 Every effort will be made to ensure Committee business is conducted by consensus. In the event of issues arising at a meeting of the Committee that cannot be resolved by consensus, they shall be decided by a majority of votes and each nominated representative shall have one vote. In the case of an equality of votes the chairperson of the meeting shall have a casting vote.
- 4.6 The Committee may delegate any of its functions to sub-committees or to other persons as it considers appropriate for the task; provided that the delegation and the reasons therefore are recorded in writing.
- 4.7 The Committee will meet as often as necessary or desirable for the purposes of achieving the Objects at a convenient time and venue.
- 4.8 The Group Members shall at all times co-operate with each other and act in good faith to enable the Objects to be attained.

5. RESOURCING

- 5.1 Each of the Group Members will provide either a monetary contribution and/or some other contribution, *e.g.* services, premises, that shall be agreed by all the Group Members for the furtherance of the Objects of the Group in accordance with the work programme referred to in clause 3.3(a). The contributions are to be provided promptly within the time frames agreed for contributions.
- 5.2 Milford Haven Port Authority shall receive all financial contributions by Group Members and shall keep such monies in a separate interest bearing operational bank account in trust for the Group. The MHPA may also keep a proportion of MHWESG monies in a deposit savings account on behalf of the MHWESG on request by Group Members.

- 5.3 Other contributions for the furtherance of the Objects of the Group, as identified in clause 5.1, may include (where applicable) the sharing of environmental surveillance or monitoring data, information or reports collected by members for their own purposes or to meet legal obligations, as identified in clause 3.5.

6. CONTRACTS

Under the terms of this Agreement, the members agree that:

- 6.1 Milford Haven Port Authority shall have the authority to, and be the sole Group member to let contracts with third parties on behalf of the Group in order to achieve the Group's Objects, including the appointment of professionals, advisers and consultants on behalf of the Group, subject to request from and prior approval of the Committee, and clause 6.3. MHPA shall only let contracts with third parties on behalf of the Group upon written instruction from the Group compliant with the terms of clause 7.1. Responsibilities and liabilities arising from contracts will be owned by the Group; MHPA is the contract letting agent for administrative purposes.
- 6.2 Milford Haven Port Authority shall make payments on behalf of the Group in respect of contracts agreed at clause 6.1 but may not make any other payments or commitments on behalf of the Group without the prior approval of the Committee. Milford Haven Port Authority shall provide regular statements to the Committee in respect of such account.
- 6.3 No such contract shall be entered into unless there are sufficient funds available within the interest bearing bank account referred to in clause 5.2 to meet the obligations of Milford Haven Port Authority acting on behalf of the Group under the relevant contract.
- 6.4 Consultants and/or contractors will be engaged pursuant to MHPA's contract Terms and Conditions.

7. LIABILITY

- 7.1 Risk of liability will be minimised by:
- (a) agreeing to works and requesting contracts be let only when sufficient funds are available as set out in clause 6.3;
 - (b) ensuring prospective contractors have appropriate levels of expertise, experience, competence and responsibility,
 - (c) requiring contractors to carry appropriate liability insurance for damages arising as a result of fieldwork (prior to letting contracts (as stipulated in clause 6.1) and excluding liability arising from *force majeure* (as defined in clause 7.4));
 - (d) requiring Contractors to submit an appropriate Risk Assessment and Method Statement prior to the commencement of field based works;
 - (e) review and approval of Contractor's Risk Assessment and Method Statements by appropriate Group members, and / or delegated individual(s), most suited to the task, and maintaining written records of such reviews and approvals;

- (f) ensuring appropriate oversight of fieldwork and Contractors adherence to Risk Assessment and Method Statements by appropriate Group members, and / or delegated individual(s), most suited to the task, and maintaining written records of such oversight;
 - (g) including a professional indemnity liability exclusion statement in all Group reports.
- 7.2 The costs or consequences of any legal action against the Group or against MHPA in connection with the activities of MHWESG will be shared equally and the MHPA's risk as the party letting contracts will be mitigated through the measures set out in clause 7.1.
- 7.3 Consequently, as at the date of this Agreement the Group Members shall ensure that the Group has effected public liability insurance with a minimum limit of liability of £5,000,000 (five million pounds) in respect of each and every occurrence to cover the potential liability of the Group Members in relation to this Agreement and shall maintain such insurance until the date of termination of this Agreement.
- 7.4 The Group shall not be liable for losses, damages, costs and/or expenses incurred as a result of *force majeure* which shall include without limitation any failure or delay attributable to facts beyond the control of the Group such as wars, hostilities, boycotts, embargoes, public disorders, sabotage, strikes, lockouts, floods, fires, pandemic or acts of God.

