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Industry & Buildings**

To: Permit Receipt Centre, Natural Resource Wales
From: Claire Gilchrist
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Subject: River Dee Load-out Facility Marine Licence Application: Water Framework Directive Compliance Assessment

1 Introduction

1.1 Purpose of this document

In accordance with Natural Resource Wales' (NRW's) guidance for marine licence applications for dredging and/or disposal of dredge material operations, an assessment under the Water Framework Directive (WFD) is required to support a marine licence application (MLA).

This WFD compliance assessment has been carried out in support of an application for a renewal of the marine licence for the maintenance dredging and disposal of dredged arisings at the Airbus Load-out Facility (LoF), located on the River Dee, North Wales. The dredging of the LoF is essential for the continual transportation of A380 wings by the Dee River Craft from Broughton to the Port of Mostyn. In 2018, 14 wings were transported from the LoF. The current marine licence (DML1617) expires on 07 August 2019. The previous licence (13/06/ML/2) expired on 21 May 2016. This is the fifth application to be submitted by Airbus, for this on-going operation. A WFD compliance assessment has been undertaken for each licence renewal.

The assessment has been undertaken in accordance with the Environment Agency's (EA) 'Clearing the Waters for All' guidance (Environment Agency, 2016). To support the assessment, updated sediment sample analysis has been undertaken, the results of which is provided in **Section 2.1**.

1.2 Scheme outline

In order to maintain an even keel and height, the Dee River Craft rests upon a frame when wings are being loaded. The nature of the river is such that sediment accumulates in the berth, effectively covering the frame, thus providing an uneven surface that is unsuitable for the DRC to rest upon. Consequently, a bespoke dredger has been used since 2007 to remove sediment from the frame on a daily basis. Very infrequently dredging and disposal is undertaken twice daily (12 hours apart); this was undertaken on five occasions throughout 2018.

Maintenance dredging takes place on the frame to a target depth of 200mm below the surface of the frame (0.5m AOD) and is continuous. The frame has been divided into eight sections, with one section being dredged per day. Sections of the frame are dredged when necessary rather than on a rotational basis.

The dredged material is deposited immediately back into the river via a side-cast arm approximately 12.5m long. The discharge outlet is upturned and constricted, which sprays the discharge a further 15m to 20m across the river channel. This methodology is referred to as rainbowing and has a number of environmental advantages over simply discharging the material via a pipe, as:

- 1 It ensures full aeration of the discharge, thereby reducing any oxygen demand;

- 2 It disperses the dredged material over a wide section of the river preventing dense plumes of suspended sediments;
- 3 It prevents the dredged material from forming berms that could impede navigation; and,
- 4 It reduces the tendency for foam to occur as small water droplets contain less air and bubbles tend to dry out.

Continual dredging also prevents the need to dredge large quantities of material at once thus reducing the activity's effect on water quality.

2 WFD Compliance Assessment

The Environment Agency's guidelines for WFD assessment, "Clearing the Waters for All" (Environment Agency, 2016), describes a three-stage approach, with the scope of each stage determined by the output from the preceding stage. The initial screening stage identifies activities that are considered to be low risk and excludes them from the subsequent two stages, scoping and impact assessment.

2.1 Stage 1 – Screening

The screening stage allows regulators and operators to determine whether an individual pre-existing maintenance dredge needs further assessment to establish if it complies with the WFD. This stage only applies to pre-existing (maintenance) dredging and associated disposal activities, for instance, those which started, or were ongoing, during the period 2006–2008, such as the dredging and disposal activities associated with the LoF. If the activity was carried out during this period, the Environment Agency considers that it has taken account of any significant effects or impacts on status.

Dredging and disposal activities at the LoF are located within the 'Dee (North Wales)' transitional water body (GB531106708200). Further information on the Dee waterbody is provided within **Table 2-1**.

Table 2-1 Screening information for Dee (North Wales) waterbody (information from, Gov.UK, 2019)

Water body	Description, notes or more information
WFD water body name	DEE, N. WALES
Water body ID	GB531106708200
River basin district name	Dee
Water body type	Transitional
Water body total area	109.29 km ²
Overall water body status (2018)	Moderate
Ecological status	Moderate
Chemical status	Fail
Target water body status and deadline	Good by 2021
Hydromorphology status of water body	Supports Good
Heavily modified water body and for what use	Yes (Navigation Ports and Harbours)
Higher sensitivity habitats present	Mussel beds, including blue and horse mussel (37.77 ha); Polychaete reef (1.29 ha); Saltmarsh (2647.83 ha).
Lower sensitivity habitats present	Cobbles, gravel and shingle (4.29 ha);

Water body	Description, notes or more information
	Intertidal soft sediment (8239.72 ha); Rocky shore (44.17 ha); Subtidal rocky reef (0.86 ha); Subtidal soft sediments (679.37 ha).
Phytoplankton status	Moderate
History of harmful algae	Yes
WFD protected areas within 2km	River Dee/Afon Dyfrdwy Site of Special Scientific Interest (SSSI); River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid Special Area of Conservation (SAC).

The activities associated with the scheme are presented in **Section 1.2** and summarised in **Table 2-2** below.

