

Sediment sampling plan request

Future Port Talbot

Introduction

Future Port Talbot (FPT) is a proposal by Associated British Ports (ABP) to develop the port to support the transition to a net zero-carbon by providing the facilities to support the construction of Floating Offshore Wind (FLOW) developments. The proposals include construction of new quay walls and stone pads, quayside land reclamation, upgrade of the North Jetty and existing loading jetties, new pontoons and dredging for jack-up operations at Port Talbot. ABP is the Statutory Harbour Authority for Port Talbot.

Capital dredging is required for the Project within the harbour in the areas shown in Figure 1. The scheme design is still being developed and it is possible that the capital dredge may comprise all of the areas, or it may be limited to only one or two of the areas shown in Figure 1, or that the dredge may be carried out in phases. It is not currently anticipated that capital dredging would be required in any other locations (i.e. the Approach Channel, Afon Afan or impounded dock) and these areas are therefore excluded from this Sample Plan request. The exact capital dredge methodology has not yet been defined.



Figure 1. Proposed capital dredging for Future Port Talbot.

A sample plan has already been requested for the proposed work and was provided by NRW, in consultation with Cefas, on 24 July 2024 (Ref: SP2406). Since the provision of this sample plan, the proposed dredge areas and volumes have been updated. The purpose of this document is to provide the updated information on the proposed dredging and seek clarification on the requirements for sediment contamination surveys to inform the consenting process.

Dredge and disposal method

The capital dredging requirement for FPT is split into four areas, as shown in Figure 1 and Table 1. In the original sample plan request, dredging in three areas was required.

The dredging requirements for Area 1, to the north of the harbour, have increased since the original sample plan request. It now covers an area of 150,000 m² (increased from 121,000 m²), with an estimated dredge volume of 1,275,000 m³ (increased from 1,160,500 m³). The reason for the increased dredge area and volume is to allow for an additional small berth pocket within the area.

The dredging area and volume for Area 2, to the south of the harbour, has also increased since the original sample plan request. It now covers an area of 210,000 m² (increased from 175,000 m²)¹, with an estimated dredge volume of 2,510,000 m³ (increased from 2,367,500 m³). The reason for the increased dredge area and volume is to allow for an updated berthing layout on the south side of the tidal harbour (extending further west) and to increase the depth of the berth pocket for the commissioning and integration of berths (from -15 m Chart Datum (CD) to -16 mCD).

As well as the dredging within Area 2, there is also potential for additional dredging to be undertaken to the south of Area 2 (referred to as Area 2a in Table 1). The requirement for dredging within Area 2a will be dependent on the construction methodology for the quay wall. If required, the area measures 102,000 m², with a proposed dredge depth of -24.2 mCD, and an approximate dredge volume of 1,851,000 m³. The methodology has not yet been confirmed, and dredging may not be needed, but has been included in this sample plan request on a precautionary basis.

The third area comprises the area beneath the existing Tata Steel jetty, for which the dredging requirements remain the same as set out in the original sample plan request. This area covers 19,100 m² with a dredge volume of 46,550 m³ (as per the original sample plan request).

These figures represent maximum total dredge volumes for each area and include an allowance for the tolerances of the dredging equipment. The actual dredge volume, however, is anticipated to be less than the estimated maximum.

The depth of dredge varies over the existing bathymetry. Within Area 1, there will be a maximum deepening of around 17 m over a small area, with an average lowering of approximately 9 m. Within Area 2, there will be a maximum deepening of around 15 m, with an average lowering of approximately 11 m. Within 2a, there will be a maximum deepening of around 30 m over a small area, with an average lowering of approximately 27 m. The area beneath the Tata Steel jetty would require a maximum lowering of around 9 m over a small area, and an average lowering of approximately 2 m.