8. INTELLECTUAL PROPERTY RIGHTS

- 8.1 All IP Rights developed or generated by the Group in pursuance of the Objects shall be owned by the Group Members jointly.
- 8.2 Any Group Member that withdraws from the Agreement will retain joint ownership of Group IP Rights developed or generated during the period of their membership of the Group.
- 8.3 Any Group Member shall be entitled to use any IP Rights free of charge provided that any such use shall not compromise the Objects of the Group and provided further that if any Group Member wishes to license or authorise any third party to use or exploit any IP Rights owned by the Group, the Group Members shall jointly agree and grant such a licence to such third party and such third party may be required to pay a licence fee. In all instances where use or exploit of any IP rights owned by the Group are supplied to a third party, irrespective of whether purpose is on behalf of any individual Group Member interests, signing of a Data Licence Agreement is required by the third party.
- 8.4 All costs and expenses and all receipts in respect of any IP Rights owned jointly by the Group Members shall be shared equally by the Group Members.
- 8.5 Each Group Member shall retain all rights to Intellectual Property in all materials, information etc. contributed by that Group Member as stipulated in clause 3.5.

9. TERM AND TERMINATION

- 9.1 The provisions of this Agreement shall come into force on the date of first issue stated above.
- 9.2 A Group Member may at any time terminate its participation in respect of this Agreement subject to having given notice in writing to the Chairperson with no right of return of financial contributions.
- 9.3 In the event that any Group Member is in breach of this Agreement which they fail to remedy within 14 days of written request by the Committee then such Group Member's involvement in the Group may be terminated by notice given to them by the Committee at any time following expiry of the said period of 14 days, with no right of return of financial contributions.
- 9.4 Subject to clauses 8.2 and 8.3 this Agreement will terminate on completion of the Objects stated in clause 3.
- 9.5 Upon termination of this Agreement the Group shall either be:
- (a) reconstituted as appropriate to fulfil the Objects of the Group; or
 - (b) terminated forthwith and the Group Members shall take such further steps as may be necessary in order to wind up the Group in a fair and reasonable manner.

The financial assets of the Group at winding up should be distributed or shared *pro rata* to the direct financial contributions by Group Members.

- 9.6 If a Group Member's participation in the Group is terminated in accordance with clause 8.2 or 8.3 the provisions of clauses 6.1 to 6.3 shall no longer apply in respect of that Group Member.

10. THIRD PARTIES

- 10.1 Nothing in this Agreement shall create any rights for third parties under the Contracts (Rights of Third Parties) Act 1999. No variation to this Agreement and no supplemental or ancillary agreement to this Agreement shall create any such rights unless expressly so stated in any such agreement by the Group Members to this Agreement. This does not affect any right or remedy of a third party that exists or is available apart from that Act.

11. NO BINDING PARTNERSHIP

- 11.1 Nothing in this Agreement shall be construed as establishing or implying any legally binding partnership between the Group Members.

12. SUCCESSORS

- 12.1 References in this Agreement to the Group Members shall include their respective heirs, successors in title, permitted assigns and personal representatives.

13. ASSIGNMENT

- 13.1 No Group Member should assign its interests in this Agreement without prior approval of the Committee (not to be unreasonably withheld) except that no such approval is required for an assignment to a company in the same group as the Group Member.

