Centre for Environment Fisheries & Aquaculture Science

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MARINE AND COASTAL ACCESS ACT (2009). CONSULTATION TO DISCHARGE MID-LICENCE SAMPLING ROUND TWO FOR CONDITION 5.2.3 OF THE TEES AND HARTLEPOOL MAINTENANCE DISPOSAL LICENCE AT TEES ESTUARY, NORTH YORKSHIRE.
Reference Number: MLA/2015/00088/5 L/2015/00427/6

From: Joe Perry
Cefas, Lowestoft Laboratory
Date: 20th December 2021

To: Emma Shore - MMO (by e-mail/ via MCMS)

1. With reference to the above application for licence L/2015/00427/6 and your request for comments dated 19th November 2021, please find my comments below.

2. This minute is provided in response to your advisory request in relation to the above proposal in my capacity as scientific and technical advisor for sediment quality in relation to, and regulatory requirements for dredge and disposal operations. The response pertains to those areas of the pre-application/application/post-application request that are of relevance to this field. This minute does not provide specialist advice regarding benthic ecology, marine processes, fish and fisheries, shellfisheries, or underwater noise as, whilst these are within Cefas' remit, they are outside my area of specialism.

3. In providing this advice I have spent 7.5 hours of the allocated 7.5 hours by the MMO. I have booked my time to L/2015/00427/PC02.

Documents reviewed
4. MMO Results Template ("MMO Results Template MAR01178"), October and November 2021.

Description of the proposed works
5. As part of their statutory harbour authority responsibilities, PD Teesport conducts maintenance dredging of the Tees and Hartlepool to maintain navigable depths. They are licensed under L/2015/00427 to dispose of any such dredged material at Tees Bay A (TY160) offshore disposal site. Their licence is valid until 2025, and permits the annual disposal of 243,842 wet tonnes (187,570 m^3) of material from the Tees, and 45,128 wet tonnes (34,740 m^3) from Hartlepool. Condition 5.2.3 of the licence stipulates that mid-licence sediment sampling be conducted at 3-yearly intervals throughout the licence. The present consultation comprises the second of these mid-licence sampling intervals.

Responses to questions posed by the MMO (all comments are observations unless stated otherwise)
Q1. Are there any concerns regarding the mid-licence sampling?

Sampling
6. To support this application to discharge return 2 of condition 5.2.3, 20 samples have been taken from the Tees and Hartlepool dredge areas. All samples were analysed for trace metals, organotins, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and particle size (PSA). Analyses were conducted by Ocean Ecology and SOCOTEC, who are validated by the MMO for their respective analyses.

7. **Major comment:** This sampling mostly adheres to pre-application sampling advice (SAM/2020/00057; Joe Perry, 25th August 2020), however no data have been presented for polybrominated diphenyl ethers (PBDEs) which were recommended in the sample plan. My comments within this advice minute will not be final until these data are presented for review.

8. Further, the sample plan recommended only 8 samples, but the licence holder has presented data for 20. As these samples appear to be representative of the dredge areas, I will consider the results alongside the 8 recommended samples,

Dredged material quality

9. The trace metal results show most samples to be above Cefas Action Level 1 for most metal analytes. The extent of these elevations above AL1 is variable, with levels of chromium and nickel being only marginally above AL1, but lead being much closer to AL2 relatively. However, no result is so close to AL2 that I would recommend any additional mitigation or management, and so, the trace metal results do not preclude the material from continued disposal at sea.

10. The organotin results show some results to be above the respective limits of detection (LOD), however, no result meets either AL1 value (for di- and tributyltin). Therefore, the organotin results do not preclude the material from continued disposal at sea.

11. The PCB results show levels of most samples to be below the AL1 for both the ICES list of 7 PCB group and the sum 25 PCB group. Only two samples exceed the AL1 for both groups, however the elevations are much closer to AL1 than to AL2, and so, the PCB results do not preclude the material from continued disposal at sea.

12. The PAH results show most samples to be above the AL1. In absence of a defined AL2 for PAHs, Cefas utilise the Gorham-Test approach (1999; also in Long et al. 1995 and Long et al. 1998), which calculates the sum total of low- (LMW) and high- (HMW) molecular weight PAHs and compares these to observed effect-ranges. The effect-range low (ERL) can be viewed similarly to AL1, whilst the ERM can be viewed similarly to AL2.

