



MARINE AND COASTAL ACCESS ACT (2008). REQUEST FOR VARIATION OF THE TEES MAINTENANCE DREDGE LICENCE FOR A CAPITAL DREDGE AT TEES AND HARTLEPOOL, TEES ESTUARY.

Reference Number: MLA/2015/00088/5 L/2015/00427/5

From: Joe Perry
Cefas, Lowestoft Laboratory
Date: 29th March 2021
Tel: 01502 524564
E-mail:
regulatory_assessment@cefass.co.uk

To: Daniel Walker - MMO (by MCMS)

1. With reference to the above application and your request for comments dated 2nd March 2021, please find my advice 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 dredge and disposal. The response pertains to those areas of the pre-application request that are of relevance to this field. This minute does not provide specialist advice regarding benthic ecology, marine processes, shellfisheries, fisheries 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 of the allocated 7.5 hours, with time booked under MLA/2015/00088/5 (C8167B453).

Description of the proposed works

4. PD Teesport (PDT) hold marine licence L/2015/00427/4, which permits the disposal of 243,842 tonnes (~165,000 m³) from the Tees, and 42,128 tonnes (~30,058 m³) from Hartlepool, dredged under their statutory powers, at Tees Bay A (TY150) disposal site per year. Their licence was granted in 2015 and expires in 2025. The licence holder now proposes to undertake a dredge of the navigation channel within the Tees estuary to deepen the channel from a depth of an advertised 5.1m below Chart Datum (bCD) to a maximum depth of 5.7m bCD. The dredged material is to be disposed of within Tees Bay A.
5. The application does not specify the volume of material that the proposed dredge will comprise. At the sampling stage, the application in MCMS stated the total volumes to be: "100,000 m³ where 50,000 m³ are disposed offshore, and another 50,000 m³ are dredged by plough". This minute therefore uses these estimates for the assessment. If the applicant wish additional material for the deepening to be considered further information might be required.
6. In their application, PD Teesport states: "The existing depths within the Tees estuary are published by the Harbour Master and are as per those set out in the Tees MDP baseline document and its updates. As the licensed disposal quantity on L/2015/00427/4 would not be exceeded by the proposed disposal, in addition to the fact that the licence does not specify a maximum dredge depth and PDT does not require any other consents, there isn't anything on



the current licence to vary. PDT is however submitting this request in the interests of openness to ensure that the Marine Management Organisation (MMO) is aware of the proposed maintenance activity and the consequent change to the advertised dredged depth as shown on the Admiralty Chart. This approach directly aligns with the guidance received from the MMO (Adam Chumbley) during consultation in May 2020"

Sampling

7. Eight samples were collected from the surface (0m) and analysed for metals, organotins, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers (PBDEs) and particle size (PSA). Analyses were conducted by Ocean Ecology (for PSA), Cefas (for PBDEs) and SOCOTEC (all other analyses), all of whom are validated by the MMO for their respective analyses. This adheres to sampling advice SAM/2020/00057 (Joe Perry, 25th September 2020).

