



MARINE & COASTAL ACCESS ACT (2009). REVIEW OF THE REVISED SCHEME OF MONITORING AND APPLICANT'S RESPONSE TO CEFAS FISHERIES ADVISORS' COMMENTS FOR THE SOUTH BANK QUAY PROJECT (PHASE 1) ON THE RIVER TEES BY SOUTH TEES DEVELOPMENT CORPORATION

Reference Number: MLA/2020/00506/1 & L/2021/00333/1

From: Maria Gamaza
Cefas, Lowestoft Laboratory
Date: 16th June 2022

To: Fern Skeldon - MMO (via MCMS)
Cc: Fisheries Advice
Joe Perry - SEAL Case Officer

1. With reference to the above revised scheme of monitoring proposal and Applicant's response to Cefas fisheries advisors' comments for the South Bank Quay Project (Phase 1) by South Tees Development Corporation, and your request for comments dated 7th June 2022, 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 fish and fisheries. The response pertains to those areas of the post-application request that are of relevance to this field. This minute does not provide specialist advice regarding benthic ecology, marine processes, 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 3.75 hours of the allocated 3.75 hours by the MMO. I have booked my time to C8509POST72.

Documents reviewed

4. South Bank Phase 1 (MLA/2020/00506) Updated Scheme of Monitoring. Royal HaskoningDH UK Ltd. May 2022.
5. MLA/2020/00506/R8 - Response to Consultation Comments on Scheme of Monitoring. Royal HaskoningDH UK Ltd. 18 May 2022.

Background of this consultation

6. South Tees Development Limited (STDL) hold a marine licence (L/2021/00333/1) for Phase 1 of the South Bank Quay project (reference MLA/2020/00506). As part of the marine licence conditions, to monitor impacts on water quality during dredging, condition 5.2.7 states that "*dredging activities approved by this licence may not commence until such a time as a scheme of monitoring has been submitted to, and approved in writing by, the Marine Management Organisation. This must be submitted at least 10 weeks prior to the commencement of activities*". See **Annex 1** for further details.

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7. In March 2022, STLD submitted a scheme of monitoring proposal aiming to discharge condition 5.2.7 of the marine licence and, additionally, to explain their approach to monitoring prior to, during and post completion of dredging activities, should dredging be undertaken during July and August (as per Condition 5.2.9). Cefas fisheries advisors reviewed and provided comments on the scheme of monitoring¹. The applicant has now submitted a revised scheme of monitoring and response to previous comments raised by us.
8. It should be noted that in April 2022, STLD submitted a similar monitoring plan as an alternative mitigation to allow both maintenance and non-maintenance dredging to proceed during the months of July and August to which Cefas fisheries advisors reviewed and provided comments², but, to date, no further response has been received.

Responses to Questions posed by the MMO Case Officer. Note that all responses are observations unless otherwise stated.

Monitoring

MMO Question 1. Are the objectives of the monitoring set out appropriately within the report?

9. Yes, the objectives of the monitoring are clearly stated within the document provided for review. For instance, STDL is proposing to monitor water quality during dredging operations (as per condition 5.2.7 of the marine licence) by deploying four monitoring buoys as soon as possible in advance of the proposed dredging works. Instruments fixed to the monitoring buoy chains will monitor dissolved oxygen (DO), turbidity in Formazin Turbidity Unit (FTU), salinity and temperature at 1m above the estuary bed and 1m below the surface. Additionally, current data collected by PD Teesport (PDT) who have a water quality monitoring buoy located at Tees Dock is proposed to be used as supplementary data to support the baseline data collected by the four monitoring buoys to be installed.

MMO Question 2. Are the specifications for the survey appropriate and follow best practice where available?

10. As the monitoring is designed to monitor water quality (i.e., DO and FTU) I defer to the Environment Agency (EA) to provide comments on the appropriateness of DO monitoring specifications as this is beyond my expertise as a fisheries advisor.

MMO question 3. Is the report consistent with the advice provided on the monitoring specifications?

