

Supplementary Table 1. Sampling areas and site locations along the River Thames for the collection of water samples between May 2019-May and 2020

Area	Site	Address	GPS coordinates	Sample dates
Teddington	Teddington Lock	Teddington Lock Footbridge, London Borough of Richmond upon the Thames	51° 25' 47.856" N 0° 19' 20.24" W	May 2019 - May 2021
Westminster	Westminster Boating Base	Westminster Boating Base, 136 Grosvenor Road, London SW1V 3JY	51° 29' 6.579" N 0° 8' 4.182" W	May 2019 - March 2020
	Westminster – Close to Millennium Eye	The Queens Walk, Westminster, London SE1 7PB	51°30'05.3"N 0°07'11.6"W	April 2020 - May 2021
London Bridge - St Katherines	St Katherines Pier	River Thames, Shad Thames, London SE1 2NJ	51° 30' 22.504" N 0° 4' 24.324" W	May 2019 - May 2021
Limehouse	Limehouse	Ratcliff Cross Stairs, Jardine Road, London E1W 3WB	51° 30' 34.589" N 0° 2' 17.732" W	May 2019 - May 2021
North Woolwich	Tate and Lyle Sugar Factory	Factory Rd, Royal Docks, London E16 2EW	51°29'58.7" N 0°02'57.3" E	June 2019 - February 2020
	Barge Road - Slipway	The Old Bargehouse Drawdock and Causeway, Bargehouse Road, North Woolwich, E16 2NW	51°29'56.8" N 0°04'12.7" E	August 2020- May 2021
Barking Riverside	Barking Riverside	Dagenham Sunday Market, River Road, London IG11 0TD	51°30'51.1" N 0°06'31.7" E	June 2019-May 2021 Excluding the following months: April – June 2020 August - September 2020 December 2020 - January 2021
Tilbury	Tilbury Fort	The World's End, Fort Road, Tilbury RM18 7NR	51° 27' 6.276" N 0° 22' 13.364" E	May 2019 - May 2021 Excluding: April 2020
Southend-on-Sea	Southend on Sea	Lifeboat Station, Southend Pier,	51° 30' 54.705" N 0° 43' 18.069" E	May 2019 - May 2021

		Southend-on-Sea SS1 2EL		Excluding: April 2020
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Supplementary Table 2. Atmospheric control – Desk filters (Main study – monthly samples 2019-2021)

<u>Year</u>	<u>Date</u>	<u>Microplastic total (MPT)</u>
2019	20 th May	13 (3 blue, 9 black, 1 red)
	21 st May	8 (4 blue, 4 black)
	22 nd May	4 (1 blue, 3 black)
	3 rd June	3 (black)
	4 th June	0
	19 th June	6 (black)
	20 th June	0
	24 th June	3 (1 black fragment, 2 black fibres)
	25 th June	0
	3 rd July	2 (1 black fragment, 1 black fibre)
	6 th august	6 (black fibres)
	15 th august	6 (2 red fibres, 4 black fibres)
	2 nd September	0
	25 th September	0
	26 th September	1 (black fibre)
30 th September	3 (1 blue fibre, 1 black fibre, 1 red fibre)	

	2 nd October	2 (1 blue fibre, 1 black fibre)
	24 th October	2 (1Red fibre, 1 black fibre)
	25 th October	5 (2 red fibres, 3 black fibres)
	30 th October	0
	2 nd November	0
	4 th November	5 (4 black fibres, 1 red fibre)
	5 th November	7 (3 black fibres, 3 blue fibres, 1 red fibre)
	11 November	3 (1 red fibre,1 blue fibre,1 black fibre)
	21 st November	4 (3 black fibres, 1 red fibre)
	24 th November	0
	9 th December	2 (1 blue fibre, 1 red fibre)
	11 th December	6 (2 black fibres, 4 red fibres)
	19 th December	2 (black fibres)
2020	16 th January	0
	28 th January	9 (8 black frag, 1 black fibre)
	29 th January	0
	24 th February	0
	27 TH February	5

		(4 black fibres, 1 red fibre)
	28th July	4 (2 black fibres, 2 blue fibres)
	29th July	0
	30th July	3 (2 black fibres, 1 blue fibre)
	3rd August	0
	4th August	0
	5th August	1 (blue fibre)
	26th August	4 (2 blue fibres, 2 red fibres)
	27th August	1 (black fibre)
	2nd September	2 (black fibres)
	10th September	0
	26th October	5 (4 black fibres, 1 red fibre)
	27 October	1 (black fibre)
	3rd November	4 (blue fibres)
	11th November	1 (black fibre)
	18th November	0
	1st December	0
	2nd December	2 (1 black fibre, 1 blue fibre)
2021	26th April	16

		(4 blue fibres, 8 black fibres, 1 black fragment, 3 red fibres)
	29 th April	2 (2 black fibres)
	5 th May	2 (1 blue fibre, 1 red fibre)
	6 th May	1 (Black fragment)
	15 th June	2 (1 Black fibre, 1 red fibre)
	16 th June	4 (2 blue fibres, 2 red fibres)
	20 th June	1 (Black fibre)
	24 th June	2 (Black fibres)
	28 th June	6 (1 blue fibre, 5 black fibres)
	29 th June	4 (3 blue fibres, 1 red fibre)
	2 nd July	2 (1 blue fibre, 1 black fibre)
	6 th July	3 (1 Black fibre, 2 red fibres)
	7 th July	3 (2 black fibres, 1 blue fibre)
	8 th July	3 (Black fibre, blue fibre, red fibre)
	12 th July	1 (Black fibre)

	14 th July	3 (2 Blue fibres, 1 black fibre)
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Supplementary Table 3 Contamination controls conducted from 2019-2021, including distilled water kept in 500ml bottles, as well as controls to test for possible contamination via the sampling equipment (bucket and Lamotte horizontal water sampler).

