



**MARINE AND COASTAL ACCESS ACT (2009). APPLICATION BY ABLE UK TO DISCHARGE
CONDITION 5.2.13 OF LICENCE L/2017/00012/4 FOR ABLE SEATON CAPITAL AND
MAINTENANCE DREDGE AT ABLE, TEES.**

Reference Number: MLA/2015/00334/4

From: Cefas, Lowestoft Laboratory

Date: 27th April 2020

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To: Laura Calvert – MMO (by MCMS)

1. With reference to the above application and your request for comments dated 14th March 2020, please find my advice below in my capacity as technical advisor for dredge and disposal.

Description of the proposed works

2. Deemed marine licence L/2017/00012/4 (application MLA/2015/00334/4) permits Able UK (the licence holder) to dredge and dispose of 695,000 m³ (834,000 wet tonnes as licensed, specific gravity SG = 1.2) of capital material from Able Seaton Port at Tees Bay C (TY160) over nine years (expires 2026). They are also permitted to dredge and dispose of 525,860 m³ (736,204 wet tonnes as licensed, SG= 1.4) of maintenance material from Seaton Channel at Tees Bay A (TY150) over nine years (expires 2026). A variation to the licence (L/2017/00012/4) now permits the applicant to also dredge and dispose of 160,000 m³ at Tees Bay C (TY160) over nine years (expires 2026). Condition 5.2.13 requires regular mid-year licence sampling requirements before year 3 and 6 to ensure material remains acceptable for sea disposal.

Sampling

3. 14 samples were collected from the licensed dredge area, specifically: 6 samples from Able Seaton Port, 5 samples from Seaton Channel and 3 samples from TERRC Basin, and were tested for trace metals and arsenic, organotins, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and polybrominated diphenyl ethers (PBDEs). Analyses were conducted by Ocean Ecology, SOCOTEC and Cefas, all of which are MMO-validated laboratories for their respective analyses. The sampling conducted adheres to Cefas pre-application sampling advice SAM/2019/00053.

Dredged material quality

4. The metals results show that other than cadmium, chromium and copper, where less than half of all sample results indicated elevated levels above Cefas Action Levels 1 (AL1), most sample results for all determinands showed elevated levels above AL1. When considering these elevated levels in respect to their respective AL2 values, it is clear that all results are considerably closer to AL1 than AL2. These results represent an overall slight decrease since the application stage (MLA/2015/00334). I have no major concerns as regards the metals content.



5. There was no elevation for either di- or tributyltin, both averaging well below the AL1 value. At the application stage, all results were recorded as below limit of detection (<0.002ppm: Cefas). Similarly, all but one result indicated levels of below the limit of detection (<0.005ppm: SOCOTEC), with one result recorded of 0.014ppm. I have no major concerns as regards the organotins content.
6. The PCB results show a range of values. There is a weak trend in that Pentachlorobiphenyls were more elevated than Hexachlorobiphenyls, specifically congeners CB101, CB110 and CB118, which contained the highest values of the PCB dataset. Unlike metals and tins, there are no Cefas Action Levels for individual PCB congeners, rather, two aggregated values are calculated from the dataset and action levels applied to their totals. These aggregated values are the sum total 25 PCB congeners (AL1 and AL2) and the ICES 7 PCB congeners (AL1 only). One sample exceeded AL1 for both values – Able Seaton Port location 6 – whilst all others were below AL1 for both indicators. It's clear that this elevation is very marginal, and so, I find no major cause for concern in the PCB results.
7. The PBDE results also show a range of values. BDE138 was recorded at 0.02 µg/kg in all samples, which I presume is or is around the limit of detection, whilst all other congeners were recorded at higher levels to varying extents. BDE209 (9 - 94 µg/kg), BDE47 (0.6 - 4.2 µg/kg) and BDE99 (0.6 – 4.9 µg/kg) were the most highly elevated congeners of the dataset. The remaining congeners ranged fairly evenly between 0.03 and 0.99 µg/kg. It is difficult to measure or compare these results to the Tees PBDE baseline, particularly within the licensed dredge area, as little PBDE analysis has been undertaken in the area. There are also no defined Cefas Action Levels for PBDEs, thus interpreting results must consider the local environment and historic context, whilst adopting a precautionary approach.
8. As PBDEs are a synthetic compound, we would prefer that their environmental concentrations were very low or as close to zero as possible. However, owing to historic industrial activity, the Tees has seen a trend of recorded PBDE levels that have generally been more elevated than other areas of the UK. As noted in previous Cefas advice (SAM/2019/00039 & SAM/2018/00069 & SAM/2018/00076/1, Jemma Lonsdale, 12th November 2019), the Tees river has exhibited some of the highest PBDE concentrations in the North Sea. This supports an adaptive approach, in that, whilst we would prefer that PBDE levels be as low as possible, there is notable evidence (though I hesitate to call it a trend) that the Tees is locally elevated in PBDE content, and that this should inform any licensing decision.
9. Cefas internal expert advice (Jon Barber) states that we see BDE209 at higher levels than other BDE congeners due its much higher limit of detection. Further, BDE47 and BDE99 are also identified as some of the most abundant and/or available congeners in the environment (UNEP, 2007). This gives some justification as to the distribution of results, particularly given the comparably very high levels of these congeners in comparison to the others. This assessment only goes so far, and so, it is necessary to compare the results to other applications in the area.
10. The most recent PBDE dataset for the Tees is from the Tees and Hartlepool maintenance dredge mid-licence consultation (MLA/2015/00088/4, November 2019) which indicates that the Able Seaton dataset is broadly consistent with PBDE levels in the Tees river, and does not exceed any of the levels recorded in 2019. As such, I'm content that this material is not high risk in terms of its PBDE content at this time. However, the MMO should note that whilst the levels are acceptable for this application, in broader terms, there is very little data to inform what is a realistic PBDE baseline for the Tees. As such, I recommend that future consultations carefully consider whether to request PBDE analyses.