14. GENERAL

- 14.1 Provisions which by their terms or intent are to survive termination of this Agreement will do so.
- 14.2 No amendment or variation of this Agreement will be valid unless agreed in writing by an authorised signatory of each party with the exception of the circumstances set out in Clause 14.3.
- 14.3 This Agreement can be updated to enter details of new Group Members and update details of existing Group Member without the need for unaffected Group Members to re-authorise their signatures. The dates when these changes become effective are to be recorded alongside these updates. The Issue number of the Agreement remains unaffected by these updates.
- 14.4 Unless otherwise expressly agreed, no delay, act or omission by either party in exercising any right or remedy will be deemed a waiver of that, or any other, right or remedy.
- 14.5 Each party will do all further acts and execute all further documents necessary to give effect to this Agreement.

15 INFORMATION SHARING AND DATA PROTECTION

- 15.3 Several members of the Group (public bodies) are subject to the Freedom of Information (FoI) Act and Environmental Information Regulations (EIR) whilst others (industry bodies) are not. Whilst circumstances under which valid FoI and/or EIR requests may be submitted to the Group are anticipated to be limited since the Group operates transparently, places all outputs in public domain, and commercial tender assessments and contract details are protected by confidentiality exemptions, every effort will be made to meet any such request, taking into account advice and guidance from the Information Commissioner's Office and the obligations on public bodies.
- 15.4 The Group will comply with the Data Protection Act and UK-GDPR, and adhere to the data protection principles to ensure personal data is safeguarded.

16. REVIEW

- 16.1 This Agreement will be subject to full review and reaffirmation at five yearly intervals from the date of the Agreement.

16.2 This Agreement shall be subject to review at shorter intervals as necessitated under circumstances set out in Clause 14.3.

17. COUNTERPARTS

This Agreement may be executed in any number of counterparts, each of which is an original and which together have the same effect as if each Group Member had signed the same document.

IN WITNESS whereof the Parties have signed this Agreement on the day and year written.

Signed by: Name:
For and on behalf of **DRAGON LNG LIMITED** Date:

Signed by: Name:
For and on behalf of **MILFORD HAVEN PORT AUTHORITY** Date:

Signed by: Name:
For and on behalf of **NATURAL RESOURCES WALES** Date:

Signed by: Name: For
and on behalf of **PEMBROKESHIRE COAST NATIONAL PARK AUTHORITY**
Date:

Signed by: Name:
For and on behalf of **PEMBROKESHIRE COUNTY COUNCIL** Date:

Signed by: Name:
For and on behalf of **PUMA ENERGY (UK) LTD** Date:

Signed by: Name:

For and on behalf of **RWE GENERATION UK PLC** Date:

Signed by: Name:

For and on behalf of **VALERO PEMBROKESHIRE OIL TERMINAL LTD** Date:

Signed by: Name:

For and on behalf of **SOUTH HOOK LNG TERMINAL COMPANY LTD** Date:

Signed by: Name:

For and on behalf of **VALERO ENERGY LTD** Date:

Signed by: Name:

For and on behalf of **PEMBROKESHIRE COASTAL FORUM** Date:

Signed by: Name:

For and on behalf of **NEYLAND YACHT HAVEN LTD** Date:

Appendix 3: Chronological list of MHWEMSG / MHWESG² reports**1992**

Hobbs, G and Morgan, C I (eds.) (1992). *A review of the current state of environmental knowledge of the Milford Haven Waterway*. Report from Oil Pollution Research Unit; xi & 140pp

Hobbs, G and Morgan, C I (eds.) (1992). *A review of the current state of environmental knowledge of the Milford Haven Waterway; Executive Summary*. Report from Oil Pollution Research Unit, 12pp

MHWEMSG (1992). *Report of the Milford Haven Waterway Environmental Monitoring Steering Group 1992*. 6pp

1993

Hodges, J E (1993). *Daugleddau Estuary and Milford Haven Waterway annual shelduck survey: report for 1993*. Report from Pembrokeshire Coast National Park Authority, 8pp + appendices

1994

Ellis, R & Poole, A (1994). *Cleddau Estuary wader and wildfowl counts 1993 – 94*. 20 pp + appendices

Hodges, J E (1995). *Daugleddau Estuary and Milford Haven Waterway annual shelduck survey: report for 1995*. Report from Pembrokeshire Coast National Park Authority, 8pp + appendices

Levell, D, Smith, J and Hobbs, G (1994). *Milford Haven macrobenthic survey October 1993*. Report from Oil Pollution Research Unit; xii, 26pp + figures, tables & data appendices.