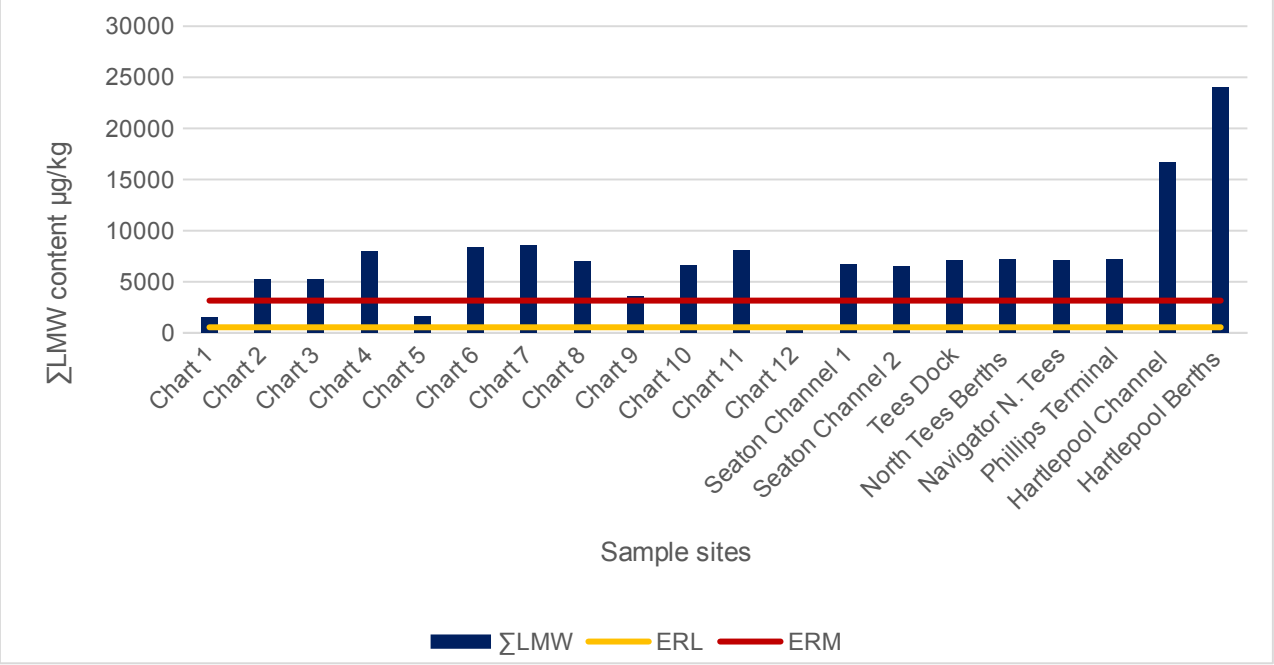

Figure 1. LMW PAH results

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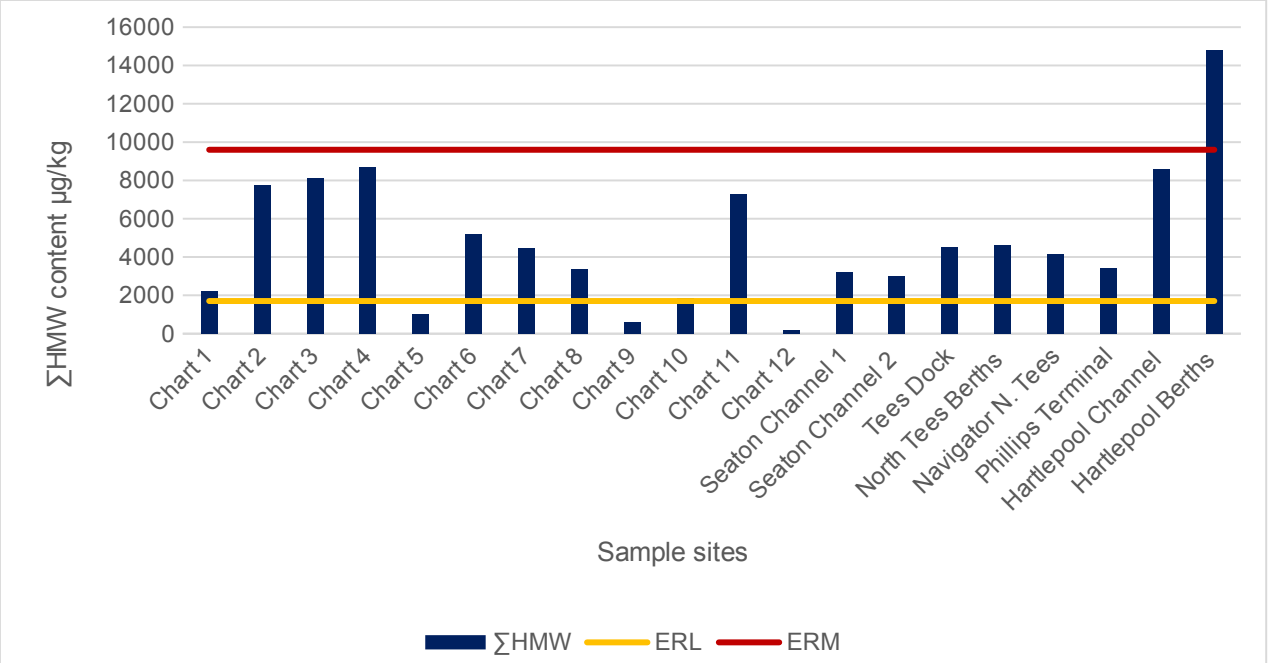

Figure 2. HMW PAH results

13. As detailed in Figure 2, the HMW PAH results are mostly above the ERL but below the ERM. Samples such as Charts 2, 3, 4 and 11, and Hartlepool Channel are much closer to the ERM than the ERL, whilst Hartlepool Berths exceeds the ERM. Figure 1 shows that, other than Charts 1, 5 and 12, all samples exceed the ERM for LMW PAHs, with Hartlepool Channel and Hartlepool Berths doing so by several orders of magnitude.

14. Viewed in isolation, these results would preclude material from continued disposal at sea. However, it is essential to consider the local and regional context. The Tees river, as with other North-east English rivers, has a documented history of specific industrial activity, which has led to a noticeable presence of both