Control	Microplastic per replicate	Mean MPT	Average length (mm)
Distilled water kept in 500mL bottles 21/11/19 – 14/6/21	0	0	-
	0		
	0		
500mL distilled water passed through the sampler	2 black fibres	1.3	1.57
	1 black particle		
	0		
	1 black fibre		
500mL distilled water passed over the rope (sampler)	3 blue fibre	3	2.89
	4 white fibre		
	2 black		
500mL distilled water rope soak (sampler)	1 black fibre	3.7	1.95
	1 blue fibre		
	1 red fibre		
	3 green fragments		
	3 white fibres		
1 blue fibre			
500mL distilled water inside the bucket	7 black fibres	5.67	4.63
	2 blue fibres		
	2 pink fibres		
	1 green fibre		
	2 pink fibres		
	1 black fibre		
	2 blue fibres		

	1 white fragment		
	0		
500mL distilled water passed over the rope (Bucket)	0	1	2
	1 black fibre		
	1 orange fibre		
	1 yellow fibre		
	0		
500mL distilled water rope soak (Bucket)	1 blue fibre	1.67	1.28
	1 black fragment		
	2 black fibres		
	1 transparent fibre		
	0		

Supplementary table 4 FTIR results for the eight areas sampled along the river Thames. Westminster (Westminster Boating Base and Westminster close to the Millennium eye) and North Woolwich (Tate and Lyle and Barge Road) have been made up of both the respected sites in that area

FTIR result	Teddington	Westminster	St Katherines	Limehouse	North Woolwich	Barking Riverside	Tilbury	Southend-on-Sea
Abs	2	3	4	0	8	2	2	3
alginic acid- biopolymer	2	0	0	1	0	0	0	1
alkyd varnish	2	1	1	0	0	1	1	1
Anthropogenic microfiber/particle	5	3	2	7	1	6	7	0
edterepolymer	1	0	0	0	0	0	0	1
ethylene vinyl alcohol	0	0	0	2	1	0	0	0
HDPE	2	0	0	0	0	0	0	0
malaic acid	0	0	0	0	0	0	0	0
Natrual	3	1	3	0	0	0	0	0
No Hit	24	19	18	21	9	24	44	17
Pcp	14	8	7	11	10	7	10	13
Pe	1	1	1	2	0	0	0	2
pe chlorinated	2	9	8	14	9	6	2	6
Pete	2	1	2	2	1	5	1	4

Pla	0	1	1	3	0	1	0	0
Poly (2,4,6 tribromostyrene)	0	0	0	1	1	0	0	1
Poly acrylic acid	0	0	0	1	0	0	0	2
poly vinyl butyral	1	0	0	0	0	0	0	1
polyacetal	1	0	0	0	0	0	0	1
polyamide	0	1	1	1	0	1	0	2
polybutadiene	0	1	1	0	0	0	1	0
polycarbonate	2	4	3	4	3	2	4	2
polyester	1	2	2	3	1	1	0	0
Polyethylene chlorosulfonated	0	1	0	0	1	1	1	2
Polyhydroxyl butyric acid	1	0	0	0	0	0	0	0
polyisoprene chlorinated	1	1	0	1	3	1	0	1
polyoxymethylene	0	0	0	0	0	0	1	0
Polyphenylene sulfide	2	4	1	3	4	4	3	2
polysulfone	3	0	0	0	1	0	0	0
polyurethane	1	1	1	0	3	0	2	2
Polyvinyl flouride	0	1	1	0	0	0	1	3
PP	10	6	2	7	2	2	2	4

PS	12	16	13	12	11	9	21	8
PTFE	4	5	4	2	3	2	3	1
pu foam	2	3	2	1	2	3	4	4
Pva	0	1	2	0	0	0	1	0
PVC	33	28	39	24	31	19	39	42
resin-dispersion	1	3	4	2	4	2	0	3
Rubber	0	3	5	2	2	5	8	2
styrene acrylonitrile	1	0	0	1	0	0	0	0
styrene allyl alcohol	1	0	0	0	0	0	0	0
Styrene ethylene butadiene	0	1	1	1	0	0	0	0
Vinylidene chloride	0	3	2	2	0	4	0	1
Zein purified	0	0	1	0	0	0	0	0

Supplementary Figure 1: Macroplastic observed between the opening of Limehouse harbour and the river Thames at high tide on multiple occasions A) 2nd November 2019 various plastics including a large water bottle and B) 6th November 2019 multiple water bottles



Supplementary Figure 2. Examples of Macroplastics found in water samples taken from the river Thames between 2019-2021; A) White fragment in Limehouse, October 2019 - Polypropylene, B) Purple fragment in St Katherines, October 2019 - Polyethylene chlorinated, C) Green rope in Teddington, August 2020 - Polyvinyl chloride, D) KitKat wrapper in Southend-on-Sea, May 2021 - Polyvinyl chloride, E) Blue fragment in Teddington, September 2020 – PU Foam, and F) Blue fibres (silly string)in St Katherines, December 2020 – Polychloroprene