Metals, tins, PAHs and PCBs

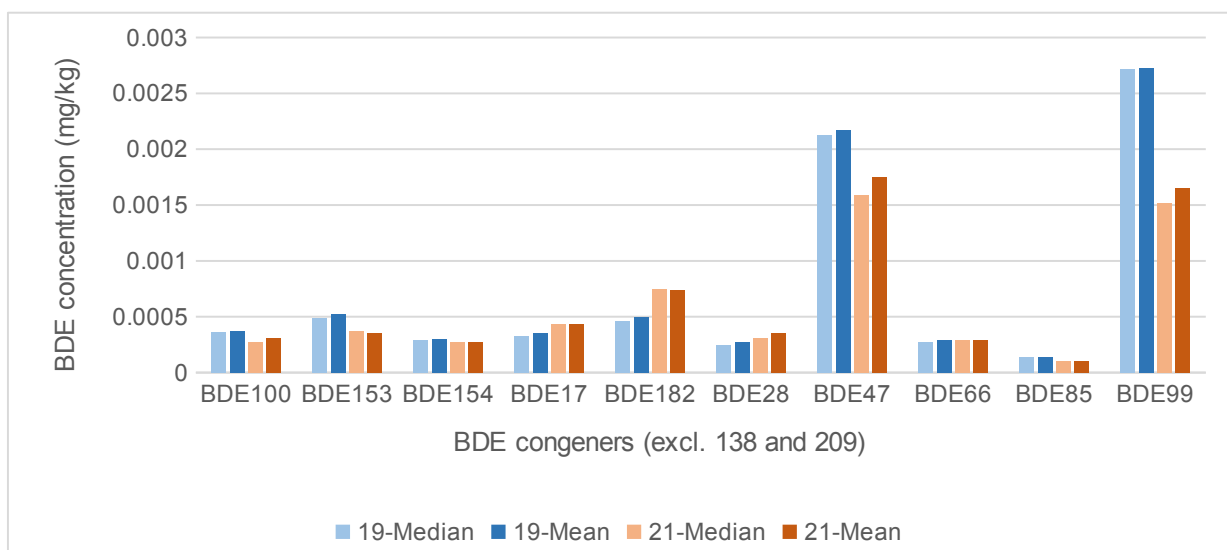
8. The results for the metals analysis show levels to be above Cefas Action Level 1 (AL1) for all analytes in all samples, except for arsenic, where only one sample had levels above AL1. Generally, levels are closer to AL1 than AL2 for all analytes except for lead, where levels are around the mid-point of the two action levels. Samples 5, 6 and 8 indicate higher levels of cadmium, chromium, lead and zinc, where individual values are closer to AL2 than AL1, but not to the extent that would preclude the material from disposal at sea.
9. The results for organotin analysis indicate levels to be below AL1 for both di- and tri-butyltin in all samples, and thus do not preclude material from disposal at sea.
10. The results for PAHs analysis showed levels to be above AL1 for most analytes in most samples. In absence of an agreed AL2 value for PAHs, Cefas utilise the Gorham-Test approach (Gorham-Test, 1998), which calculates the sum total of low- (LMW) and high-molecular weight (HMW) PAH content in each sample, then compares these values to observed effect-ranges. If a sum total value is around the effects-range low (ERL), then the risk is likely low, whilst if a sum total value is above the effects-range median (ERM), then the risk is likely unacceptable. These can, to an extent, be interpreted similarly to Cefas Action levels.
11. All sample results exceed the ERL for LMW PAHs, whilst only results of samples 5 and 6 exceed the ERL for HMW PAHs. This is broadly consistent with the general PAH contaminant footprint of the Tees, which, due to its historic associated industrial activities, exhibits LMW PAHs at higher concentrations than other UK rivers. In this analysis no sample exceeded the ERM for either LMW or HMW PAHs. In this regard, the results do not preclude the material from disposal at sea.
12. The PCB analysis results show that the AL1 for both the sum of ICES7 and the sum of 25 PCBs ($\Sigma 25$) are exceeded in all samples except for sample 3. For the $\Sigma 25$ PCBs, the results are closer to AL1 than AL2. In this regard, the levels indicated by the analysis do not preclude the material from disposal at sea.

PBDEs

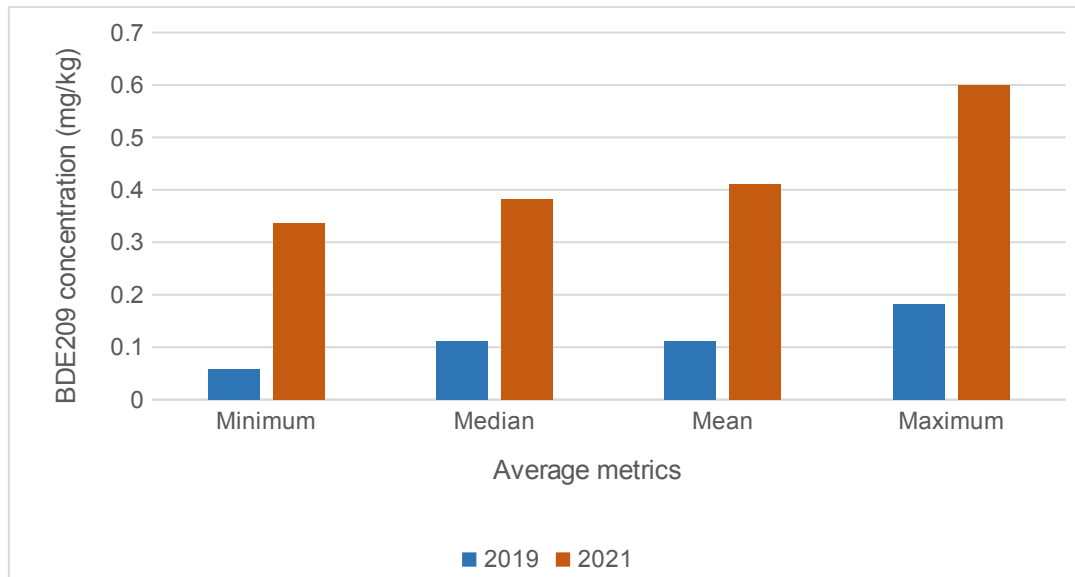
13. The PBDE results show levels below the limit of detection (LOD) for BDE-138 in all samples but sample 2, whilst levels are above the LOD values for all other BDE congeners. The results for BDE-209 are much higher than other congeners, but this is consistent with general expectations that BDE-209 is typically found at higher concentrations than others (Barber, J., *pers comm*, 11th June 2019). Currently there are no agreed ALs for BDE congeners. Due to the anthropogenic nature of BDE sources, background levels of BDEs in the environment

should effectively be as low as possible. However, as historic manufacture of these chemicals was based along the Tees, this area is known to exhibit BDE concentrations above the LOD in sediment and biota, often at higher concentrations than other parts of the UK (Boon et al., 2002; Law et al., 2006; Assunção et al., 2020). For this assessment, I will compare the results presented to previous results from the same area.