man-made and naturally occurring contaminants. Further, the general PAH footprint of the Tees typically skews more towards LMW PAHs than HMW PAHs, which is reflected in the results presented. Nonetheless, whilst considering local context is important, it is important consider this history holistically, rather than entirely discounting the results presented.

15. As this is a mid-licence dataset, in my opinion, the best way to determine the acceptability of these results is to compare them against previous results within the same licence. Two such datasets are available to do so: those from the application stage (MLP/2015/00094, sampled June 2015) and those from the 1st mid-licence sampling stage (SAM/2018/00050 and SAM/2018/00069, sampled in January and August 2019).

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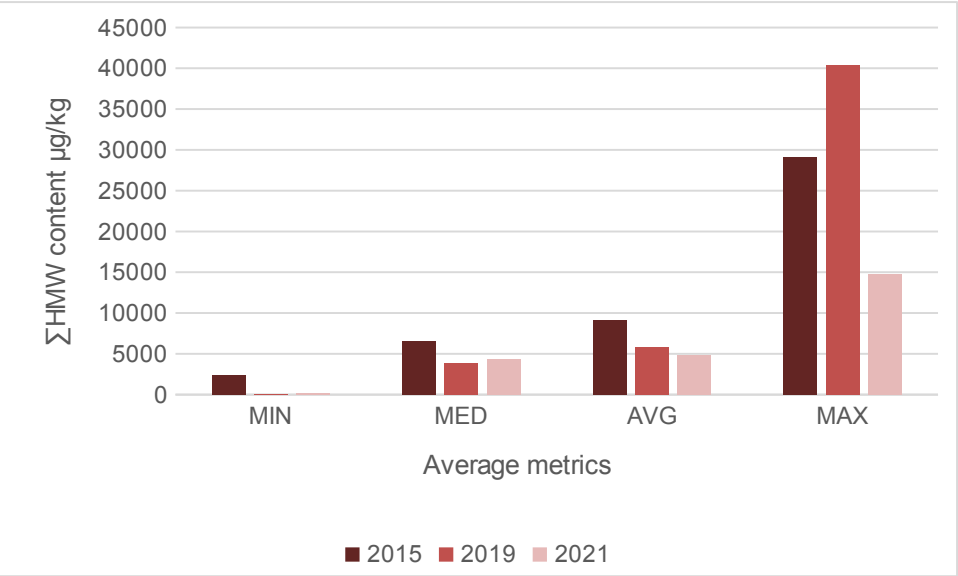

Figure 3. Barchart depicting HMW PAH data from 2015 - 2021.