Table 2-2 Activity Information

Your activity	Description, notes or more information
Applicant name	Airbus Operations Ltd
Application reference number (where applicable)	TBC
Name of activity	Maintenance Dredging and subsequent disposal for the transportation of A380 wings.
Brief description of activity	Airbus Operation Ltd.'s LoF is located on the River Dee, Broughton, in North Wales. The LoF enables the transportation of Airbus A380 wings from Broughton to the Port of Mostyn, on the Welsh coast of the River Dee. In order to maintain an even keel and height, the Dee River Craft rests upon a frame when wings are being loaded. In 2018, 14 wings were transported from the LoF. The nature of the river is such that sediment accumulates in the berth, effectively covering the frame, thus providing an uneven surface that is unsuitable for the DRC to rest upon. Consequently, a bespoke dredger has been used since 2007 to remove sediment from the frame on a daily basis. Very infrequently dredging and disposal is undertaken twice daily (12 hours apart), this was undertaken on five occasions throughout 2018. The bespoke dredging vessel deposits the dredged material by 'rainbowing' the sediments into the River Dee.
Location of activity	Load out Facility, River Dee, Broughton, North Wales (53° 11.60' N, 2° 58.10' W)
Footprint of activity	747m ²
Timings of activity (including start and finish dates)	Ongoing maintenance (on average 4.69 hours per day in 2018).
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	Up to 18,000 metric tonnes per year
Use or release of chemicals (state which ones)	None

The Dee River Basin Management Plan (RBMP) reports deterioration in the chemical status of the River Dee since production of the WFD compliance assessment undertaken in support of the previous marine licence renewal (Ref: 13/06/ML/2) (Natural Resources Wales, 2016a). However, dredging and disposal activities are not reported as elements within the Dee RBMP responsible for this deterioration in status (Natural Resources Wales, 2016b).

2.2 Supporting Information

To support the WFD compliance assessment, water quality monitoring of the dredging operation has previously been undertaken to determine the effect this operation is having on river water quality. A report produced in October 2013 (Royal HaskoningDHV, 2013; attached to the MLA), concluded that the dredging operations were having a localised but minor effect on total suspended solid (TSS) levels in the River Dee, with levels remaining well within the natural variations exhibited within the river. The highest TSS level recorded was 124.6 mg/l, recorded at 500m from the dredging near to the north bank of the river, whilst the lowest recorded level was 81.9 mg/l at 200m from the dredging in the centre of the channel. The data shows that the dredging is not affecting water quality at 200m downflow, given that all TSS levels were below those recorded upflow.

In addition, surface sediment sampling of the area to be dredged (**Figure 1**; attached to the MLA) was undertaken in April 2019. A sampling plan for sediment collection and laboratory analysis was received from Cefas (via NRW) in April 2019. The sampling plan provided was based on proposals to dredge up to 18,000 tonnes of material to a depth of 0.2m below seabed.

Three surface sample sites were collected from across the dredge area. Analysis for the following parameters were requested within the sample plan; Cadmium (Cd), Chromium (Cr), Copper (Cu), Mercury (Hg), Nickel (Ni), Lead (Pb), Zinc (Zn) and Arsenic (As). The results are shown in **Table 2-3**.

Table 2-3 Contamination Analysis Results (Unit: mg/kg ppm, total solids in %)

Laboratory sample number	Sample ID(s)	Total Solids	As	Cd	Cr	Cu	Hg	Ni	Pb	Zn
MAR00230.001	No 1 Airbus LOF River Dee bed surface sediment	69.4	5.1	0.22	10.6	9.8	0.06	8.6	15.3	90.2
MAR00230.002	No 2 Airbus LOF River Dee bed surface sediment	76	7.1	0.18	9.1	9	0.03	9.1	20.2	86
MAR00230.003	No 3 Airbus LOF River Dee bed surface sediment	68.3	4.9	0/19	7.9	8.1	0.04	6.7	11.1	82

Cefas Action Levels (AL) are used as part of a 'weight of evidence' approach to assessing the suitability of dredged material for disposal at sea, but are not themselves statutory standards (Cefas, 2000). Cefas guidance indicates that, in general, concentrations of contaminants within sediment which are below AL1 are not considered to be of concern and are, therefore, likely to be approved for disposal at sea. Cefas Action Levels are presented in **Appendix A** for information. There are no exceedances of any contaminants against Cefas AL1.

2.3 Conclusions

Given the information presented above, due to the nature of the work being proposed, the baseline environment and the status of the 'Dee, North Wales' waterbody, the scheme has been screened out of the Clearing the Waters for All Guidance (Environment Agency, 2016). Therefore, no further WFD impact assessment is required.

3 References

Cefas (2000) Use of Action Levels in Dredged Material Assessments.

Environment Agency (2016) Clearing the Waters for All: Water Framework Directive assessment: estuarine and coastal waters.

Gov UK (2019) Water Framework Directive assessment: estuarine and coastal waters. Available from: <https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters>. Accessed on 23/04/2019

Natural Resources Wales (2016a). Dee River Basin Management Plan 2015 – 2021 Summary. Natural Resources Wales. December 2015.

Natural Resources Wales (2016b). Water Watch Wales; WFD Data Download. Available from: <http://waterwatchwales.naturalresourceswales.gov.uk/en/>. Accessed on: 04/03/2016

Royal HaskoningDHV (2013) Load out Facility Water Quality Monitoring Dredging Operation Fourth Round. October 2013

Appendix A - Current Cefas Action Levels

Table A1 Current Cefas Action Levels

Contaminant	AL1 (mg/kg)	AL2 (mg/kg)
Arsenic	20	100
Cadmium	0.4	5
Chromium	40	400
Copper	40	400
Nickel	20	200
Mercury	0.3	3
Lead	50	500
Zinc	130	800