Centre for Environment Fisheries & Aquaculture Science

Cefas

MARINE AND COASTAL ACCESS ACT (2008). CONSULTATION TO DISCHARGE MID-LICENCE SAMPLING CONDITION FROM L/2015/00427 FOR THE MAINTENANCE DREDGING LICENCE AT TEES AND HARTLEPOOL, TEES ESTUARY.
Reference Number: L/2015/00427/2

From: Cefas, Lowestoft Laboratory
Date: 14th August 2019
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To: Luella Williamson - MMO (by MCMS)

1. With reference to the above application and your request for comments please find my advice below.

Description of the proposed works

2. PD Teesport hold a ten-year licence (L/2015/00427/2) to conduct maintenance dredging at Tees and Hartlepool. Condition 5.2.3 of this licence stipulates that mid-licence sample analysis must be conducted *"prior to dredging in the fourth and subsequently the seventh and tenth year of the licence."* This licence permits PD Teesport to dispose of 243,842 wet tonnes (187,570 m^3) of material from the Port of Tees, and 45,128 wet tonnes (34,740 m^3) of material from the Port of Hartlepool at Tees Bay A (TY160) per annum. PD Teesport are licensed to use trailer suction hopper dredging (TSHD) for these works.

3. Condition 5.2.3 also stipulates that the future sediment sampling is undertaken *"of at least three yearly intervals"*. Given that the licence came into force on 1 January 2016, mid-licence sediment analysis should have been conducted and signed off by the MMO by 1 January 2019. Whilst I recognise that the applicant has now supplied data in this consultation, it is worth remembering this at the next two rounds of mid-licence sampling, specifically, that sediment data should be provided to the MMO to be signed off before 1 January 2022 and 1 January 2025.

Sediment Analysis

4. The applicant states:

> "*Consultation was undertaken with the MMO to agree a programme of mid-licence sampling for this licence via SAM/2018/00050 and SAM/2018/00069.*
> *It was agreed with MMO that the data in 'Carcinus - 20126278 - MMO Results' would support both the marine licence application for the Hartlepool channel project and the mid-sampling licence condition on MLA/2015/00088 (as the dredge area for the Hartlepool channel project overlapped with part of the maintenance area on MLA/2015/00088).*
> *The same principle has been applied to the Northern Gateway Container Terminal project (as part of the dredge area for the Northern Gateway Container Project overlaps with the maintenance area on MLA/2015/00088 in the Tees estuary) - the results provided in 'MMO_Results_Template MAR00179 V3' are the samples that MMO requested from the Tees estuary to inform MLA/2015/00088."*

5. Pre-application sampling advice was provided under two separate consultations: SAM/2018/00050 (Hartlepool), and; SAM/2018/00069 (Tees, and Northern Gateway Container Terminal [NGCT]). SAM/2018/00050 recommended that **13 sample sites** would be required to support mid-licence analysis, whereas the results detail that only 10 samples were recovered from Hartlepool. Whilst fewer than originally recommended, I am content that these are sufficient to support this consultation (as it relates to dredging activities at Hartlepool).

6. SAM/2018/00069 recommended that **37 samples sites** would be required to support the NGCT application, and recommended an additional **10 samples** to be taken from the maintenance area, which extends further upstream than the NGCT area. The applicant has taken 10 samples from the upstream (maintenance) area; however, they have not provided any data for the area downstream (see Fig 1). Whilst 10 samples are consistent with the licensed dredge volume according to OSPAR guidelines, i.e. 7 – 15 samples for dredges between 100,000 m^3 and 500,000 m^3, their locations do not sufficiently represent the dredge area as a whole. It is expected that the samples collected to support the NGCT (as recommended under application SAM/2018/00069) would provide the necessary spatial coverage, so I recommend these be supplied to support this application