MHWEMSG (1994). *Report of the Milford Haven Waterway Environmental Monitoring Steering Group 1993/94*. 20pp

Smith, J and Hobbs, G (1994). *Metal concentrations in Milford Haven sea bed sediments - data storage, analysis and initial interpretation*. Report from Oil Pollution Research Unit; v, 8pp + tables & maps

1995

Hodges, J E (1995). *Daugleddau Estuary and Milford Haven Waterway annual shelduck survey: report for 1995*. Report from Pembrokeshire Coast National Park Authority 10pp + appendices

Howe, M (1995). *Monitoring of eelgrass populations in the Milford Haven waterway and Daugleddau Estuary*. Report from Pembrokeshire Coast National Park Authority; 7pp

MHWEMSG (1995). *Report of the Milford Haven Waterway Environmental Monitoring Steering Group 1994/95*. 19pp

Poole, A & Ellis, R (1995). *Cleddau Estuary including Milford Haven Waterway: wildfowl and wader counts 1994 – 95*. 30pp

Rostron, D M (1995). *The macrobenthos of the foreshore soft sediments of Milford Haven, 1994*. Report from SubSea Survey; 2 vols, 17pp + maps, figures & data appendices

² The Group changed its name in 2000

1996

Hodges, J E (1996). *Daugleddau Estuary and Milford Haven Waterway annual shelduck survey: report for 1996*. Report from Pembrokeshire Coast National Park Authority, 8pp + appendices

MHWEMSG (1996). *Report of the Milford Haven Waterway Environmental Monitoring Steering Group 1995/96*. 14pp

Poole, A (1996). *Milford Haven and Cleddau Estuary wetland bird survey 1995-96*. 18pp

1997

Hodges, J E (1997). *Daugleddau Estuary and Milford Haven Waterway annual shelduck survey: report for 1997*. Report from Pembrokeshire Coast National Park Authority. 10pp + tables & appendices

MHWEMSG (1997). *Report of the Milford Haven Waterway Environmental Monitoring Steering Group 1996/97*. 36pp

Moore, J J (1997). *Rocky shore transect monitoring in Milford Haven, October 1995*. Report from Oil Pollution Research Unit. OPRU Report No OPRU/14/96. 36pp + appendices

Poole, A (1997). *Milford Haven Waterway and Cleddau Estuary bird survey 1996-97*. 13pp + appendices

1998

Hodges, J E (1998). *Daugleddau Estuary and Milford Haven Waterway annual shelduck survey – report for 1998*. Report from Pembrokeshire Coast National Park Authority. 9pp + tables & appendices

Munro, C (1999). *Monitoring of the rocky sub-littoral of Milford Haven: May-July 1998*. Report from Marine Biological Surveys. v, 38pp + appendices, photographs and videorecording

Poole, A (1998). *Milford Haven Waterway and Cleddau Estuary bird survey 1997-98*. 12pp + appendices

1999

Hodges, J E (1999). *Daugleddau Estuary and Milford Haven Waterway annual shelduck survey – report for 1999*. Report from Pembrokeshire Coast National Park Authority. 8pp + tables & appendices

Kitts, H (1999). *Quantification of inputs to Milford Haven*. Report from Hyder Ltd. 29pp + tables & appendices

MHWEMSG (1999). *Report of the Milford Haven Waterway Environmental Monitoring Steering Group 1997 - 1999*. 25pp

Poole, A (1999). *Milford Haven Waterway and Cleddau Estuary Bird Survey 1998-99*. 13pp + appendices

Posford Duvivier (2000). *A survey of subtidal Zostera beds in Milford Haven*. 36pp + appendices

2000

Bent, E J (2000). *A review of environmental studies in Milford Haven Waterway 1992 – 2000*. iv, 65 pp + tables & maps