The majority of the dredge material *in situ* is likely to be silt and sand, with some firmer material. One of the options being considered is that material would be removed via backhoe. Some material may also be removed by trailer suction hopper dredger (TSHD) where possible, with dredged material likely

¹ Please note that in the original sample plan request the area of Area 2 (South area) was stated as 295,000 m², however, this was incorrect and should have been noted as 175,000 m² at time of writing.

to be disposed of at Swansea Bay (Outer) (LU130) or another nearby licensed site, subject to the dredge material being deemed suitable for disposal at sea by NRW.

Table 1. Proposed dredge volumes for FPT

Area	Plan area	Dredge depth	Dredge volume
Area 1 (North area)	150,000 m ²	-11.2 mCD, with berth pocket dredged to -16 mCD	1,275,000 m ³
Area 2 (South area)	210,000 m ²	Typically -11.2 mCD, with berth pocket dredged to -16 mCD	2,510,000 m ³
Area 2a (Potential additional dredge in south area to allow for construction methodology)	102,000 m ²	-24.2 mCD	1,851,000 m ³
Area under Tata Steel jetty	19,100 m ²	-11.2 mCD	46,550 m ³
Total			5,682,550 m³

Historic sampling

As part of ABP's existing maintenance dredge licence for Port Talbot Harbour (DML1946v2), interim sediment sampling has been undertaken within the harbour as per the conditions of the licence in 2016, 2019 and 2023.

A summary of sediment quality (chemical analysis) of surface samples from the maintenance dredge areas in 2023 is provided below, with full results presented in Appendix A.

Trace metal concentrations were typically below AL1 in most samples, with a few minor exceedances of AL1 for cadmium, nickel, and zinc. All trace metal concentrations were well below AL2. Organotin concentrations were all below the limit of detection. Total Hydrocarbon Content (THC) was low, mostly below or marginally exceeding 100 µg/kg. There are currently no ALs for THC.

Concentrations of polyaromatic hydrocarbons (PAHs) were either below AL1, or slightly above AL1. There is currently no AL2 for PAHs. The Gorham test was also used to consider the concentration of PAHs in sediment. The sum of low molecular weight (LMW) PAHs were either below or slightly above the Effects Range Low (ERL) concentration. All samples were well below the Effects Range Median (ERM) concentration. This was also the case for high molecular weight (HMW) PAHs. Further analysis (in the form of double-ratio plots) was undertaken to determine the chemical composition of the PAHs and their likely source. This analysis shows that the PAHs found in sediments in Port Talbot are coal derived. This is likely related to naturally occurring coal deposits; Coal Measures underlie most of Swansea Bay including the coastal strip from Black Pill, Swansea City Centre and the docks, Port Talbot, Margam and towards Kenfig.

Overall, recent sediment sampling shows that level of contamination within the harbour at Port Talbot is low.

Contamination survey sampling

NRW, in consultation with Cefas, provided a sediment sample plan on 24 July 2024 (SP2406). This recommended the following sampling effort (based on the dredge areas and volumes described in the original sample plan request):

- Area 1 (North); dredge depth 9.6 m – 4 sample stations, with samples taken at 2 m depth intervals at each site;
- Area 2 (South); dredge depth 8 m – 6 sample stations, with samples taken at 2 m depth intervals at each site; and
- Tata Steel Jetty – 3 sample stations, surface only (0 m).

The updated dredging proposals increase the dredge volume set out in the original sample plan request by approximately:

- 115,000 m³ in Area 1 (reflecting an increased dredge area by 29,000 m²);
- 142,500 m³ within Area 2 (reflecting an increased dredge area by 35,000 m²); and
- 1,851,000 m³ within Area 2a over an area of 102,000 m² (this may not be required but is included as a precaution at this stage).

ABP requests clarification on whether the increased dredge area and volumes requires additional sample stations to be taken in in each area. In any case samples will be taken at 2 m depth intervals, as previously advised, and these will be taken down to the lowest dredge depth at the location of each sample/borehole. On that basis, the number of sub-samples at each sample location may vary slightly depending on the existing seabed depths and proposed dredge depths.