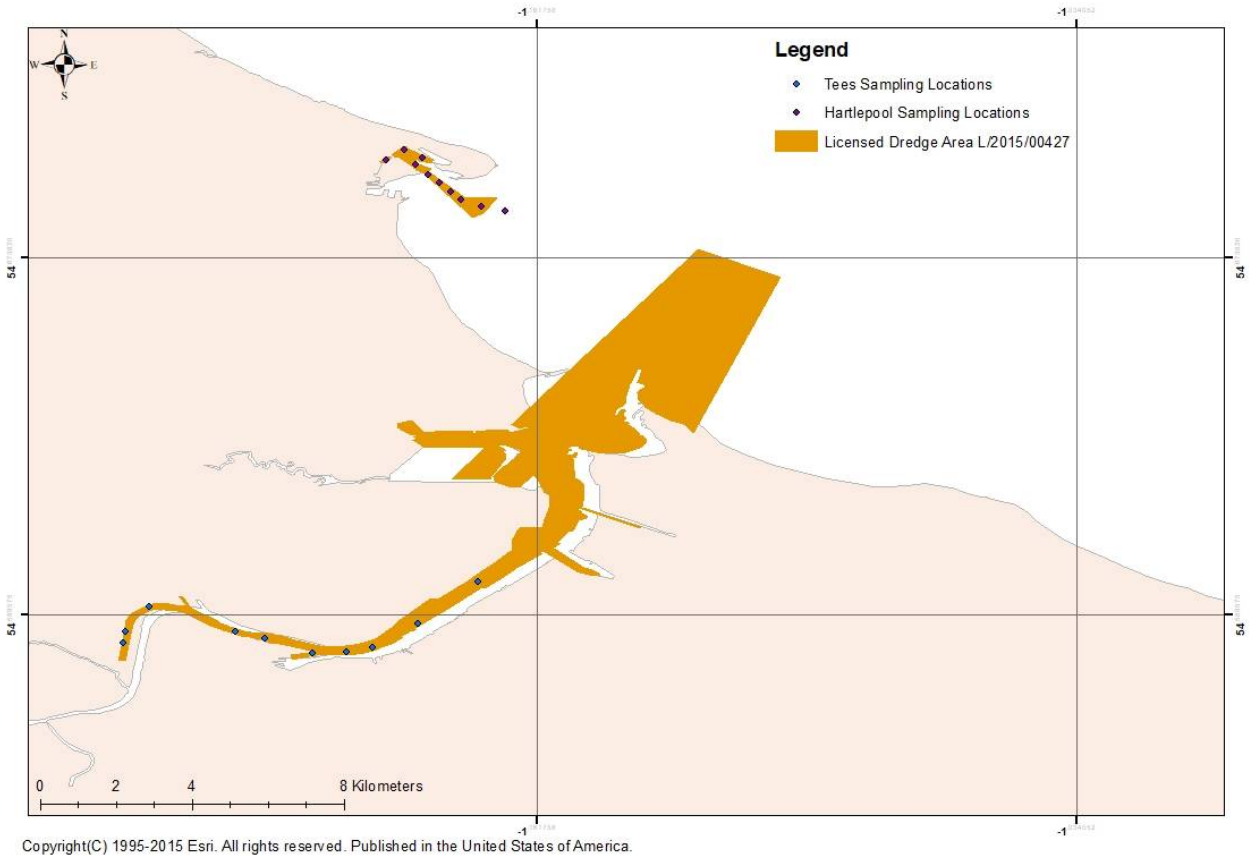

Figure 1. Map detailing the sampling locations in relation to the licensed dredge area.

7. In SAM/2018/00069, the applicant detailed that the general Tees Bay area comprised substantial amounts of inert glacial deposits, which due to their large particle size composition, are considered exempt from analysis under OSPAR. However, this was to inform decisions concerning subsurface sampling. Point 7 of Cefas advice for this consultation

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(Andrew Griffith, 13 November 2018) detailed that the applicant should still conduct surface sampling in areas where glacial mudstone was thought to be present.

8. PD Teesport (the applicant for NGCT and licence holder for this consultation) raised a query with Cefas over the requirement in SAM/2018/00069 to test for PBDEs. They provided indicative sampling data of all analytes to support their query, arguing that these indicative data adequately satisfied the dredge area for the Tees. These indicative data appear to be the recommended additional 10 upstream maintenance samples referred to in point 6 of this advice minute, though they lack application information. As such, it's my conclusion that the applicant has provided the indicative NGCT sampling data to discharge the condition to which this consultation pertains. I therefore presume that surface sampling is currently being conducted to fulfil the NGCT sampling advice. These sampling locations are likely to provide better spatial representation than the current data, and as such, I recommend that the applicant provides these data when they have been analysed, to support the full discharging of the condition.