Hodges, J E (2000). *Daugleddau Estuary and Milford Haven Waterway annual shelduck Survey – Report for 2000*. Report from Pembrokeshire Coast National Park Authority. 10pp + tables + appendices

MHWESG (2000). *Milford Haven Waterway Environmental Surveillance Group Annual Report 1999 - 2000*. 20pp & appendices

Poole, A (2000). *Milford Haven waterway and Cleddau Estuary Bird Survey 1999-2000*. 15pp + appendices

2001

Hodges, J E (2001). *Daugleddau Estuary and Milford Haven Waterway surveillance of summer shelduck populations: report for 2001*. Report from Pembrokeshire Coast National Park Authority. 8pp + appendices

Poole, A (2001). *Milford Haven Waterway and Cleddau Estuary bird survey 2000-01*. 14pp + appendices

2002

Hodges, J E (2002). *Daugleddau Estuary and Milford Haven Waterway surveillance of summer shelduck populations: report for 2002*. Report from Pembrokeshire Coast National Park Authority. 8pp + appendices

Poole, A (2002). *Milford Haven Waterway and Cleddau Estuary bird survey 2001-02*. 12pp + appendices

2003

Bent, E J (2003). *Milford Haven Waterway review of work programme 2000 – 2010*. 32pp

Hodges, J E (2004). *Daugleddau Estuary and Milford Haven waterway surveillance of summer shelduck populations: report for 2003*. Report from Pembrokeshire Coast National Park Authority. 9pp + appendices

Poole, A (2003). *Milford Haven Waterway and Cleddau Estuary bird survey 2002-03*. 16pp + appendices

Prosser, M V & Wallace H L (2003). *Milford Haven salt-marsh survey 2002*. Report from Ecological Surveys (Bangor). 2 vols. 58pp + appendices, photographs & maps

2004

Hodges, J E (2004). *Daugleddau Estuary and Milford Haven Waterway surveillance of summer shelduck populations: report for 2004*. Report from Pembrokeshire Coast National Park Authority. 7pp + appendices

Haycock, A (2004). *Milford Haven Waterway and Cleddau Estuary Bird Survey 2003-04*. 14pp + appendices

2005

Atkins (2005). *Development of an Inputs Budget for Milford Haven Waterway*. 68pp + cd database & GIS data

Hodges, J E (2005). *Daugleddau Estuary and Milford Haven Waterway surveillance of summer shelduck populations: report for 2005*. Report from Pembrokeshire Coast National Park Authority. 8pp + appendices

Haycock, A (2005). *Milford Haven Waterway and Cleddau Estuary Bird Survey 2004-05*. 7pp + appendices

2006

Hodges, J E (2006). *Daugleddau Estuary and Milford Haven Waterway surveillance of summer shelduck populations: report for 2005*. Report from Pembrokeshire Coast National Park Authority. 8pp + appendices

Haycock, A (2006). *Milford Haven Waterway and Cleddau Estuary Bird Survey 2004-05*. 7pp + appendices

Warwick, R (2006). *Review of benthic and intertidal sediment macrofauna data and development of a surveillance programme*. 105pp + electronic data annex

2007

Hodges, J E (2007). *Daugleddau Estuary and Milford Haven Waterway surveillance of summer shelduck populations: report for 2006*. Report from Pembrokeshire Coast National Park Authority. 8pp + appendices

2008

Haycock, A (2008). *Wildfowl and wader counts on the Milford Haven Waterway 2006-07* 20pp

Haycock, A (2008). *A review of the status of wetland birds in the Milford Haven waterway and Daugleddau estuary*. A report to the Milford Haven Waterway Environmental Surveillance Group. 122pp

Hodges, J E (2008). *Daugleddau Estuary and Milford Haven Waterway surveillance of summer shelduck populations: report for 2008*. Report from Pembrokeshire Coast National Park Authority. 26pp + appendices

2009

Haycock, A (2009). *Wildfowl and wader counts on the Milford Haven Waterway 2007-08* 20pp

Hodges, J E (2009). *Daugleddau Estuary and Milford Haven Waterway surveillance of summer shelduck populations: report for 2009*. Report from Pembrokeshire Coast National Park Authority. 9pp + appendices