11. Please note that Cefas were not party to defining the scope of the proposed monitoring of DO and its inclusion in the marine licence conditions. As per comment 10 above, as monitoring of water quality falls outside my remit as fisheries advisor, I defer to the EA and Cefas colleagues with specialisms in coastal process and sediment plan monitoring to comment on the appropriateness of the proposed monitoring related to their expertise.
12. **Minor comment:** During previous consultation¹, Cefas fisheries advisors stated that, in the context of fish ecology receptors, the proposed monitoring was neither suitable or sufficient to prevent or reduce significant impacts to sensitive fish receptors. To this, STDL has now confirmed that no dredging (thus, no overlapping dredge campaigns between STDL and PDT) will be undertaken within July-August and the revised scheme of monitoring is now solely to satisfy condition 5.2.7, with regard to general water quality monitoring throughout the entire

¹ Advice reference MLA/2020/00506 L/2021/00333/1 dated 19th March 2022 by Maria Gamaza.

² Advice reference MLA/2020/00506 L/2021/00333/1 dated 1st April 2022 by Maria Gamaza.



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dredge campaign (see documents reviewed, point 5). I appreciate and thank the applicant for confirming that no dredging will be undertaken during the peak migratory season. Nonetheless, it should be noted that our previous recommendations for this¹ and nearby developments, were to avoiding piling and dredging works during peak migratory times for salmonids (i.e., May, July – August, please see **Annex 2** for further details). Therefore, outstanding concerns remain due to the importance of the fish receptors potentially being affected by the large volumes of dredging currently occurring in the Tees, either simultaneously or in sequence, for which the MMO may wish to liaise with other relevant experts in the field including representatives from Cefas Salmon and Freshwater team, SEAL advisors, Environment Agency as well as other developers in the Tees to agree on a suitable long-term monitoring programme and mitigation measures.

MMO Question 4. Are the specifications for the survey appropriate for addressing the objectives of the monitoring?

13. Generally, yes. I note that, following EA recommendations (documents reviewed, point 5), four monitoring locations have been selected:

- Site 1: Located outside the predicted zone of influence (to act as a control during dredging within the turning circle).
- Site 2: Located within the predicted plume associated with dredging in the turning circle.
- Site 3: Located within the predicted plume associated with dredging in the quay area.
- Site 4: Located outside of the predicted zone of influence (to act as a control during dredging within the quay area).

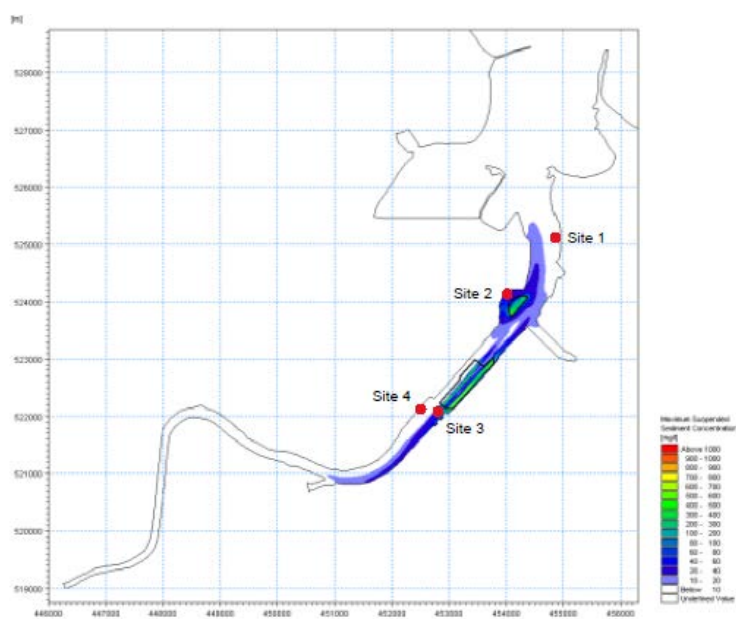


Figure 1. Proposed locations for monitoring buoys; extracted from figure 2.2 (documents reviewed, point 4).

14. I note that the Applicant has considered that a minimum one week of monitoring prior to commencement of dredging plus a minimum period of one week (seven consecutive days) after dredging operations have been completed, is adequate to illustrate a return to baseline conditions. In line with my previous comments, I defer to the EA and Cefas colleagues with specialisms in coastal process and sediment plan monitoring to comment on the appropriateness of the proposed monitoring related to their expertise.