The sample sites will be evenly spaced throughout each dredge area. Samples will be collected either from a surface grab (e.g., Van Veen grab) or from sampling cores where depth samples are required, using decontaminated stainless-steel sampling equipment. To maintain the integrity of the samples they will be frozen and remain in the freezer until they can be dispatched to the processing laboratory, in accordance with the MMO guidance for laboratories in physical and chemical determinands for sediment sampling.

The following information will be included with any samples (irrespective of the laboratory to be used for analysis):

- Clearly labelled samples;
- Completed sample position sheet, including the latitude and longitude (decimal degrees and the projection i.e., WGS84) of each location and the depth at which each sample is taken;
- Details of the method of sampling; and
- A map/chart detailing the sample locations.

The samples will be submitted to an NRW accredited laboratory. It is noted that the following analysis was recommended in SP2406 to support the application for dredging:

- Trace metals (including arsenic);
 - Organotins;
 - Polycyclic aromatic hydrocarbons (PAHs);
 - Polychlorinated biphenyls (PCBs);
 - Organochlorine pesticides (OCs);
 - Polybrominated diphenyl ethers (PBDEs);
 - Particle size analysis (PSA); and
- Optional:** Total Organic Carbon (TOC)*

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Appendix A

Table A.1. Concentrations of contaminants in the sediments in Port Talbot (Tidal Harbour) in 2023 with Cefas Action Levels

Contaminant	Units	Cefas Guideline Action Levels		Sample Concentration					
		AL1	AL 2	Tidal Harbour - A	Tidal Harbour - B	Tidal Harbour - C	Tidal Harbour - D	Tidal Harbour - E	Tidal Harbour - F
Arsenic	mg/kg	20	100	18.2	15.6	15.9	16.7	16.8	16.9
Cadmium	mg/kg	0.4	5	0.59	0.4	0.39	0.44	0.45	0.39
Chromium	mg/kg	40	400	35.5	33.4	33.6	33.7	35.4	36.2
Copper	mg/kg	40	400	29.2	25.8	24.6	26.4	27	25.8
Mercury	mg/kg	0.3	3	0.04	0.03	0.03	0.08	0.1	0.16
Nickle	mg/kg	20	200	40	29.5	29.8	29.4	31.1	31.4
Lead	mg/kg	50	500	53.6	49.8	49.4	51.1	51.9	51.8
Zinc	mg/kg	130	800	183	170	169	167	177	178
Dibutyltin (DBT)	mg/kg			<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Tributyltin (TBT)	mg/kg			<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Acenaphthene	µg/kg	100	-	28.7	27.8	26.9	31.7	28.2	54.3
Acenaphthylene	µg/kg	100	-	24.9	34.9	24.5	22.8	28.3	37.5
Anthracene	µg/kg	100	-	70.5	84	61.5	55.5	60.9	77.7
Benz(a)anthracene	µg/kg	100	-	203	249	203	157	191	304
Benzo(a)pyrene	µg/kg	100	-	252	297	263	197	240	373
Benzo(b)fluoranthene	µg/kg	100	-	318	372	331	249	314	463
Benzo(g,h,i)perylene	µg/kg	100	-	223	247	227	177	217	306
Benzo(e)pyrene	µg/kg	100	-	214	243	220	168	210	307
Benzo(k)fluoranthene	µg/kg	100	-	248	277	248	190	236	353
C1N	µg/kg	100	-	239	236	253	197	286	316