11. Virtually all PAH congener levels indicated were elevated above AL1 in each sample, save for Perylene, Benzofluoranthene and Acenaphthylene, which were mostly elevated above AL1. In absence of a defined AL2 for PAH analysis, Cefas utilise the Gorham-Test method; an effects-range approach which calculates the sum total value of low- (LMW) and high-molecular weight (HMW) PAHs in each sample, and then compares these against observed effect-ranges. If a total value does not exceed the effects-range low (ERL), it can be considered low risk. If a total value meets or exceeds the effects-range median (ERM), it can be considered higher risk, with more likelihood of harm occurring.
12. All samples exceeded the ERL for both LMW and HMW PAHs. No sample exceeded the ERM for HMW PAHs, thus, I have no major concern in this regard. However, all samples exceeded the ERL for LMW PAHs, ranging from 4,295 to 10,091 µg/kg (LMW ERM = 3,160). This is not surprising given the location of the works; the North-east of England – particularly the Tees and the Tyne – typically record highly elevated levels of LMW PAHs, owing to historic industrial input of petrogenic compounds such as coal and tar. As such, Cefas takes a pragmatic approach in determining the level of risk in relation to PAHs in the North-east. Thus, it is important to compare these results to previous results and background concentrations.
13. For the Tees and Hartlepool Maintenance dredge consultation (MLA/2015/00088/4, 17th October 2019), Cefas produced a bar chart comparing the LMW PAH results from the mid-licence stage (2019) to the pre-application stage (2015) to assess any potential trend. This bar chart is displayed as Figure 1.

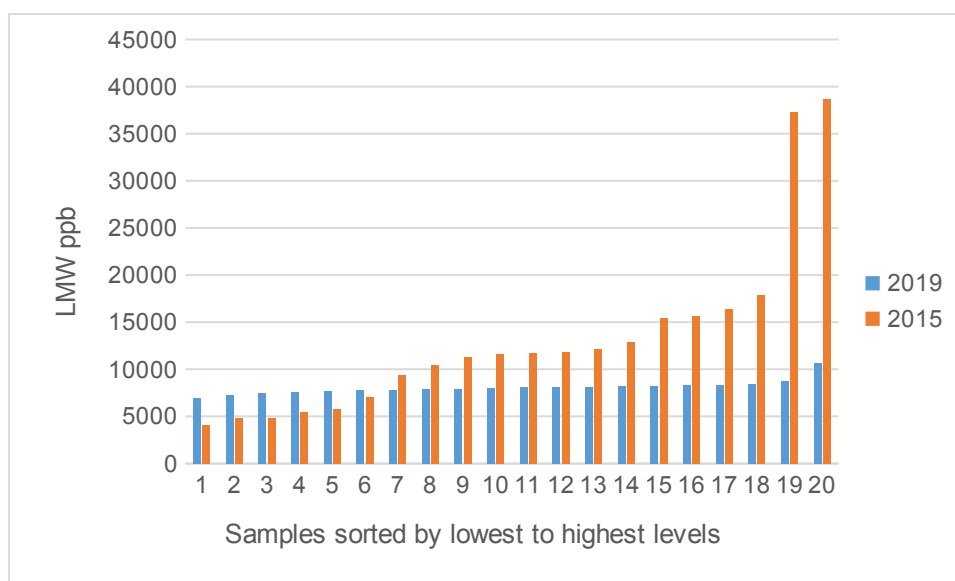


Figure 1. Bar chart comparing the low molecular weight PAH content from the MLA/2015/00088/4 pre-application stage to the MLA/2015/00088/4 mid-licence stage.

14. Comparing the Able Seaton results to Figure 1, it is clear that the Able Seaton results are similar in range to the mid-licence Tees and Hartlepool consultation, with Able Seaton having a lower minimum value and lower maximum value. Based on this comparison, it is my opinion that the sediment composition is sufficiently chemically similar to the surrounding area such that continuation of dredging and disposal would not pose an unacceptable risk at this time.

Summary

15. The evidence presented indicates no major cause for concern in continuing licensed activities at this time, though the MMO should note that, whilst PBDE content is consistent with other applications, there is not enough data to ascertain a relatively confident baseline level. Thus, there may be the need to request PBDE analysis in future, to ensure sufficient evidence is provided going forward.

Joe Perry
Advisor (Sustainable Marine Management)

Quality Check	Date
Sylvia Blake	27/04/2020

References

UNEP (2007). Persistent Organic Pollutants Review Committee of the Stockholm Convention. [Commercial Pentabromodiphenyl Ether: Risk Management Evaluation](#). United Nations Environment Programme, August 2007