14. The most recent comparable data are those presented for the Mid-licence sampling consultation for PDT’s existing disposal licence (MLA/2015/00088/4; Joe Perry, 7th November 2019). These data will hereafter be referred to as the “2019” data in comparison to the “2021” data that were provided to support this application. Similar to the 2021 data, BDE-138 was largely below the LOD in the 2019 data and is thus of little to no concern, whilst the BDE-209 results were much higher than other BDE congeners, and so will be considered separately. The mean and median values for both the 2019 and 2021 data have been graphed in Figure 1 for all remaining BDE congeners, to compare the two datasets.



15. Figure 1 details that the 2021 BDE results are somewhat consistent with those from the 2019 dataset, with some marginal differences between the datasets for BDEs 100, 154, 17, 128, 66 and 85. BDE-182 is noticeably higher in the 2021 data than the 2019, but the difference is not particularly major. BDEs 47 and 99 are lower in the 2021 data than the 2019. Figure 1 generally indicates that levels of most BDE congeners are either consistent with, or marginally different from those observed in 2019. In this regard, these results do not preclude the material from disposal to sea.
16. Figure 2 depicts the minimum, median, mean and maximum values (“average metrics”) of the 2019 and 2021 data for BDE-209.



17. Figure 2 shows that BDE-209 levels in the 2021 dataset are much higher than those in the 2019 dataset, with each average 2021 metric being more than threefold higher than the 2019 metrics.
18. The last monitoring undertaken at Tees Bay A (TY150), (the licence holder's preferred disposal site) was conducted in 2014 as part of the MMO's annual disposal site monitoring programme (Bolam et al., 2014). The report cites that since 2008, there has been a general increase in BDE-209 concentrations at Tees Bay A (TY150). Monitoring included analysis of PBDEs and results observed for BDE-209 ranged from 0.00086 – 0.105 mg/kg.
19. Whilst there are presently no agreed ALs for PBDEs in England and Wales, the Defra Action Level Review report (Mason et al., 2020), proposes to set action levels for various BDE congeners. For BDE-209 AL1 proposed is 0.016 mg/kg, and 0.047 mg/kg for AL2. These proposed Action Levels were recommended by specialists with expert knowledge in analysis and interpretation of PBDE results, and took into consideration their effects in the marine environment and are therefore the best evidence available for this purpose. Analysis of BDE-209 for the 2021 data indicated that all samples exceeded the proposed ALs.
20. In light of the above points (17 – 20), my opinion is that the levels of BDE-209 recorded in the 2021 data pose a potentially unacceptable risk to the marine environment. However, the concentrations for all other BDE-congeners and analytes (i.e., metals, tins, PAHs and PCBs) observed do not preclude the material from disposal to sea. As the generally elevated presence of PBDEs in the Tees is documented with sampling data and published literature, and as we know that this elevated presence can be traced to historic industrial inputs, I am content at this time that the proposed works be licensed. However, I recommend that PBDEs analysis is continued for them to be fully assessed in future sampling campaigns in the Tees.

Responses to questions posed by the MMO (all comments are observations unless stated otherwise)

Question 1: Do you have any concerns regarding the variation request and/or sampling results?

21. The sampling results presented for this consultation do not preclude the proposed disposal of the capital dredge material to Tees Bay A (TY150). However, unlike other BDE concentrations the BDE-209 results show levels markedly higher in 2021 than levels observed in 2019. I recommend therefore that PBDEs continue to be examined in future sample and analysis campaigns, specifically at the next mid-licence sampling stage of licence L/2015/00427.

Question 2: Do you have any other comments to make?

22. The applicant's highlighting that: "*the licence does not specify a maximum dredge depth.*" The applicant should confirm the maintained depth that they will operate (e.g., point 4 above) to so that the nature of future disposal material to the disposal site can be considered in assessments appropriately.

Summary

23. I am content for a variation to the maintenance disposal licence (L/2015/00427/5) to allow 50,000 m³ to go to Tees Bay A (TY150). I note there is no change in the volume of material for the licence overall. The applicant should confirm the level at which the channel will be maintained for clarification, and understanding of the nature of the material at future maintenance dredge material assessments. Due to levels of PBDEs observed I recommend this analysis is included in all future sample and analysis campaigns in the Tees.

Joe Perry
Advisor (Sustainable Marine Management)

Quality Check	Date
Sylvia Blake	01/04/2021

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