Hartlepool Dredge Material Quality

9. Samples from the Hartlepool dredge area were tested (under SAM/2018/00050) for heavy metals and arsenic, organotins, polycyclic aromatic hydrocarbons (PAH) and particle size (PSA). Approximately 50% of samples were elevated above Cefas Action Level 1 for metals, notably, arsenic (As), nickel (Ni) and lead (Pb). When comparing AL1 and AL2, the levels are comfortably closer to AL1 than AL2. There were no elevations of di- and tributyltins. There were a range of results for PAHs: Whilst there were no elevations of acenapthylene or perylene, there were minor to moderate elevations of all other analytes. Sample 4242816, specifically, showed high elevations of C1, C2 and C3 napthalenes and phenanthrene.

10. For lack of an AL2 threshold for PAHs, Cefas utilise the Gorham-test Method to assess if observed levels are acceptable for disposal at sea. Under this method, the sum total of low- (LMW) and high molecular weight (HMW) PAHs are considered against observed effects-ranges. At effects-range low (ERL), few to no samples exhibit observed effects, at effects-range median (ERM), the median number of samples exhibit observed effects. Meeting the ERM can help to indicate whether the risk of material contaminating the marine environment is acceptable, or high.

11. It is important to note here that the North-east coastal area is generally associated with the presence of anthropogenic contaminants, due to industrial activity in and around the river. As such, we give consideration not only to whether contaminant levels are below a certain threshold, but also whether they indicate a declining trend and/or are within ranges expected for the area (or recently received by the proposed disposal sites). For ease of understanding, I've compiled a table comparing the pre-application PAH Gorham-test results with the 2019 dataset. This table compares the proportions of samples that met or exceeded the various thresholds, as a percentage of the dataset:

	LMW ERL	LMW ERM	HMW ERL	HMW ERM
2015	100%	100%	100%	24%
2019	100%	60%	50%	0%

12. Table 1 shows that three threshold values are generally lower than they were at the application stage, and one remaining constant, though it should be noted that this is not a

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direct comparison, and the analysis is indicative only. The results show that there is still an elevated presence of LMW PAHs, which tend to be more persistent and more toxic to marine life. I note though, that no additional requirements i.e. exclusion or additional testing, was mandated at the pre-aplication stage, thus it can be deduced that Tees Bay A has likely received material of this chemical composition. So, the material at Hartlepool can be considered acceptable for disposal at sea at this time. However, given the consistently high levels of LMW PAHs, I recommend that individual PAH congener analysis is conducted at the next round of mid-licence sampling.

Tees Dredge Material Quality

13. Whilst the applicant should provide additional sample data that fully represents the dredge area, I am content to consider the results provided to give an indication of the composition of the upstream section of the dredge area. In these results there were elevations above AL1 for nearly all metal analytes, except for As, where only four samples were marginally elevated, and Ni where nine samples were marginally elevated, and one wasn't. The results for cadmium, chromium and mercury indicate a general elevation between AL1 and AL2, however, lead and zinc indicate multiple elevations that are close to AL2. Whilst this does not automatically preclude material from being disposed at sea, it may require further monitoring to ascertain whether these levels are increasing. There was only one marginal elevation for organotins; the rest were below AL1.

14. The results for polychlorinated biphenyls (PCBs) indicate elevation above AL1 for nine samples at the ICES7 threshold, and eight samples at the Total 25 threshold. One sample was under AL1 for both thresholds. However, one sample, at Billingham Reach, recorded 1.91365 ppm, thus exceeding the AL2 threshold for Total 25 threshold (AL2 = 0.2ppm). This same sample recorded 1.07436 ppm for the ICES7 threshold (AL1=0.01ppm), for which there is no AL2. There were no PCB analysis data collected at the pre-application stage. As such, material from Billingham Reach is not suitable for at-sea disposal until such a time that the applicant brings additional evidence to show that levels of Total 25 PCB congeners are below AL2.

15. When using the Gorham-test approach, the results for PAHs indicate that there is a high presence of both LMW and HMW PAHs, notably higher when compared with the results for Hartlepool. The ERL is met for both LMW and HMW, whilst the ERM is met for all LMW and 50% of HMW. This does not show a general decrease in levels when compared to the 2015 dataset. Based on the results in and of themselves, I would not consider the material acceptable for at-sea disposal, however, my final recommendation is deferred until additional data are presented as per points 6 – 8 of this advice minute. Please refer to Annex 1 for bar graphs describing this analyte in greater detail.