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15. **Minor comment:** I note that all recorded data will be collated and summarised in a short report alongside dredging activity logs. This data will be shared with the EA upon completion of the licensed activities (no later than 10 working days). The MMO will also be sent a copy within seven days of the data being issued. The full report will be provided within two months of dredging activities being completed. In my opinion, the timescale from collecting to reporting the data to the regulator will not allow real time management decisions to be made in the event that recorded DO levels reach critical/lethal thresholds for fish species. However, although I am aware that the proposed monitoring aims to monitor general water quality during dredging, as per comments 10-12 above and in line with previous comments¹, it is Cefas fisheries advisors' opinion that the proposed monitoring is neither suitable nor sufficient to prevent or reduce significant impacts to sensitive fish receptors. Therefore, I defer to the EA and Cefas colleagues with specialisms in water quality and sediment plan monitoring to comment on the appropriateness of the proposed monitoring related to their expertise.

MMO Question 5. Is there a need to continue each piece of monitoring or can some parts be terminated?

16. Question not applicable at this stage. The document reviewed is in relation to monitoring being proposed.

MMO Question 6. Does the report suggest that further monitoring is required or the use of alternative approaches?

17. No. There is no information within the revised scheme of monitoring report suggesting further monitoring or alternative approaches.

MMO Question 7. What does the monitoring show? Are the identified impacts in line with those predicted in the ES?

18. Question not applicable at this stage. The document reviewed is in relation to monitoring being proposed.

MMO Question 8. Are there any anomalies identified by the monitoring and are these explained?

19. Not in the context of fish receptors and beyond the ones stated in comments 10-12 and 15.

MMO Question 9. Are any changes to the proposed monitoring programme needed?

20. Please refer to comments 12 and 15 as we have concerns regarding the suitability of the proposed monitoring to detect (real time) impacts on fish receptors as well as how the proposed monitoring would allow real time management decisions to be made in the event that recorded DO levels reach critical/lethal to fish species. Nonetheless, as per comment 10, as the monitoring is designed solely to monitor water quality (i.e., DO and FTU) and as this is beyond my expertise as a fisheries advisor, I defer to the Environment Agency (EA) to provide comments on the appropriateness of DO monitoring specifications and any changes needed.

MMO Question 10. Minor presentational comments if they affect the conclusions or overall confidence in the findings

21. None.

Maria Gamaza
Fisheries Regulatory Advisor

| Quality Check | Date |
|---------------|------------|
| Joe Perry | 20/06/2022 |



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Annex 1. Marine Licence conditions relevant to this consultation request

As part of the marine licence conditions two specific restrictions were included into the licence:

Condition 5.2.7 states that *'The dredging activities approved by this licence may not commence until such a time as a scheme of monitoring has been submitted to, and approved in writing by, the Marine Management Organisation. This must be submitted at least 10 weeks prior to the commencement of activities.'*

The scheme shall include:

- *Baseline assessment prior to commencement.*
- *Programme to monitor dissolved oxygen levels and turbidity (where appropriate)*
- *Programme of post-implementation monitoring. The scheme must be fully implemented and subsequently adhered to, in accordance with the timing/phasing arrangements embodied within the scheme, or any details as may be subsequently agreed, in writing by, the MMO.*

If it is deemed that any parts of this scheme are no longer required, written representation must be submitted to MMO for written confirmation prior to dredging works commencing.

Reason: To monitor impacts to water quality during dredging.

Condition 5.2.9 states that *'If permission is granted by the MMO to undertake dredging operation during 1st July to 31st August (inclusive), dissolved oxygen levels must be monitored prior to the dredging activity, as a minimum, monitored every hour during the dredging activity. If a drop of 1m/g of dissolved oxygen is observed, then the dredging activity must temporarily pause for a period of 6 hours (a tidal cycle) or until the reading returns to the previously observed level. Recorded data must be shared with the Environment Agency upon completion of the licensed activities, no later than 10 working days after their completion. The MMO must be sent a copy within 7 days of the data being issued.'*

Reason: To maintain, improve and develop all salmon, trout, lamprey, smelt and freshwater fisheries, under the Salmon and Freshwater Fisheries Act. 1975 (SSFA) as modified by the Marine and Coastal Access Act, 2009.'