Langston, W J, O'Hara, S, Imamura M & Pope, N D (2009) *Bioaccumulation surveillance in Milford Haven Waterway 2007-2008*. Report to the Milford Haven Waterway Environmental Surveillance Group from the Marine Biological Association Plymouth. 66pp + appendices

Little, D I (2009) *Sediment Contaminants & Transport Review*. A report to the Milford Haven Waterway Environmental Surveillance Group. 368pp + appendices

2010

Haycock A (2010). *Wildfowl and wader counts on the Milford Haven Waterway, 2009-10*. A report to the Milford Haven Waterway Environmental Surveillance Group. 24pp

Hodges, J E (2010). *Daugleddau Estuary and Milford Haven Waterway surveillance of summer shelduck populations: report for 2010*. Report from Pembrokeshire Coast National Park Authority. 8 pp + appendices

Mieszowska, N. (2011). *Reestablishment of intertidal rocky surveillance*. A report to the MHWESG from the Marine Biological Association on ot the UK. 54pp + appendices.

2011

Haycock A (2011). *Wildfowl and wader counts on the Milford Haven Waterway, 2010-11*. A report to the Milford Haven Waterway Environmental Surveillance Group. 24pp

Hodges, J E (2011). *Daugleddau Estuary and Milford Haven Waterway surveillance of summer shelduck populations: report for 2011*. Report from Pembrokeshire Coast National Park Authority. 8pp + appendices

2012

Fugro-ERT (2012). *Investigation into the source of hydrocarbons present in sediment samples from Milford Haven waterway*. Report to the Milford Haven Waterway Environmental Surveillance Group from the Fugro-ERT (Fugro Geoconsulting). v&40pp + appendices

Hodges, J E (2012). *Daugleddau Estuary and Milford Haven Waterway surveillance of summer shelduck populations: report for 2012*. Report from Pembrokeshire Coast National Park Authority. 9pp + appendices

Langston, W J, O'Hara, S, Davey, M, Shortridge, E, Pope, N D, Harino, & Vane, C H. (2012) *Bioaccumulation surveillance in Milford Haven Waterway Phase II (2010)* Report to the MHWESG from the Marine Biological Association UK. 85pp + appendices

2013

Germano & Associates (2013). *Sediment-Profile Imaging Survey of Milford Haven Waterway, Wales, UK - May 2012*. Report to the Milford Haven Waterway Environmental Surveillance Group from Germano & Associates, Inc., Seattle, Washington, USA. vii&34pp + tables, figures and appendices

Haycock, A (2013). *A review of the status of wetland birds in the Milford Haven Waterway and Daugleddau Estuary 2013* A report to the Milford Haven Waterway Environmental Surveillance Group. 123pp

Hodges, J E (2013). *Daugleddau Estuary and Milford Haven Waterway surveillance of summer shelduck populations: report for 2013*. Report from Pembrokeshire Coast National Park Authority. 9pp + appendices

2014

Galperin, Y & Little, D I (2014). *Forensic Evaluation Of Milford Haven Sediment Hydrocarbon Contamination: Supplemental Report*. Report to Milford Haven Waterway Environmental Surveillance Group from EGC Consulting California USA & David I. Little; 60 pp.

Haycock, A (2014). *A review of the status of wetland birds in the Milford Haven Waterway and Daugleddau Estuary 2013-14*. A report to the Milford Haven Waterway Environmental Surveillance Group; 24 pp.

Hodges, J E (2014). *Daugleddau Estuary and Milford Haven Waterway surveillance of summer shelduck populations: report for 2014*. Report from Pembrokeshire Coast National Park Authority. 11pp + appendices

Morrell, S (2014). *Rocky Shore Surveillance 2013*. Report to Milford Haven Waterway Environmental Surveillance Group from the Field Studies Council Dale Fort Field Centre; 50 pp.

Little, D I & Galperin, Y, 2014. *Milford Haven sediment hydrocarbon and metals contamination: supplemental report on recent contaminant trends*. Report to Milford Haven Waterway Environmental Surveillance Group

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