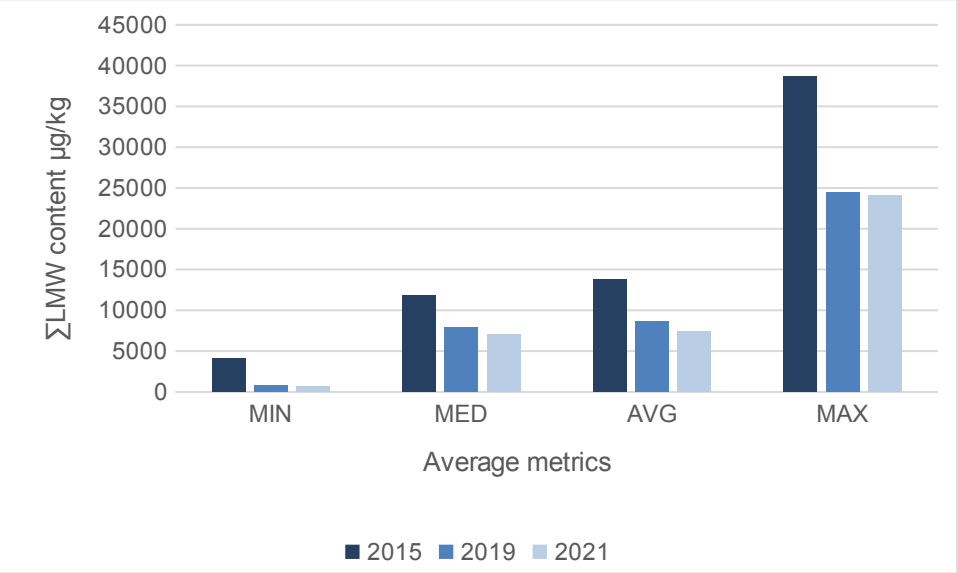

Figure 4. Barchart depicting LMW PAH data from 2015 - 2021.

16. Figures 3 and 4 show the minimum ("MIN"), median ("MED"), mean ("AVG") and maximum ("MAX") values (the "metrics") for each of the three datasets (2015 – the application stage; 2019 – the 1st interval; 2021 – the 2nd interval). This approach to comparing datasets allows a more comprehensive assessment of the spread of each dataset. As depicted, the 2021 show that most metrics are lower than those in both 2019 and 2015. The only metric that isn't, is the HMW median value (4,311 µg/kg), which is slightly higher than that of 2015 (3,914 µg/kg). However, the 2021 value is still below the initial 2015 value, and all median values remain below the HMW ERM.

17. Considering the results in both the local context of the Tees, and in comparison to previous years' data, the PAH results presented for this review do not preclude material from continued disposal at sea.

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Summary

18. The results presented are either below AL2 or consistent with previous years' data such that they do not preclude the material from continued disposal at sea, however, I recommend that the 2nd return of condition 5.2.3 is not discharged until PBDE data are presented for review, and approved by the MMO in line with the sampling recommended under SAM/2020/00057 (Joe Perry, 25th August 2020.

Joe Perry (Cefas)
Specialist Advisor (Evidence for Marine Management and Policy)

Quality Check	***Date***
Sylvia Blake	20/12/2021

References

Gorham-Test, C., Wade, T., Engle, V., Summers, K., & Hornig, E. (1999). Regional Environmental Monitoring and Assessment Program — Galveston Bay 1993. Proceedings, Galveston Bay Estuary Program, State of the Bay Symposium IV, January 28–29, Galveston, TX, 97–109.

Long, E.R., Field, L.J., and MacDonald, D.D. (1998). Predicting toxicity in marine sediments with numerical sediment quality guidelines. Environmental Toxicology and Chemistry. 17, 714-727

Long, E.E., MacDonald, D.D., Smith, S.L., and Calder, F.D. (1995). Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments. Environmental management, 19(1):81-97.

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