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Annex 2. Rationale (evidence base) to support Cefas fisheries advisors' recommendations.

The Tees Estuary is recognised as the main salmon river in England and Wales with a Salmon Action Plan enforced by the Environment Agency³.

In particular, migrating species, such as salmonids, are known to exhibit avoidance reactions and move away from the vicinity of adverse sediment conditions, if refuge conditions are present (Sigler et al., 1984; Bash et al., 2001). This may increase exposure times to anthropogenic impacts (e.g., UWN from piling or SSC from dredging) whilst waiting in refuge areas. The effects of suspended sediment on swimming ability of juvenile brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*) were explored by Berli et al. (2014) who found both species experienced a decrease in swimming performance as turbidity increased due to impairment in the ability of the fish to utilise anaerobic metabolic pathways in high sediment environments. The authors concluded that the ability of salmonids to maintain swimming performance is hindered when fish are exposed to environmentally relevant, suspended sediment-generated turbidities.

The species known to migrate through Tees include salmon, sea trout, European eel, river lamprey and sea lamprey, all of which are listed under Section 41 of the NERC Act 2006 as species of principal importance. Latest EA data⁴ and studies undertaken in the River Tees (e.g., Moore & Potter, 2014), suggest the peak migration times for smolts (salmon and sea trout) to migrate to sea are late March/April peaking in May as the river warms up (Moore & Potter, 2014; Riley et al., 2002). Whereas adults migrating upstream peak times are July-August (inclusive).

It should be noted that whilst adults' salmonids might have some capacity to swim away back to sea or wait in refuge areas whilst waiting for more favourable conditions, smolts migrating downstream in their way to sea will not probably be able to move upstream again if facing an acoustic or physical barrier. Also, it should be considered transiting migration times through the estuary differ by species and so resident species will not go too far away from the source or noise/SSC; for example, piling driving more impact on sea trout as they reside in estuaries for longer periods of time.

Elevated concentrations of suspended sediment can have the following physical effects on all life stage of fish, particularly salmonids (Salmon & Trout Conservation, 2017) by:

- i. Damage to gills as a result of erosion of the mucus coating and abrasion of tissue (Redding and Schreck, 1982). The extent of damage depends on size and shape of particles, suspended sediment concentration, water velocity and gill dimensions (Appleby and Scarratt, 1989). Fish species have been found with increasing levels of deformities, eroded fins, lesions, tumours, gill flaring and 'coughing', all related to increasing SS in the water column (Berg, 1982; Schleiger, 2000).
- ii. A reduction in feeding and foraging effort by visual predators as a result of increased turbidity (Henley et al. (2000).
- iii. An increase in respiration and heart rate (Redding and Schreck, 1982) and altered blood physiology (Salmon & Trout Conservation, 2017).
- iv. An increase in energy expenditure and reserves resulting from the above impacts is likely to inhibit migration activities for species such as sea trout and river lamprey as they attempt to negotiate estuarine environments on their upstream migrations.
- v. Entrainment of demersal and benthic fish, fish eggs and larvae taken up through the drag head of the dredger.

³ <http://www.cpwf.co.uk/salmonstrategy%202009%2021.pdf>

<https://www.gov.uk/government/statistical-data-sets/river-tees-upstream-fish-counts>

⁴ <https://www.gov.uk/government/statistical-data-sets/river-tees-upstream-fish-counts>



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- vi. Potential disturbance caused by underwater noise from the dredging process.
- vii. Reduction in suitable spawning habitat and declines in egg/early life stage success (Salmon & Trout Conservation, 2017)

Settlement of sediment around areas of dredging and disposal can have the following impacts:

- i. Smothering of benthic foraging grounds by settlement of sediment.
- ii. Smothering of benthic eggs and larvae by settlement of sediment.
- iii. Reduced oxygen levels in water due to release of sediments containing high organic matter.
- iv. Exposure to contaminants contained within dredged sediment.
- v. Re-suspension of sediments causes nutrient enrichment promoting the formation of algal blooms, causing a reduction in water quality by decreasing oxygen levels or release of toxins.
- vi. Resuspension of sediments resulting from dredging can smother organisms and hinder growth, feeding and survival rates. (Gilmour 1999).

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