Contaminant	Units	Cefas Guideline Action Levels		Sample Concentration					
		AL1	AL 2	Tidal Harbour - A	Tidal Harbour - B	Tidal Harbour - C	Tidal Harbour - D	Tidal Harbour - E	Tidal Harbour - F
C1PHEN	µg/kg	100	-	236	243	239	195	253	316
C2N	µg/kg	100	-	199	203	219	171	242	275
C3N	µg/kg	100	-	136	143	154	126	175	197
Chrysene	µg/kg	100	-	291	366	290	234	282	433
Dibenz(a,h)anthracene	µg/kg	100	-	53.2	60.6	55.3	41.6	51.3	72.3
Fluoranthene	µg/kg	100	-	406	476	385	300	397	624
Fluorene	µg/kg	100	-	66.7	74.9	70.7	57.8	78.2	97.7
Indeno(123- c,d)pyrene	µg/kg	100	-	229	270	240	186	236	330
Napthalene	µg/kg	100	-	140	149	154	121	175	184
Perylene	µg/kg	100	-	79.9	84.4	69.7	59	66.9	104
Phenanthrene	µg/kg	100	-	259	268	240	194	254	347
Pyrene	µg/kg	100	-	324	358	308	245	305	488
Total Hydrocarbon Content (THC)				64.6	98.6	37.9	114	39.5	136
Key	Below AL1								
	Above AL1, Below AL2								
	Above AL2								

Table A.2. Concentrations of contaminants in the sediments in Port Talbot (Harbour Approach Channel) in 2023 with Cefas Action Levels

Contaminant	Units	Cefas Guideline Action Levels		Sample Concentration					
		AL1	AL 2	Harbour Approach Channel- G	Harbour Approach Channel - H	Harbour Approach Channel - I	Harbour Approach Channel - J	Harbour Approach Channel - K	Harbour Approach Channel - L
Arsenic	mg/kg	20	100	17.1	17.2	17.4	17.9	16.4	14.3
Cadmium	mg/kg	0.4	5	0.35	0.62	0.63	0.5	0.08	0.16
Chromium	mg/kg	40	400	36	38.7	35.2	38.3	33.7	32.4
Copper	mg/kg	40	400	27.1	25.2	28.1	27.3	25.1	21.6
Mercury	mg/kg	0.3	3	0.16	0.16	0.17	0.16	0.15	0.14
Nickle	mg/kg	20	200	30.6	31	30.7	32.1	29	28.5
Lead	mg/kg	50	500	54	55.9	53.9	56.9	50.9	44.7
Zinc	mg/kg	130	800	176	175	175	186	166	147
Dibutyltin (DBT)	mg/kg			<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Tributyltin (TBT)	mg/kg			<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Acenaphthene	µg/kg	100	-	22.8	25.7	29.3	32.9	24.8	16.6
Acenaphthylene	µg/kg	100	-	23.3	25.1	26.7	26.1	21.4	11.1
Anthracene	µg/kg	100	-	49.7	63.6	68.8	66.7	48.9	28.3
Benz(a)anthracene	µg/kg	100	-	167	186	212	247	139	79.9
Benzo(a)pyrene	µg/kg	100	-	211	232	264	294	172	97.1
Benzo(b)fluoranthene	µg/kg	100	-	271	309	331	371	234	126
Benzo(g,h,i)perylene	µg/kg	100	-	191	219	234	248	160	83.7
Benzo(e)pyrene	µg/kg	100	-	187	206	223	254	159	88
Benzo(k)fluoranthene	µg/kg	100	-	208	229	251	295	177	105
C1N	µg/kg	100	-	215	227	227	248	193	110
C1PHEN	µg/kg	100	-	200	225	226	264	188	97.7
C2N	µg/kg	100	-	185	196	190	213	166	88.8
C3N	µg/kg	100	-	130	140	132	154	129	62.4
Chrysene	µg/kg	100	-	254	275	307	354	208	117