Conclusion

16. Based on the data provided for this consultation, I **do not** deem the continuation of licensable activities acceptable. Additional data are required to provide sufficient spatial representation of the Tees dredge area. Due to an elevation of PCBs, material from Billingham Reach should be precluded from disposal at sea – this should be specified as a condition on the licence. The Hartlepool dredge area is sufficiently spatially represented, and the data do not indicate that material should be precluded from disposal at sea.

Joe Perry
Advisor (Sustainable Marine Management)

Quality Check	***Date***

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Charlotte Clarke	14/08/2019

Annex 1

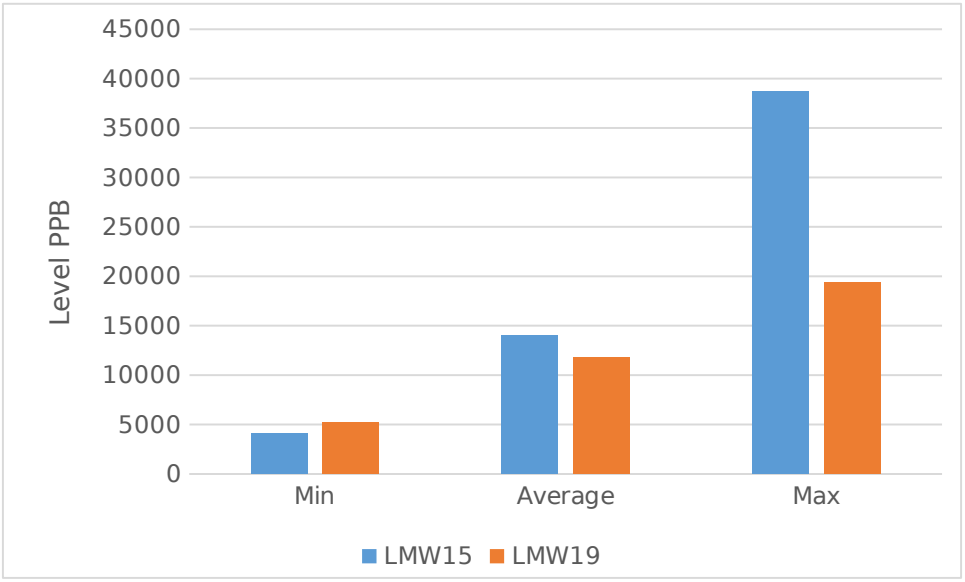

Figure 2. Bar chart detailing the low molecular weight PAH levels in 2015 and 2019 in the Tees dredge area. Detailed are the minimum value, average value and highest value

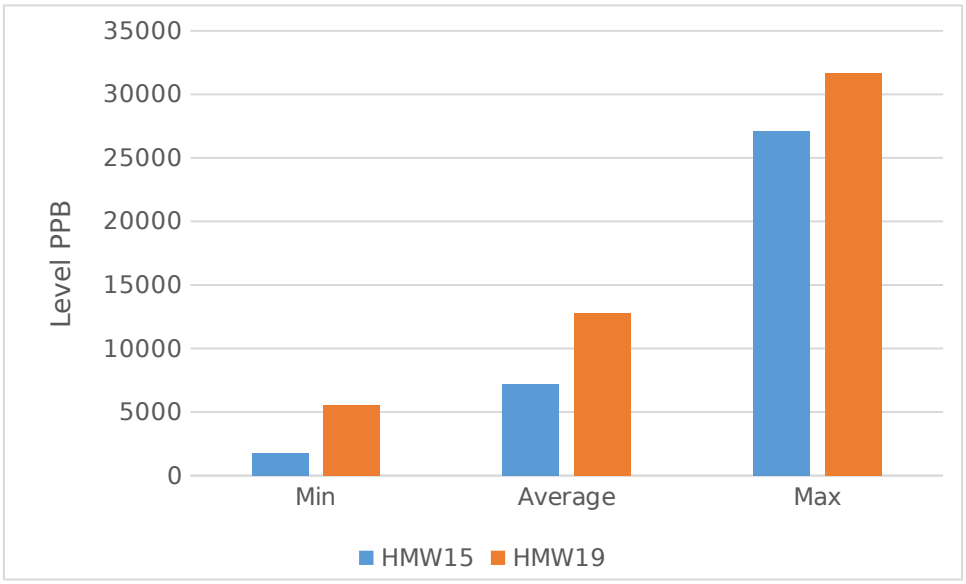

Figure 3.Bar chart detailing the high molecular weight PAH levels in 2015 and 2019 in the Tees dredge area. Detailed are the minimum value, average value and highest value

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