Contaminant	Units	Cefas Guideline Action Levels		Sample Concentration					
		AL1	AL 2	Harbour Approach Channel- G	Harbour Approach Channel - H	Harbour Approach Channel - I	Harbour Approach Channel - J	Harbour Approach Channel - K	Harbour Approach Channel - L
Dibenz(a,h)anthracene	µg/kg	100	-	44.2	48.9	51.9	55.6	31.7	19.4
Fluoranthene	µg/kg	100	-	328	368	412	479	295	155
Fluorene	µg/kg	100	-	61.2	68.1	65.9	70.7	58.4	31.7
Indeno(123- c,d)pyrene	µg/kg	100	-	203	230	244	270	164	84.5
Napthalene	µg/kg	100	-	125	143	131	145	114	69.1
Perylene	µg/kg	100	-	59.9	69.7	81.4	87.7	54.8	28.2
Phenanthrene	µg/kg	100	-	210	230	251	276	192	101
Pyrene	µg/kg	100	-	258	286	328	378	228	124
Total Hydrocarbon Content (THC)				109	126	106	44.1	142	108
Key	Below AL1								
	Above AL1, Below AL2								
	Above AL2								

Table A.3. Concentrations of contaminants in the sediments in Port Talbot (Dock Approach Channel) in 2023 with Cefas Action Levels

Contaminant	Units	Cefas Guideline Action Levels		Sample Concentration			
		AL1	AL 2	Dock Approach Channel - M	Dock Approach Channel - N	Dock Approach Channel - O	Dock Approach Channel - P
Arsenic	mg/kg	20	100	11.1	10	14.6	15.4
Cadmium	mg/kg	0.4	5	0.04	<0.04	<0.04	0.16
Chromium	mg/kg	40	400	18.8	10	23.8	24.8
Copper	mg/kg	40	400	14.1	8.8	14.1	6.4
Mercury	mg/kg	0.3	3	0.11	0.09	0.1	0.12
Nickle	mg/kg	20	200	17.4	11.6	16.7	17.1
Lead	mg/kg	50	500	27.5	17.9	20.4	6.3
Zinc	mg/kg	130	800	95.9	82.3	81.6	89.1
Dibutyltin (DBT)	mg/kg			<LOD	<LOD	<LOD	<LOD
Tributyltin (TBT)	mg/kg			<LOD	<LOD	<LOD	<LOD
Acenaphthene	µg/kg	100	-	9.19	73.6	23.1	<5
Acenaphthylene	µg/kg	100	-	10.4	<5	24.8	<5
Anthracene	µg/kg	100	-	24.6	70.6	78.9	10.8
Benz(a)anthracene	µg/kg	100	-	69.4	236	231	22.7
Benzo(a)pyrene	µg/kg	100	-	86.5	296	215	22.6
Benzo(b)fluoranthene	µg/kg	100	-	109	242	254	22.5
Benzo(g,h,i)perylene	µg/kg	100	-	68.2	179	137	12.8
Benzo(e)pyrene	µg/kg	100	-	71.7	174	179	15.9
Benzo(k)fluoranthene	µg/kg	100	-	81.7	216	187	21.8
C1N	µg/kg	100	-	76.9	61.5	334	33.4
C1PHEN	µg/kg	100	-	74.4	156	468	31.9
C2N	µg/kg	100	-	62.7	47	250	23
C3N	µg/kg	100	-	44.3	36.9	205	13
Chrysene	µg/kg	100	-	99.2	278	314	28.9
Dibenz(a,h)anthracene	µg/kg	100	-	15.4	32.1	45.6	<5
Fluoranthene	µg/kg	100	-	129	719	384	57.7

Contaminant	Units	Cefas Guideline Action Levels		Sample Concentration			
		AL1	AL 2	Dock Approach Channel - M	Dock Approach Channel - N	Dock Approach Channel - O	Dock Approach Channel - P
Fluorene	µg/kg	100	-	22.8	46.6	84.6	8.31
Indeno(123-c,d)pyrene	µg/kg	100	-	72.8	173	134	13.5
Napthalene	µg/kg	100	-	49	42.7	251	17.2
Perylene	µg/kg	100	-	23.3	67	50	6.84
Phenanthrene	µg/kg	100	-	77	441	334	46.1
Pyrene	µg/kg	100	-	103	653	339	47.9
Total Hydrocarbon Content (THC)				76.5	354	665	22.4
Key	Below AL1						
	Above AL1, Below AL2						
	Above AL2						